# USER'S GUIDE

*1-2-3 Release 5*

# Contents


## How to Use This Book . . . . . xi
Using this book with Help . . . . . xi
Conventions used in this book . . . . . xi

## 1 Before You Begin . . . . . 1
Checking your pack . . . . . 1
Disks . . . . . 1
Documentation . . . . . 1
System requirements . . . . . 2
Installing 1-2-3 . . . . . 3
To get Help while installing 1-2-3 . . . . . 3
Upgrading to 1-2-3 Release 5 . . . . . 3
To transfer data files to a directory . . . . . 4
To remove copy protection . . . . . 4
To erase old program files . . . . . 4
Installing 1-2-3 on a stand-alone computer . . . . 5
To install on a stand-alone computer . . . . . 5
Backing up your disks . . . . . 5
Installing 1-2-3 on a network node . . . . . 5
To install on a network node . . . . . 6
Returning to Install . . . . . 6
Reading product updates . . . . . 6

## 2 What's New for Upgraders . . . . . 7
Major new features . . . . . 7
A new look . . . . . 7
SmartMaster templates . . . . . 8
Displaying file information . . . . . 9
Charting . . . . . 9
Mapping . . . . . 10
Version Manager . . . . . 10
Defining data queries . . . . . 11
Using Lotus Approach with 1-2-3 . . . . . 11
Linking and embedding data . . . . . 12
Exchanging data with Lotus Notes . . . . . 13
Routing ranges . . . . . 13
Learning 1-2-3 . . . . . 13
Online Help . . . . . 14
New features . . . . . 14
@Functions . . . . . 22
New and enhanced @functions . . . . . 22
Enhanced @functions . . . . . 23
Macros . . . . . 24
New macro commands . . . . . 24
Enhanced macros . . . . . 28
New macro key names . . . . . 29
Customizing 1-2-3 . . . . . 30
Worksheet defaults . . . . . 30
Display defaults . . . . . 31
User settings . . . . . 31
Add-ins . . . . . 32

## 3 Starting and Ending 1-2-3 . . . . . 33
What is 1-2-3? . . . . . 33
Starting 1-2-3 . . . . . 33
To start 1-2-3 . . . . . 33
The control panel . . . . . 35
The title bar . . . . . 35
The main menu . . . . . 35
The edit line . . . . . 36
SmartIcons . . . . . 36
To use SmartIcons . . . . . 37
The Worksheet window . . . . . 37
Worksheet tabs . . . . . 39
The status bar . . . . . 39
Ending 1-2-3 . . . . . 40
To end a 1-2-3 session . . . . . 40

## 4 Managing the 1-2-3 Windows . . 41
What are the 1-2-3 windows? . . . . . 41
Using the mouse . . . . . 42
The mouse pointer . . . . . 42

Working with 1-2-3 windows . . . . . 44
Manipulating 1-2-3 windows . . . . . 45
To cascade windows . . . . . 46
To tile windows . . . . . 46

## 5 Using 1-2-3 Commands . . . . . 47

Using main menu commands . . . . . 47
To choose a main menu command . . . . . 48
Using 1-2-3 quick menus . . . . . 49
Using a dialog box . . . . . 50
Dialog box options . . . . . 51
Canceling a command . . . . . 52
Undoing an action . . . . . 53
Using 1-2-3 keys . . . . . 53
Using 1-2-3 Classic . . . . . 53

## 6 Worksheet Basics . . . . . 55

Opening a file . . . . . 55
SmartMaster templates . . . . . 55
To create a new file . . . . . 56
To open existing files . . . . . 57
Displaying file information . . . . . 58
Inserting and deleting worksheets . . . . . 59
To insert one worksheet at a time . . . . . 59
To insert a specified number of worksheets . . . . . 59
To delete a worksheet . . . . . 59
Naming worksheets . . . . . 60
To name a worksheet . . . . . 61
To delete a worksheet name . . . . . 61
To hide or show worksheet tabs . . . . . 61
Moving around a file . . . . . 62
Using the scroll bars . . . . . 62
Moving from one worksheet to another . . . 63
Moving to another file . . . . . 63
Viewing worksheets . . . . . 63
To view worksheets in perspective . . . . . 64
To zoom a worksheet . . . . . 64
Freezing rows and columns as titles . . . . . 64
To freeze rows and columns as titles . . . . . 65
Grouping worksheets . . . . . 65
To group worksheets . . . . . 66
To ungroup worksheets . . . . . 66
Saving a file . . . . . 66
To save a file . . . . . 67
Closing a file . . . . . 68
To close a file . . . . . 68

## 7 Selecting Worksheet Areas . . . . 69

Selecting a single cell . . . . . 69
To select a single cell . . . . . 69
Selecting a range . . . . . 70
To select a range . . . . . 70
To select a 3D range with the mouse . . . . . 71
To select a 3D range with the keyboard . . . 71
To reshape a selection . . . . . 72
Selecting a collection . . . . . 72
To select a collection . . . . . 72
Selecting columns and rows . . . . . 73
To select a single column or row . . . . . 73
To select a range of columns or rows . . . . . 73
To select a collection of columns or rows . . 74
Selecting worksheets . . . . . 74

## 8 Entering and Editing Data . . . . . 75

Entering data . . . . . 75
Entering numbers . . . . . 76
To enter numbers . . . . . 76
Entering text . . . . . 77
To enter text . . . . . 78
Entering dates and times . . . . . 78
To enter a date or time . . . . . 79
Entering data automatically . . . . . 80
To fill a range using drag-and-fill . . . . . 80
To fill a range by example . . . . . 81
Editing data . . . . . 82
To edit in a cell . . . . . 82
To edit in the contents box . . . . . 82
To delete data . . . . . 82
To find and replace text . . . . . 83
To check spelling . . . . . 84
Copying data . . . . . 86
To copy data by dragging . . . . . 86
To copy data using the Clipboard . . . . . 87
To copy data to adjacent cells . . . . . 87
Moving data . . . . . 88
To move data by dragging . . . . . 89
To move data using the Clipboard . . . . . 89
Inserting and deleting columns, rows, and ranges . . . . . 90
To insert columns or rows . . . . . 90
To delete columns or rows . . . . . 91
To insert a range . . . . . 91
To delete a range . . . . . 92

How inserting and deleting affects formulas . . . . . 92
Related Help topics . . . . . 92

## 9 Working with Range Names . . . 93

What is a range name? . . . . . 93
Naming ranges . . . . . 93
Range name guidelines . . . . . 94
To name a range by typing . . . . . 95
To name a range using adjacent labels . . . . 95
Using range names . . . . . 96
To go to and select a named range . . . . . 96
To enter a range name in a dialog box . . . . 96
To delete range names . . . . . 97

## 10 Calculating with Formulas . . . . 99

What is a formula? . . . . . 99
Types of formulas . . . . . 99
Building a formula . . . . . 101
Entering a formula . . . . . 101
Guidelines for entering formulas . . . . . 101
To enter a formula . . . . . 102
Some common errors in formulas . . . . . 103
Referring to cells and ranges in formulas . . . 104
To enter an address in a formula . . . . . 104
To enter a range name in a formula . . . . . 105
Referring to other files in formulas . . . . . 106
To refer to another file in a formula . . . . . 106
To update file links . . . . . 107
How 1-2-3 calculates a formula . . . . . 107
Overriding order of precedence . . . . . 108
Copying and moving formulas . . . . . 108
Copying formulas with relative references . . . . . 109
Copying formulas with absolute references . . . . . 109
Copying formulas with mixed references . . . . . 110
To copy and paste the results of a formula . . . . . 111
Moving formulas . . . . . 111
Recalculating formulas . . . . . 112
Analyzing formulas . . . . . 113
Why audit your worksheet? . . . . . 113

## 11 Calculating with @Functions . . . . . 115

What is an @function? . . . . . 115
@Function format . . . . . 115
Parts of an @function . . . . . 116
Argument types . . . . . 117
Entering an @function . . . . . 118
To enter an @function . . . . . 118
Customizing the @Function menu . . . . . 120
To add an @function to the menu . . . . . 120
To remove an @function from the menu . . 121
Learning about each @function . . . . . 121
To find information about an @function . . 121

## 12 Changing the Worksheet's Appearance . . . . . 123

Changing the appearance of numbers . . . . . 123
To change a worksheet's default number format . . . . . 124
To change the number format of a range or collection . . . . . 124
Changing font and attributes . . . . . 125
To change font and attributes . . . . . 125
Changing colors and patterns . . . . . 126
To change colors and patterns . . . . . 126
Adding borders and frames . . . . . 127
To add borders and frames . . . . . 128
Changing alignment . . . . . 129
To change alignment . . . . . 129
Copying and deleting styles . . . . . 130
To copy styles . . . . . 131
To delete styles . . . . . 131
Using named styles . . . . . 131
To define or delete named styles . . . . . 132
To apply a named style . . . . . 132
Changing column width . . . . . 132
To change a column by dragging . . . . . 133
To change more than one column by dragging . . . . . 133
To change columns to a specified width . . 133
Changing row height . . . . . 134
To change a row by dragging . . . . . 134

To change more than one row by dragging . . . . . 134
To change rows to a specified height . . . . 134
Hiding data . . . . . 135
To hide data in a range . . . . . 136
To hide columns or worksheets . . . . . 136
To display hidden columns or worksheets . . . . . 136
Related Help topics . . . . . 137

**13 Printing Data . . . . . 139**
Quick printing . . . . . 139
To print the current worksheet or file . . . . 140
To print a selected range or collection . . . . 140
To print charts or query tables only . . . . . 140
Print previewing . . . . . 141
To preview pages . . . . . 141
Adding headers and footers . . . . . 143
To add headers and footers . . . . . 144
Adding and removing page breaks . . . . . 145
To add a page break . . . . . 145
To remove a page break . . . . . 146
Adding print titles . . . . . 146
To add print titles . . . . . 147
Enhancing your printed pages . . . . . 148
To change print margins . . . . . 148
To center a selection for printing . . . . . 148
To shrink or enlarge printed data . . . . . 149
To hide or show worksheet elements in print . . . . . 150
To change page orientation . . . . . 150
Using named page settings . . . . . 150
To name and save page settings . . . . . 151
To use named page settings . . . . . 151
Related Help topics . . . . . 152

**14 Protecting Data . . . . . 153**
Sealing a file . . . . . 153
To seal a file . . . . . 153
To seal a file and leave specified ranges unprotected . . . . . 154
To reprotect ranges . . . . . 155
Preventing others from opening a file . . . . . 155
To limit access to a file . . . . . 155
To delete a password . . . . . 156

**15 Working with Charts and Maps . . . . . 157**
What is a chart? . . . . . 157
Creating a chart . . . . . 158
To create a chart . . . . . 159
Changing the chart type . . . . . 160
To change chart type . . . . . 160
To change the default chart type . . . . . 161
Types of charts . . . . . 162
Bar charts . . . . . 162
Line and area charts . . . . . 163
Mixed charts . . . . . 164
XY charts . . . . . 165
Pie charts . . . . . 165
HLCO charts . . . . . 165
Radar charts . . . . . 167
Choosing the best type of chart . . . . . 167
Naming and finding charts . . . . . 168
To rename a chart . . . . . 168
To find a chart . . . . . 168
Enhancing charts . . . . . 169
Related Help topics . . . . . 169
What is a map? . . . . . 170
Creating a map . . . . . 171
Changing a map . . . . . 172

**16 Working with Graphics . . . . . 173**
What are drawn objects? . . . . . 173
Creating lines, arcs, and arrows . . . . . 174
To create a line, arc, or arrow . . . . . 174
Creating rectangles and ellipses . . . . . 174
To create a rectangle or ellipse . . . . . 175
Creating polylines and polygons . . . . . 175
To create a polyline or polygon . . . . . 175
Drawing freehand . . . . . 176
To draw freehand . . . . . 176
Using text blocks . . . . . 176
To create a text block . . . . . 176
To edit text in a text block . . . . . 177
To change the appearance of a text block . . . . . 177
Bringing pictures into 1-2-3 . . . . . 177
To bring a picture into 1-2-3 . . . . . 177
Working with drawn objects . . . . . 178
To select drawn objects . . . . . 178

To copy drawn objects . . . . . 178
To move drawn objects in the current worksheet . . . . . 179
To move drawn objects to another worksheet or file . . . . . 179
To size drawn objects . . . . . 180
To delete drawn objects . . . . . 180
Enhancing drawn objects . . . . . 180
To change lines, edges, patterns, colors, or designer frames . . . . . 181
To arrange drawn objects . . . . . 181

## 17 Using Version Manager . . . . . 183

What are versions? . . . . . 183
What are scenarios? . . . . . 184
Working with Version Manager . . . . . 185
To move between the worksheet, Manager, and Index . . . . . 186
Using versions . . . . . 186
To create a version . . . . . 186
To display a version in the worksheet . . . . 187
To display more than one version . . . . . 188
To modify the version settings . . . . . 188
To update a version . . . . . 189
To delete a version . . . . . 189
To create a version report . . . . . 190
To sort versions . . . . . 191
Using scenarios . . . . . 192
To create a scenario . . . . . 192
To display a scenario . . . . . 193
To modify a scenario . . . . . 193
To delete a scenario . . . . . 194
Sharing versions and scenarios . . . . . 195
Sharing files using Lotus Notes . . . . . 195
Sharing files using a network . . . . . 197
Sharing files without a network . . . . . 198
Related Help topics . . . . . 200

## 18 Performing Statistical Analysis . . . . . 201

Calculating a frequency distribution . . . . . 201
Performing a regression analysis . . . . . 202
To perform a regression analysis . . . . . 202
To predict values for dependent variables . . . . . 203
Using data matrixes . . . . . 205
Inverting and multiplying 3D matrixes . . 206

## 19 Solving What-If Problems . . . 209

Using Backsolver . . . . . 209
Using what-if tables . . . . . 211
Solving a problem by changing one variable . . . . . 212
Solving a problem by changing two variables . . . . . 214
Solving a problem by changing three variables . . . . . 215
Charting what-if tables . . . . . 217

## 20 Using Solver . . . . . 219

What can Solver do? . . . . . 219
How Solver works . . . . . 221
Symbolic and numeric solving techniques . . . . . 221
Multiple worksheets and files . . . . . 222
Using Solver . . . . . 222
Setting up the constraints . . . . . 222
Determining adjustable cells . . . . . 223
Determining an optimal cell . . . . . 223
Viewing answers . . . . . 224
Solver examples . . . . . 224
Solver answers . . . . . 225
Saving answers . . . . . 225
Number of answers . . . . . 226
Avoiding negative answers . . . . . 226
Avoiding roundoff errors . . . . . 226
Solver reports . . . . . 227
Tips on using Solver . . . . . 227
Using @functions in Solver problems . . . . 227
Maximum problem size . . . . . 227
Related Help topics . . . . . 228

## 21 Working with 1-2-3 Databases 229

What is a 1-2-3 database table? . . . . . 229
Creating a 1-2-3 database table . . . . . 230
To create a 1-2-3 database table . . . . . 230
Using criteria . . . . . 231
Using @functions and formulas in criteria . . . . . 232
Using multiple criteria . . . . . 233
Changing relationships between criteria . . . . . 234
Using wildcard characters in criteria . . . . 235
Using query tables . . . . . 236
To create a query table . . . . . 236

To style a query table . . . . . 238
To set criteria for a query table . . . . . 238
To choose fields in a query table . . . . . 240
To rename a query table . . . . . 240
To sort records . . . . . 241
To refresh a query table . . . . . 242
To update a database table . . . . . 243
Using Lotus Approach with 1-2-3 databases 243
Finding records . . . . . 243
To find records . . . . . 244
Appending records to a database table . . . . . 245
To append records . . . . . 245
Deleting records from a database table . . . . . 245
To delete records . . . . . 245
Related Help topics . . . . . 246

**22 Working with External Databases . . . . . 247**

What's an external database table? . . . . . 247
Connecting to an external database table . . . 247
To connect to an external database table . 248
Creating an external database table . . . . . 250
To create an external database table . . . . . 250
Sending commands to an external database . 251
To send a command to an external database . . . . . 251
Disconnecting from an external database table . . . . . 252
To disconnect from an external database table . . . . . 252

**23 Customizing SmartIcons . . . . 253**

Working with sets of SmartIcons . . . . . 253
To select which set of SmartIcons to display . . . . . 253
To hide or show a set of SmartIcons . . . . . 254
To move the set of SmartIcons . . . . . 254
To move SmartIcons in a displayed set . . . 254
To size SmartIcons . . . . . 254
Creating and modifying sets of SmartIcons . 255
To create or modify sets of SmartIcons . . . 255
To delete a set of SmartIcons . . . . . 256
Customizing icons . . . . . 256
To change the appearance of an icon . . . . 256
To assign a macro to an icon . . . . . 258

**24 Using Macros to Automate Your Work . . . . . 259**

What is a macro? . . . . . 259
Summary of how to create a macro . . . . . 260
Planning a macro . . . . . 260
Deciding where to enter a macro . . . . . 261
Entering a macro with other data . . . . . 261
Entering a macro in a macro library . . . . . 261
Creating macro commands . . . . . 262
Macro command syntax . . . . . 262
Arguments . . . . . 263
Argument separators . . . . . 265
Rules for writing macro commands . . . . . 265
To write a macro command yourself . . . . . 267
Recording a macro . . . . . 268
To clear the Transcript window . . . . . 268
To record a macro . . . . . 268
To edit commands in the Transcript window . . . . . 269
To copy a recorded macro . . . . . 269
Naming a macro . . . . . 270
Working with a macro button . . . . . 270
To make a macro button from the Transcript window . . . . . 271
Running a macro . . . . . 272
To run an unnamed macro . . . . . 272
To run a backslash macro . . . . . 272
To run a range-name macro . . . . . 272
To run a macro with a button . . . . . 273
To run macro commands from the Transcript window . . . . . 273
Stopping a macro . . . . . 273
To stop a macro . . . . . 274
Recalculating during a macro . . . . . 274
To set recalculation . . . . . 275
Using autoexecute macros . . . . . 275
Debugging a macro . . . . . 276
To use Step mode and Trace . . . . . 277
Documenting a macro . . . . . 278
Saving a macro . . . . . 278
Learning about each macro . . . . . 279
To find information about a macro . . . . . 279
Related Help topics . . . . . 279

## 25 Using 1-2-3 with Other Applications . . . . . 281

Using mail . . . . . 281
To send mail from within 1-2-3 . . . . . 281
To attach a file to a mail message . . . . . 282
To insert a selection in a mail message . . . 282
To send a range . . . . . 282
Linking 1-2-3 with other applications . . . . . 283
Creating links . . . . . 284
To link to another application from a 1-2-3 file . . . . . 284
To link to a 1-2-3 file from another application . . . . . 286
Getting information about links . . . . . 286
To get information about DDE or OLE links . . . . . 286
To get information about DDE links . . . . . 287
Modifying links . . . . . 288
To edit a link . . . . . 288
To update, delete, or deactivate a link . . . 289
Embedding objects . . . . . 289
To embed a new object . . . . . 290
To embed an existing object . . . . . 290

## A Sharing Files and Macros . . . . 293

Opening and saving files . . . . . 293
Working with Release 2, 3, and 4 and Symphony files . . . . . 294
Working with Excel files . . . . . 295
What's different in files . . . . . 296
Sharing .WK1 and .WK3 files . . . . . 296
Sharing .WK1 files . . . . . 300
Using 1-2-3 for Windows Release 1 macros . . 302
Translating macro commands . . . . . 303
Selecting a directory . . . . . 304
Documenting translation problems . . . . . 304
Restrictions on translating macros . . . . . 304
To translate macros . . . . . 306
Using 1-2-3 for DOS macros . . . . . 307
To copy macros from an .MLB file . . . . . 307
What's different in macros . . . . . 308
Solving problems . . . . . 308
Using 1-2-3 for Macintosh macros . . . . . 310
Sharing macros with 1-2-3 for Macintosh . . . . . 311
Using Release 5 macros in other 1-2-3 releases . . . . . 313

## B Using Memory Efficiently . . . . . 315

How 1-2-3 allocates memory . . . . . 315
Regaining memory . . . . . 316
Structuring file contents efficiently . . . . . 316
Eliminating blocks of unusable memory . 317
Removing unneeded data and settings . . 317
Consolidating worksheets and files . . . . . 317
Removing unneeded formulas . . . . . 318
Turning off Undo . . . . . 318
Hard disk storage . . . . . 318

## C Using the Lotus Multibyte Character Set (LMBCS) . . . . . 319

Entering LMBCS characters . . . . . 319
To enter a character by using @CHAR . . . 319
To enter a character by using extended compose . . . . . 320
To enter a character by using a compose sequence . . . . . 320
LMBCS tables . . . . . 321
Group 0 . . . . . 321
Group 1 . . . . . 328

## Index . . . . . 333

# How to Use This Book

The *User's Guide* describes how to use Lotus® 1-2-3® Release 5 for Windows™. It includes basic concepts for most 1-2-3 features, step-by-step procedures for using 1-2-3, and information for upgraders. It also contains examples, tips, shortcuts using SmartIcons™, and illustrations of dialog boxes and worksheets.

Before reading the *User's Guide*, you should be familiar with basic Windows concepts and techniques. Chapter 4 in this book describes some common tasks, such as using the mouse and working with windows. Chapter 5 describes how to use menus and dialog boxes. For more information, refer to your Windows documentation. You can also use the Windows 3.1 online tutorial.

## Using this book with Help

The *User's Guide* and online Help complement each other. Help documents every 1-2-3 feature, @function, and macro command. It provides step-by-step descriptions, examples, and some conceptual information.

The *User's Guide* has step-by-step descriptions of most 1-2-3 tasks along with illustrations, examples, and basic concepts. For example, though the *User's Guide* doesn't describe individual @functions and macros, it's your primary source of information about how to enter and work with @functions and macros. Throughout the *User's Guide* and in the index, cross-references to Help tell you where to look for information about commands or features not described in the book.

## Conventions used in this book

The *User's Guide* uses the following conventions:

**Help** introduces a cross-reference to Help along with a topic you can search for in Help to find additional information. Look on the inside front cover of this book for a description of how to use Help.

*This is an example of a tip.*

Tips with additional information appear in italic in the margin.

SmartIcons next to a step in a procedure indicate that you can click the icon in place of the command in that step. If an icon in the documentation doesn't appear in your set of SmartIcons, you can add it using Tools SmartIcons. For more information, see Chapter 23.

**Shortcut** introduces additional ways of using SmartIcons to simplify your work.

**Note** introduces additional technical information about a command or procedure.

**Caution** introduces information essential to the safety of your data and software.

The following conventions indicate mouse and keyboard instructions in a procedure:

**Mouse** introduces a procedure using the mouse. When a procedure says to press a mouse button, use the left mouse button unless you specified left-handed use of the mouse in the Windows Control Panel. For more information, see your Windows documentation.

**Keyboard** introduces a procedure using the keyboard.

The following are conventions for function keys, key names, and information you type:

- Function keys appear in small capitals and are identified by the 1-2-3 key name. For example, **F1 (HELP)**.
- Key names separated by a + (plus sign) indicate that you hold down the first key, press the second key, and then release both keys. For example, **CTRL+Z**.
- Key names separated by a space indicate that you press the first key and release it, and then press the second key and release it. For example, **END HOME**.
- Information that you type appears in a different typeface. For example, Operating Expenses.
- Variables you must supply are in an italic font. For example, *filename*.
- [ ] (brackets) enclose optional arguments in @functions and macro commands; for example, [*password*]. When you type an optional argument, don't include the brackets.
- Words in **bold** are followed by a definition. For example, the **cell pointer** is the highlight indicating the current cell.

# 1 Before You Begin

This chapter lists what's in your 1-2-3 Release 5 for Windows package and the system requirements for using 1-2-3. It also describes how to install 1-2-3 for the first time, and how to return to Install later to add optional features or Help files you didn't install the first time.

## Checking your package

This section describes the disks and documentation in your package. If your package isn't complete, contact your computer dealer or supplier.

### Disks

Your package contains either one set of high-density 5.25" disks or one set of high-density 3.5" disks.

### Documentation

The following list describes the 1-2-3 documentation.

- The *User's Guide* is a task-oriented book that explains basic concepts, provides information about new features and compatibility issues, and gives you step-by-step procedures for the most common 1-2-3 tasks. It also tells you where to look in online Help for information not in the *User's Guide*.
- Online Help documents every 1-2-3 feature, menu command, and dialog box. Help is the primary source for detailed information about @functions and macros. See the back cover of this book to find out how to get Help, and choose Help Using Help from the 1-2-3 menu to learn more about Help's features.
- The online Tutorial provides hands-on lessons for using 1-2-3. To start the Tutorial, choose Help Tutorial. You can also start the Tutorial from the Welcome to 1-2-3 dialog box.
- The online Guided Tour explores basic concepts and enhanced features, such as charting, drawing, macros, working with databases, auditing your worksheets, and managing versions of your data. The Tour takes about 30 minutes to complete. To start

the tour, double-click the Guided Tour icon in the Lotus Applications window (or the group window that contains 1-2-3).

**Note** You must use a mouse and a 16-color VGA monitor or higher to view the Tour. If you have an SVGA monitor, set it to VGA using System Settings on the Options menu in your Windows setup.

If you don't want to keep the Guided Tour on your hard disk after viewing it, delete the Tour subdirectory and files. The tour is in \123R5W\library\tour.

- The READ.ME file contains information received after the documentation was printed. For more information, see "Reading product updates" on page 6.

## System requirements

To run 1-2-3, you need

- An 80386, or 80486-based computer certified for use with Microsoft® Windows 3.1 or later
- A color or grayscale VGA or better, or IBM® 8514 monitor

  If your computer displays VGA colors in grayscales, use Windows Setup to choose the appropriate color driver.
- A mouse (not required but strongly recommended)

  You must use the mouse to select individual chart elements, collections, or multiple drawn objects. You also need the mouse to draw, move, or size a drawn object; and to use SmartIcons, the status bar, and worksheet tabs.
- Microsoft Windows 3.1 or later
- DOS Version 3.30 or later
- 4 megabytes (MB) of random access memory (RAM); 6MB recommended when using Maps or Approach

  A 2MB or more swap file is recommended in 386 enhanced mode.
- Up to 23.7MB of available disk space on a stand-alone computer; 10.5MB or more on a laptop; 22.9MB on a network server; and 3.7MB on a network node

  The Guided Tour requires 3.3MB of additional disk space.

## Installing 1-2-3

If you're installing 1-2-3 on

- A stand-alone computer or a laptop computer, read "Installing 1-2-3 on a stand-alone computer" on page 5.
- A network node, read "Installing 1-2-3 on a network node," on page 5.
- A network server, start Install as described in "Installing 1-2-3 on a stand-alone computer" on page 5. When you are in Install, launch the *Network Administrator's Guide* when prompted. Once it is launched, you can print the guide from the File menu.

If you are upgrading, read "Upgrading to 1-2-3 Release 5" on this page.

### To get Help while installing 1-2-3

While you're installing 1-2-3, you can get Help about the options in each Install dialog box.

1. Choose Help:

   **Mouse** Click the Help button.

   **Keyboard** Press **TAB** to move the highlight to the Help button and press **ENTER**.

Install displays information about the options in the dialog box you're currently using.

## Upgrading to 1-2-3 Release 5

If you're upgrading from 1-2-3 for Windows Releases 4.0 or 4.01, you can install 1-2-3 Release 5 in the same directory as the previous release, or in a separate directory. If you are upgrading from another release of 1-2-3 for Windows, you need to install 1-2-3 Release 5 in a separate directory.

If you're installing 1-2-3 Release 5 for the first time, Install creates the required directories and automatically transfers the appropriate files.

If you're a 1-2-3 for DOS user and you plan to delete the Release 2 or Release 3 program files from your hard disk, but want to use your old data files in 1-2-3 Release 5, transfer the data files to a separate directory. After you transfer the data files and delete the old program files, you can change the default directory in 1-2-3 Release 5 to make your data files easier to find.

**Note** Check that your Release 5 installation is complete before you delete your previous version of 1-2-3.

**Help** To find out how to change the default directory, search on "Default directory" in Help.

If you're upgrading from 1-2-3 for DOS Release 2.0 or 2.01, remove the copy protection from any copy-protected program files before you delete them.

## To transfer data files to a directory

*You can also use the Windows File Manager to create a directory and copy files.*

1. At the DOS prompt, make the drive that contains your Release 2 or Release 3 files the current drive.
2. Type cd\ and press **ENTER**.
3. Type md\123data and press **ENTER**.
4. Type cd\ followed by the name of your Release 2 or Release 3 program directory and press **ENTER**.
5. Type copy *.w?? c:\123data and press **ENTER**. If your hard disk isn't configured as drive C, substitute the appropriate letter.
6. Repeat step 5 for each data file you want to save, substituting the appropriate file extension (for example, .FMT, .FM3, or .PIC) when you copy the files.

## To remove copy protection

If you're upgrading from 1-2-3 for DOS Release 2.0 or Release 2.01, and your program files are copy-protected, you must remove the copy protection before you can delete the files. If you're using Release 2.0, follow the COPYOFF or COPYHARD/U directions that came in your package. If you're using Release 2.01, start the Release 2.01 Install program, select Advanced Options, and then select Remove 1-2-3 from a Hard Disk.

## To erase old program files

*You can also use the Windows File Manager to delete files and directories.*

1. Make sure you're in the directory that contains your old 1-2-3 program files.
2. At the DOS prompt, type del *.* and press **ENTER**.
3. At the prompt, type y and press **ENTER**.
4. Type cd\ and press **ENTER**.
5. Type rd*dir_name*, where *dir_name* is the name of the directory that contained your old 1-2-3 program files and press **ENTER**.

## Installing 1-2-3 on a stand-alone computer

Before you can use 1-2-3, you must use the 1-2-3 Install program to transfer the program files to your hard disk. To install 1-2-3 for the first time or to return to Install later to add optional features or Help files you didn't install the first time, you must use the installation disks in your 1-2-3 package.

The directions that follow assume you're starting Install from a high-density A drive. If you start Install from a different drive, substitute the letter of that drive in the installation procedure. You must start Install from Windows 3.1 or later running with DOS version 3.30 or later.

### To install on a stand-alone computer

1. Insert the Install disk in drive A.
2. Open the Windows Program Manager.
3. Choose File Run.
4. Type a:\install in the Command Line text box.
5. Choose OK.

The Install program displays a series of dialog boxes that prompt you for information about what to install and how to install it. For example, an Install dialog box asks you to select the type of installation you want: All features, Minimum features, or Customize features.

### Backing up your disks

After installing 1-2-3, you may want to back up your 1-2-3 program disks. The disks you use for the backup must be the same size as your install disks. All backup disks must be high density.

To back up your disks, use the Disk Copy Disk command in the Windows File Manager. See your Windows documentation for information.

## Installing 1-2-3 on a network node

Before you can use 1-2-3, you must use the 1-2-3 Install program. To install 1-2-3 for the first time or to return to Install later to add optional features or Help files you didn't install the first time, you must connect to the 1-2-3 directory on your server. If you don't know how to connect to the 1-2-3 directory, ask your network administrator. You must start Install from Windows 3.1 or later running with DOS version 3.30 or later.

## To install on a network node

1. Open the Windows Program Manager.
2. Choose File Run.
3. Type *x*:*path*\install in the Command Line text box.

   *x*:*path* is the drive letter and path for the 1-2-3 directory on your server. For example, type n:\123R5w\install to start Install from a 1-2-3 directory named \123R5W on drive N.
4. Choose OK.

The Install program displays a series of dialog boxes that prompt you for information about what to install and how to install it. For example, an Install dialog box asks you to specify your personal directory.

## Returning to Install

When you install 1-2-3, you can choose not to install optional features and Help files. You can install them later by running Install and choosing the Customize features install.

## Reading product updates

The 1-2-3 README.TXT file contains notes for upgraders and network administrators, and information received after the documentation was printed. The Install program copies the README.TXT file to your 1-2-3 directory.

To open the README.TXT file, double-click the View Product Updates icon in the Lotus Applications window (or the group window that contains 1-2-3).

# 2 What's New for Upgraders

This chapter describes features that are new to you if you're upgrading from 1-2-3 for Windows or from 1-2-3 for DOS Release 2 or 3. The icon shown in the margin indicates features that are new or enhanced since 1-2-3 Release 4 for Windows.

5

**Note** In this chapter, Release 4 refers to 1-2-3 for Windows Releases 4.0 and 4.01. Release 1 refers to Windows Releases 1.0, 1.0a, and 1.1. Release 2 refers to DOS Releases 2.01, 2.2, 2.3, and 2.4. Release 3 refers to DOS Releases 3.0, 3.1, 3.1+, and 3.4.

For information on basic Windows techniques, see Chapter 4 of this book or your Windows documentation.

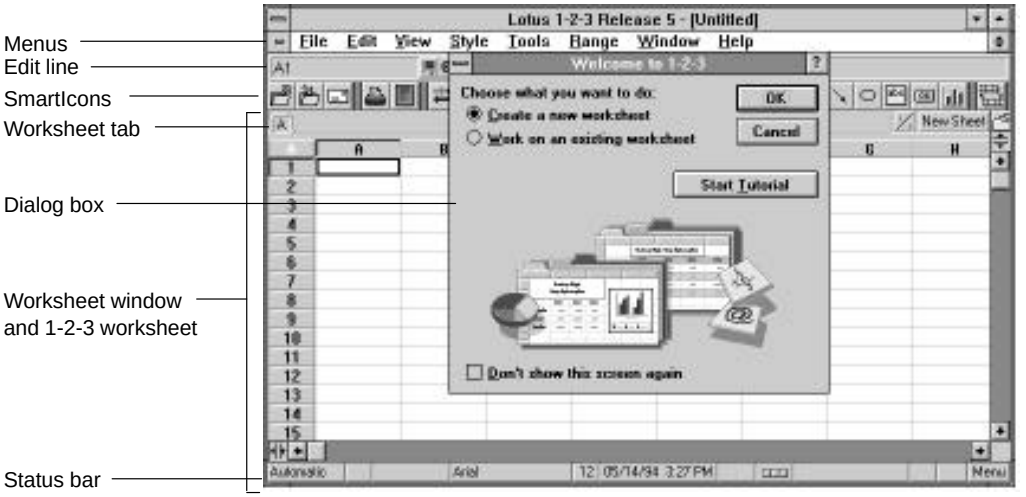
## Major new features

1-2-3 Release 5 offers many new features designed to improve individual and workgroup productivity. These features are a direct response to frequent customer requests and include greater ease of use, increased compatibility, and more ways to share data.

### A new look

When you start 1-2-3, you see the 1-2-3 window with a full-size Worksheet window inside it. The Welcome to 1-2-3 dialog box lets you choose whether to create a new worksheet, work on an existing file, or start the online Tutorial.

5




The 1-2-3 window is similar to the work area in Releases 2 and 3, and contains both familiar and new features. New graphical elements include the selection indicator, worksheet navigator, and @function selector in the edit line, and worksheet tabs that let you name and navigate quickly between worksheets. For more information about the parts of the 1-2-3 window, see Chapter 3.

1-2-3 gives you a variety of ways to perform tasks. You can

- Perform tasks quickly with new SmartIcons® and a dynamic status bar
- Choose commands from a streamlined, context-sensitive menu using the mouse or keyboard
- Pop up a quick menu with the most frequently used commands for the current selection with the right mouse button
- Use familiar Release 2 and 3 keystroke commands through 1-2-3 Classic®

For more information about using 1-2-3 commands, see Chapter 5.

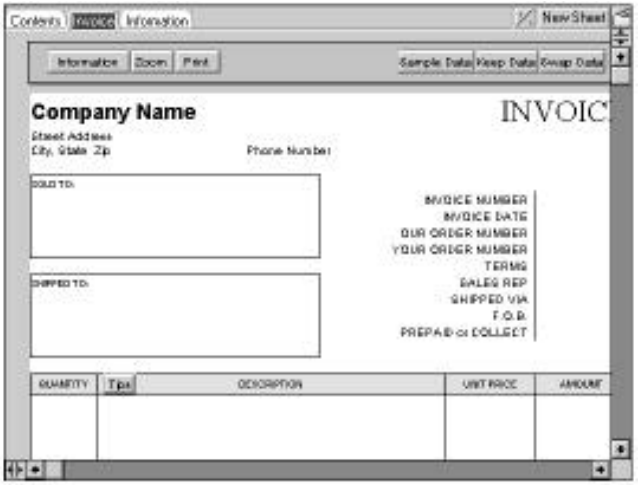
**Help** For information on 1-2-3 for DOS Release 3.1 command equivalents, search on "1-2-3 Classic" in Help.

## SmartMaster templates

5

When you create a worksheet file with File New, you can choose to start with either a plain worksheet or a SmartMaster™. 1-2-3 comes with a collection of SmartMaster templates that give you a head start on tasks such as creating budgets, tracking expenses, preparing invoices, and more. Because the formulas, macros, and formatting

are built in, you can focus on the data without having to develop the spreadsheet from scratch. You can also modify existing SmartMaster templates and then save them as new templates, or build a custom SmartMaster using the Shell SmartMaster template.




## Displaying file information

1-2-3 lets you keep track of useful information about files, whether you work on the files alone or share them with other people. In addition to assigning a title and subject, you can include keywords and comments.

5

1-2-3 also tracks who created and last modified each file, the file creation date, the date of the last revision, the total number of revisions, and the amount of time spent editing the file. To display information about the current file, choose File Doc Info.

**Help** For more information, search on "Document information" in Help.

## Charting

1-2-3 offers more intelligent charting — simply select the range or collection containing the data you want to plot, and then choose Tools Chart or click the icon shown here. You can position and size the chart right on the worksheet yourself, or let 1-2-3 do it for you. 1-2-3 uses cell contents in the range to automatically create the title, legend labels, and x-axis labels.

You can create as many charts as you want and edit them directly on the worksheet. Each chart can include up to 23 data sets. The default chart type is a bar chart.

When you select a chart, the Chart command appears in the menu. You use the Chart menu to set the data ranges you want to plot, change chart types, and enhance charts. For more information, see Chapter 15.

## Mapping

5

1-2-3 now lets you link worksheet data to geographical maps. For example, you can display worksheet information about each state in the United States by linking the data in the worksheet to a map of the United States.

Color legend.

**Help** For more information about mapping, search on "Maps" in Help.

## Version Manager

Version Manager is advanced "what-if" technology that lets you create and view different sets of data within the same named range and share that data with others in a workgroup. Because Version Manager tracks who creates or modifies data, when, and why, you can analyze and share data more productively.

For example, you can store high and low sales forecasts in a range called Sales and name them High Sales and Low Sales.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | North | South | East | West | Total |
| 2 | Sales | 250,000 | 175,000 | 210,000 | 225,000 | 860,000 |
| 3 | | | | | | |

High Sales version in Sales range

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | North | South | East | West | Total |
| 2 | Sales | 185,000 | 148,000 | 169,000 | 204,000 | 706,000 |
| 3 | | | | | | |

Low Sales version in the same range

You can group versions in different ranges to analyze their effect on your model. For example, you can group a High Sales version in

the Sales range with a Low Expenses version in another range named Expenses to create the Best Case scenario. To create a Worst Case scenario, group the Low Sales and High Expenses versions.

In addition, you can share data with a workgroup through Lotus Notes® or a network file server, or by merging versions and scenarios into a master file. For more information, see Chapter 17.

## Defining data queries

1-2-3 lets you query 1-2-3 and external database tables without creating criteria ranges or complex formulas. You simply select the database table you want to query and tell 1-2-3 how and where to display the results. 1-2-3 displays a copy of the selected records on the worksheet in a query table.

You define the criteria for a data query by selecting fields, operators, and values in a dialog box. 1-2-3 graphically shows the conditions that you want selected records to meet. As you add and delete criteria, 1-2-3 adds and deletes boxes. In the example below, the two boxes tell 1-2-3 to find records that contain either "Sales" or "Marketing" in the DEPT field.

Use the drop-down boxes to define criteria

Boxes that are side by side tell 1-2-3 to find records that meet either criterion

For more information about using query tables, see Chapter 21.

## Using Lotus Approach with 1-2-3

5

If you have Lotus Approach® Release 3.0 or later, you can use its powerful features to manage and analyze data contained in 1-2-3 database tables without leaving 1-2-3. You can create:

- Forms to view, enter, and edit the data, one record at a time
- Reports to organize, analyze, and present data
- Dynamic crosstabs to organize and summarize categories of data
- Mailing labels using predefined formats

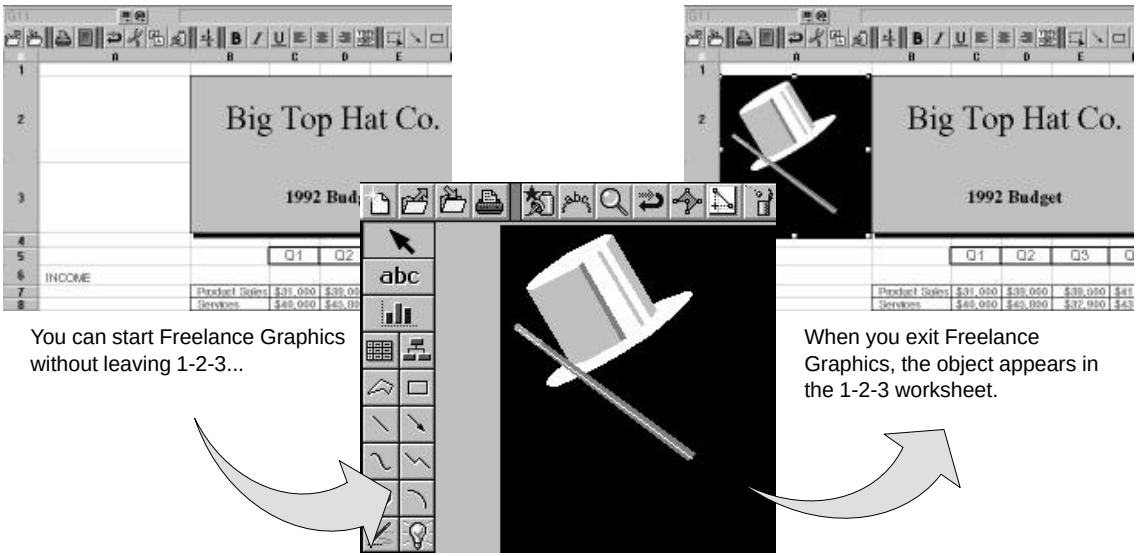
**Help** You can also use Approach to modify 1-2-3 database tables, and to sort and query data. For more information, search on "Lotus Approach" in Help.

## Linking and embedding data

You can use Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE) to create data links that let you share data between 1-2-3 and other Windows applications. Most DDE and OLE links are automatic — when the original data changes, the file that uses the data changes too. By simply double-clicking the cell containing the DDE or OLE link, you can start the other application from 1-2-3 and edit the original data.

You can also use OLE to create an embedded object. Embedding lets you incorporate data from one Windows application into a file in another Windows application.

Embedded objects are similar to DDE and OLE links. You can double-click an embedded object to start the other application and edit the original data from within the application that uses the data. For example, from within 1-2-3 you can start Freelance Graphics® for Windows Release 2.0 or later, create a logo, and embed it in the 1-2-3 file as shown below. To edit the logo later, you simply double-click it to return to Freelance Graphics from within 1-2-3. After you finish editing the logo, you return to 1-2-3. For more information, see Chapter 25.




You can start Freelance Graphics without leaving 1-2-3...

When you exit Freelance Graphics, the object appears in the 1-2-3 worksheet.

...and create a drawn object.

## Exchanging data with Lotus Notes

5

If you have Lotus Notes Release 3.0 or later, you can exchange data between 1-2-3 and Notes by embedding a worksheet object in a Notes form. This feature lets multiple users create spreadsheets using the same 1-2-3 worksheet as a template, and then store the spreadsheets in a Notes database. You can send information either from Notes to 1-2-3 or from 1-2-3 to Notes.

For example, you can create an expense report form in Notes that contains an embedded worksheet object. When you use the form to create a new expense report, you can launch 1-2-3 from the embedded worksheet object and enter the expense data directly in 1-2-3. After you complete the changes in the worksheet, you can update the Notes document. The information will appear in the Notes document and be stored in a Notes database.

**Help** For more information, search on "Notes/FX" in Help.

## Routing ranges

5

1-2-3 comes with enhanced electronic mail support that lets you send worksheet data to other users and incorporate their updates and comments.

You can send a range of data to a group of people simultaneously or route the range sequentially from one individual to the next in a mailing list. 1-2-3 also lets you choose whether to send the cell contents as formulas and values, or just as values.

When other users receive the worksheet data, they can enter their updates and include comments, if desired.

**Help** For more information about routing ranges, search on "Range routing" and select "Sending a Range" in Help.

## Learning 1-2-3

1-2-3 comes with an animated Guided Tour and an online Tutorial to get you up and running quickly. Take the Guided Tour to explore the graphical work area, hot features, charting, drawing, databases, and macros. Use the online Tutorial to learn the basics of 1-2-3. For more information, see Chapter 1.

5

You can learn what SmartIcons and menu commands do while you work in 1-2-3. To find out what SmartIcons do, point to an icon and hold the pointer in place. A short description of the icon appears next to the icon. To find out what a menu command does, highlight the command. A short description appears in the 1-2-3 title bar.

## Online Help

1-2-3 gives you comprehensive online Help on all commands, dialog boxes, messages, and 1-2-3 Classic. Help is also the primary source of information about @functions and macros. When you type @ or { and then press **F1 (HELP)**, you see general information on @functions or macros.

5

Help contains a category for the top ten most frequently performed spreadsheet tasks so you can find the information on the tasks that are most important to you. You can also print individual Help topics or entire sections for convenient reference.

Help appears in a separate window you can size, move, and keep open as you work.

For general information on Help, see the back cover of this book or Choose Help Using Help in 1-2-3.

## New features

This section briefly describes new features by category and tells you which Help topic or chapter and section in this book gives you more information about each feature. Some simple updates listed here do not have cross-references to more information.

## Working with files

| | *Feature* | *For more information, see* |
|---|---|---|
| 5 | Use SmartMaster templates to create financial statements, expense reports, time sheets, custom templates, and more. | Chapter 6, "SmartMaster templates" |
| | Create multiple-sheet files. | Chapter 6, "Inserting and deleting worksheets" |
| 5 | Name worksheets automatically. | Search on "Naming worksheets" in Help |
| | Use worksheet tabs to name and navigate through worksheets. | Chapter 6, "Naming worksheets" |
| 5 | Open multiple files at once. | Chapter 6, "To open existing files" |
| 5 | Open 1-2-3 for DOS Release 4 .WK3 files. | Appendix A |
| 5 | Open Excel sheet, workbook, and template files; save Excel sheet and workbook files. | Appendix A, "Working with Excel files" |
| 5 | Open and save dBASE® and Paradox® files. | Search on "dBASE files" or "Paradox files" in Help |
| 5 | Import text files more easily. | Search on "Text files" in Help and choose "Working with text files in 1-2-3" |
| | Open and combine different file types with one command. | Search on "Combining files" in Help |
| 5 | Have up to 32 files open at the same time. | Chapter 6, "Opening a file" |
| | Open recently used files quickly by choosing them from the bottom of the File menu. | Chapter 6, "To open existing files" |
| | View three worksheets at the same time. | Chapter 6, "Viewing worksheets" |
| | Protect all worksheets in a file. | Chapter 14, "Sealing a file" |
| 5 | Save and display information about a 1-2-3 file including file comments, keywords, and revision history. | Chapter 6, "Displaying file information" |
| | Save changes automatically to active 1-2-3 files at regular intervals. | Search on "Autosave" in Help |
| | Save formatting with data in a single .WK4 file. | Chapter 6, "Saving a file" |

## Selecting worksheet areas

| | *Feature* | *For more information, see* |
|---|---|---|
| | Select a range before *or* after you choose a command. | Chapter 7, "Selecting a range" |
| | Use the mouse or keyboard to select a 3D range. | Chapter 7, "Selecting a range" |
| 5 | See range names in the selection indicator instead of the range addresses, when you select named ranges. | Chapter 3, "The edit line" |
| | Extend or shrink a selected range. | Chapter 7, "To reshape a selection" |
| | Select a collection that contains two or more ranges. | Chapter 7, "Selecting a collection" |
| | Select columns, rows, or worksheets quickly with the mouse. | Chapter 7, "Selecting columns and rows," "Selecting worksheets" |

## Entering and editing data

| | *Feature* | *For more information, see* |
|---|---|---|
| | Enter and edit data directly in a cell. | Chapter 8, "Entering data," "Editing data" |
| 5 | Enter a frequently used sequence of data in a range by dragging with the mouse. | Chapter 8, "Entering data automatically" |
| | Type = (equal sign) to start entering a formula in a cell. | Chapter 10, "To enter a formula" |
| | Add a note to a value or formula. | Chapter 8, "Entering numbers" |
| | Select the interval you want when you choose Range Fill to enter a sequence of dates or times. | Search on "Filling ranges with values" in Help |
| | Reverse the effect of your last command or action. | Chapter 5, "Undoing an action" |
| | Find and correct misspelled and duplicate words. | Chapter 8, "To check spelling" |
| | Find and replace specific characters. | Chapter 8, "To find and replace text" |

## Copying, moving, and deleting data

| | *Feature* | *For more information, see* |
|---|---|---|
| 5 | Copy and move data on the worksheet, and across worksheets, files, and applications by dragging with the mouse. | Search on "Drag-and-drop" in Help |
| | Copy data to the Clipboard and then paste it more than once, and to more than one location. | Chapter 8, "Copying data" |
| 5 | Paste data from the Clipboard quickly, by pressing **ENTER**. | Chapter 8, "To copy data using the Clipboard" |
| | Paste data with or without its styling, or replace formulas with their current values. | Search on "Pasting data" in Help and then choose "Edit Paste Special" |
| | Copy part of a selected range up, down, left, right, front or back to the rest of the range. | Chapter 8, "To copy data to adjacent cells" |
| | Move data by cutting it to the Clipboard and then pasting it where you want. | Chapter 8, "Moving data" |
| 5 | Delete cell contents in a selected range by dragging with the mouse. | Search on "Drag-and-clear" in Help |
| | Delete cell contents, styling, or both. | Chapter 8, "To delete data" |

## Changing the worksheet's appearance

| | *Feature* | *For more information, see* |
|---|---|---|
| 5 | Set a different color for each worksheet tab. | Search on "Default colors" in Help |
| | Insert or delete a range of cells. | Chapter 8, "Inserting and deleting columns, rows, and ranges" |
| | Insert or delete columns and rows quickly without a dialog box. | Chapter 8, "Inserting and deleting columns, rows, and ranges." |
| | Size columns or rows with the mouse or a menu command. | Chapter 12, "Changing column width," "Changing row height" |
| | Size columns automatically to fit their widest entry. Size rows automatically to fit the largest font in the row. | Chapter 12, "Changing column width," "Changing row height" |
| 5 | Hide columns or worksheets quickly without a dialog box. | Chapter 12, "To hide columns or worksheets" |
| | Hide worksheet tabs, scroll bars, charts, and drawn objects. | Search on "Hiding" in Help |

## Styling data

| | *Feature* | *For more information, see* |
|---|---|---|
| 5 | Copy a range's styles quickly to other ranges. | Chapter 12, "Copying and deleting styles" |
| | Save the settings from a cell to style other ranges. | Chapter 12, "Using named styles" |
| | Customize data quickly with templates from the Style Gallery. | Search on "Templates" in Help and then choose "Style Gallery" |
| 5 | Format numbers using more than 40 different currency types. | Chapter 12, "To change the number format of a range or collection" |
| | Use new Automatic, Label, and Parentheses number formats. | Chapter 12, "Changing the appearance of numbers" |
| | Style data with 256 colors, 64 patterns, 8 line styles and widths, and an unlimited number of fonts. | Chapter 12 |
| | Add designer frames to ranges, charts, and drawn objects. | Chapter 12, "Adding borders and frames," Chapter 16, "To change lines, edges, fills, colors, or designer frames" |
| | Align cell contents horizontally and vertically, wrap data in cells, and change the orientation and angle of cell contents. | Chapter 12, "Changing alignments" |
| | Align text in text blocks. | Chapter 16, "To change the appearance of a text block" |

## Charting and mapping

| | *Feature* | *For more information, see* |
|---|---|---|
| | Quickly create, modify, and enhance charts right on your worksheet. | Chapter 15 |
| | Create radar charts; 3D bar, line, area, and pie charts; candlestick high-low-close-open (HLCO) charts; and comparison bar charts. | Chapter 15, "Types of charts" |
| 5 | Create geographical maps. | Search on "Maps" in Help |
| | Change the default type for new charts and apply the default to selected charts. | Chapter 15, "To change the default chart type" |
| | Rename a selected chart. | Chapter 15, "To rename a chart" |

## Drawing

| | *Feature* | *For more information, see* |
|---|---|---|
| | Add shapes, freehand drawings, text blocks, pictures, and macro buttons directly to the worksheet to enhance data and charts. | Chapter 16 |
| | Select, move, copy, and size drawn objects with the mouse. | Chapter 16, "Working with drawn objects" |
| | Shuffle, flip, and rotate objects; fasten objects to underlying cells; group objects; lock objects | Chapter 16, "Arranging drawn objects" |

## Printing

| | *Feature* | *For more information, see* |
|---|---|---|
| | Print or preview the current worksheet, file, or selected range, chart, drawn object, or query table. | Chapter 13, "Quick printing,""Print previewing" |
| 5 | Preview data in black and white or in color. | Chapter 13, "Print previewing" |
| 5 | Preview two, four, or nine pages at once. | Chapter 13, "Print previewing" |
| 5 | Scroll the data in the Preview window. | Chapter 13, "Print previewing" |
| 5 | Click the left mouse button to enlarge data in the Preview window. | |
| 5 | Center a range horizontally and/or vertically on the printed page. | Chapter 13, "To center a selection for printing" |
| | Size data, drawn objects, and query tables for printing. | Chapter 13, "To shrink or enlarge printed data" |
| | Hide the worksheet frame, grid lines, charts, maps, and other drawn objects on the printed page. | Chapter 13, "To hide or show worksheet elements in print" |
| | Display the date, time, page number, file name, or cell contents in the header or footer. | Chapter 13, "Adding headers and footers" |
| | Name and save the page settings. | Chapter 13, "Using named page settings" |
| | Choose the pages and the number of copies to print. | Search on "Printing data" in Help and then choose "File Print" |

## Analyzing data

| | *Feature* | *For more information, see* |
|---|---|---|
| | Create and view different versions of data in a range, and group them to create scenarios. Share files and consolidate data from other users. | Chapter 17 |
| 5 | Display a prompt to confirm replacing data when you display a different version or scenario without first saving the current data. | Search on "User setup" in Help and then choose "Tools User Setup" |
| 5 | Set the text color for current and unread versions and scenarios in the Version Manager Index by editing the [VERSION] section of the 123R5.INI file. | |
| 5 | Maximize the Version Manager window. | |
| | Work backwards from a formula result to find the value for one or more variables in the formula. | Chapter 19, "Using Backsolver" |
| | Find solutions to a problem that meet constraints that you define. | Chapter 20 |
| | Create what-if tables that calculate formulas with three variables. | Chapter 19, "Using what-if tables" |
| | Analyze formulas, find circular references, and identify links to other files. | Search on "Auditing formulas and values" in Help |

## Using databases

| | *Feature* | *For more information, see* |
|---|---|---|
| 5 | Use Lotus Approach to create forms, reports, dynamic crosstabs, or mailing labels for a 1-2-3 database table. | Search on "Lotus Approach" in Help |
| | Work with external database tables as if they're in a 1-2-3 worksheet. | Chapter 22 |
| | Use new and enhanced DataLens® drivers to work with dBASE, Informix®, and IBM Database Manager tables. Take advantage of Windows Open Database Connectivity (ODBC) drivers. | Chapter 22 |
| | Define selection criteria for database queries graphically. | Chapter 21, "Using criteria" |

*Continued*

| | *Feature* | *For more information, see* |
|---|---|---|
| | Query more than one database table at a time; combine data from separate tables by joining them. | Search on "Joining database tables" in Help |
| | Rename query tables or individual fields. | Chapter 21, "To rename a query table;" search on "Field name alias" in Help |
| | Aggregate values in a query table and create computed columns. | Search on "Aggregate columns" in Help |
| | Cross-tabulate data from a 1-2-3 database table. | Search on "Cross-tabulation" in Help |
| | Display the SQL command equivalent to create the current query table. | Search on "SQL" in Help and then choose "Query Show SQL" |

## Sharing information

| | *Feature* | *For more information, see* |
|---|---|---|
| | Share files on a network. | Search on "Networks" in Help and choose "Sharing Files Using a Network" |
| 5 | Send a range to a group of individuals at once or route it from one name to the next. | Chapter 25, "To send a range" |
| | Send 1-2-3 data electronically. | Chapter 25, "Using mail" |
| 5 | Exchange data between 1-2-3 and Notes. | Search on "Notes/FX" in Help |
| | Create data links between 1-2-3 and other Windows applications. | Chapter 25, "Linking 1-2-3 with other applications" |
| 5 | Create data links by dragging with the mouse. | Search on "Drag-and-drop" in Help and then choose "Creating a Link to 1-2-3 in Another Application" |
| | Create formulas in one file to refer to data in another 1-2-3 file. | Chapter 10, "Referring to other files in formulas" |
| 5 | Update file links automatically when you open files that contain them. | Search on "User setup" in Help and then choose "Tools User Setup" |
| | Embed data from one Windows application into a file in another Windows application. | Chapter 25, "Embedding objects" |

## @Functions

Click the @function selector to see a pull-down menu that gives you quick access to all @functions. Commonly used @functions such as @SUM and @AVG appear on the menu. You can also add the @functions you use most often to it. For more information, see "Entering an @function" on page 118.

## New and enhanced @functions

The tables below list @functions that are new or enhanced in 1-2-3 Release 5 since prior releases of 1-2-3. The tables are grouped by 1-2-3 release number. Depending on the release that you are upgrading from, you might need to look at several tables to see all of the @functions that are new to you. The tables read alphabetically from left to right.

**Help** To display Help about an @function, type the @function name and then press **F1 (HELP)**.

### New @functions for all 1-2-3 users

| | | | |
|---|---|---|---|
| DATESTRING | DURATION | ISEMPTY | MAXLOOKUP |
| MDURATION | MINLOOKUP | NETWORKDAYS | NEXTMONTH |
| SETSTRING | SUMNEGATIVE | SUMPOSITIVE | |

### New @functions since Windows Release 1 and all DOS releases

| | | | |
|---|---|---|---|
| ACCRUED | ACOSH | ACOT | ACOTH |
| ACSC | ACSCH | ASEC | ASECH |
| ASINH | ATANH | AVEDEV | BESSELI |
| BESSELJ | BESSELK | BESSELY | BETA |
| BETAI | BINOMIAL | CHIDIST | CHITEST |
| COMBIN | CORREL | COSH | COT |
| COTH | COV | CRITBINOMIAL | CSC |
| CSCH | DATEDIF | DATEINFO | DAYS |
| DB | DDELINK | DECIMAL | DEGTORAD |
| DEVSQ | DPURECOUNT | ERF | ERFC |
| ERFD | EVEN | EXP2 | FACT |
| FACTLN | FDIST | FTEST | FVAL |
| GAMMA | GAMMAI | GAMMALN | GEOMEAN |
| GRANDTOTAL | HARMEAN | HEX | IPAYMT |
| IRATE | ISFILE | ISMACRO | KURTOSIS |
| LARGE | MATCH | MEDIAN | MIRR |
| NORMAL | NPER | ODD | PAYMT |

*Continued*

| | | | |
|---|---|---|---|
| PERCENTILE | PERMUT | PMTC | POISSON |
| PPAYMT | PRANK | PRICE | PRODUCT |
| PUREAVG | PURECOUNT | PUREMAX | PUREMIN |
| PURESTD | PURESTDS | PUREVAR | PUREVARS |
| PVAL | QUOTIENT | RADTODEG | RANGENAME |
| RANK | REFCONVERT | REGRESSION | ROUNDDOWN |
| ROUNDM | ROUNDUP | SCENARIOINFO | SCENARIOLAST |
| SEC | SECH | SEMEAN | SERIESSUM |
| SIGN | SINH | SKEWNESS | SMALL |
| SQRTPI | SUBTOTAL | SUMSQ | SUMXMY2 |
| TANH | TDIST | TRUNC | TTEST |
| USER | VERSIONCURRENT | VERSIONDATA | VERSIONINFO |
| WEEKDAY | WEIGHTAVG | WORKDAY | XINDEX |
| YIELD | ZTEST | | |

### New @functions since DOS Releases 2 and 3

| | | | |
|---|---|---|---|
| DAYS360 | ISAFF | ISAPP | SOLVER |

### New @functions since DOS Release 2

| | | | |
|---|---|---|---|
| COORD | DGET | DQUERY | DSTDS |
| DVARS | D360 | INFO | ISRANGE |
| SHEETS | STDS | SUMPRODUCT | TODAY |
| VARS | VDB | | |

## Enhanced @functions

The following table describes Release 5 enhancements to @functions.

| | *@Function* | *Enhancement* |
|---|---|---|
| 5 | CELL | Accepts new argument attributes |
| 5 | CELLPOINTER | Accepts new argument attributes |
| | INFO | Accepts new argument attributes |
| 5 | MIRR | You can assume cash flows at the beginning or end of a period |
| 5 | NPV | You can assume cash outflows at the beginning or end of a period |

*Continued*

| | *@Function* | *Enhancement* |
|---|---|---|
| 5 | STRING | You can format the resulting label as fixed, comma, scientific, or general |
| | All database @functions | Can accept a formula or a criteria range as their last argument |

## Macros

This section describes new macro features, new macro commands, enhancements to macros, and new macro key names. The following table describes new macro features.

| | *Feature* | *For more information, see* |
|---|---|---|
| | Run macros by choosing a command, pressing a button, playing back recorded menu choices and keystrokes, or using the keyboard. | Chapter 24, "Running a macro" |
| | Record your actions as macro commands in the Transcript window. | Chapter 24, "Recording a macro" |
| 5 | Create a macro button using commands selected in the Transcript window. | Chapter 24, "To make a macro button from the Transcript window" |
| | Use the Macro Trace window to show the current macro command about to be executed. | Chapter 24, "To use Step mode and Trace" |
| 5 | Use the Macro Commands icon or **F3 (NAME)** to list macro commands alphabetically or by category, and display a brief description of each command. | Chapter 24, "Learning about each macro" |
| 5 | New info components store printer setup information. | Search on "Macro Help" in Help and then choose "Macros" |

### New macro commands

1-2-3 Release 5 macro commands consist of keywords enclosed in {} (braces). For example, the macro command to save the current file is:

{FILE-SAVE [*file-name*];[*file-type*];[*password*];[*backup*]}

1-2-3 offers many new macro commands. You can use macros to query database tables, create versions and scenarios, draw charts, style data, and so on. Other macros let you create windows, menus, and dialog boxes for custom applications.

**Help** To display Help about a macro command or key name, type { followed by the keyword, and then press **F1 (HELP)**.

Unlike 1-2-3 for Windows Release 1, 1-2-3 Release 5 no longer uses {ALT} keystroke macros. To use such macros in Release 5, you need to translate them. For information on using macros created in either 1-2-3 for Windows Release 1 or 1-2-3 for DOS Release 2 or 3, see Appendix A.

The tables below list macro commands that are new or enhanced in 1-2-3 Release 5. The tables are grouped by 1-2-3 release number. Depending on the release that you are upgrading from, you might need to look at several tables to see all of the macros that are new to you. The tables read alphabetically from left to right.

### New macro commands for all 1-2-3 users

| | | |
|---|---|---|
| {MAP-NEW} | {MAP-REDRAW} | {MODELESS-DISMISS} |
| {MODELESS-DISPLAY} | {REGISTER} | {SCENARIO-INFO} |
| {SCENARIO-REMOVE-VERSION} | {SEND-RANGE} | {SEND-RANGE-LOGIN} |
| {UNREGISTER} | {VERSION-INDEX-COPY} | {VERSION-REPORT} |

### New macro commands since Windows Release 1 and all DOS releases

| | | |
|---|---|---|
| {--} | {ADDIN-INVOKE} | {ADDIN-LOAD} |
| {ADDIN-REMOVE} | {ADDIN-REMOVE-ALL} | {ALERT} |
| {AUDIT} | {BACKSOLVE} | {CELL-ENTER} |
| {CHART-ASSIGN-RANGE} | {CHART-AXIS-INTERVALS} | {CHART-AXIS-LIMITS} |
| {CHART-AXIS-SCALE-TYPE} | {CHART-AXIS-TICKS} | {CHART-AXIS-TITLE} |
| {CHART-AXIS-UNITS} | {CHART-COLOR-RANGE} | {CHART-DATA-LABELS} |
| {CHART-FOOTNOTE} | {CHART-GRID} | {CHART-LEGEND} |
| {CHART-NEW} | {CHART-PATTERN-RANGE} | {CHART-PIE-LABELS} |
| {CHART-PIE-SLICE-EXPLOSION} | {CHART-RANGE} | {CHART-RANGE-DELETE} |
| {CHART-RENAME} | {CHART-SET-PREFERRED} | {CHART-TITLE} |
| {CHART-TYPE} | {CHART-USE-PREFERRED} | {CHOOSE-FILE} |
| {CHOOSE-ITEM} | {CHOOSE-MANY} | {CHOOSE-ONE} |
| {COLUMN-WIDTH} | {COLUMN-WIDTH-FIT-WIDEST} | {COLUMN-WIDTH-RESET} |
| {CROSSTAB} | {DATABASE-APPEND} | {DATABASE-CONNECT} |
| {DATABASE-CREATE-TABLE} | {DATABASE-DELETE} | {DATABASE-DISCONNECT} |
| {DATABASE-FIND} | {DATABASE-SEND-COMMAND} | {DATA-TABLE-1} |
| {DATA-TABLE-2} | {DATA-TABLE-3} | {DATA-TABLE-RESET} |
| {DDE-TABLE} | {DELETE-COLUMNS} | {DELETE-ROWS} |
| {DELETE-SHEETS} | {DIALOG} | {DIALOG?} |

*Continued*

{DISTRIBUTION}
{EDIT-COPY-FILL}
{EDIT-FIND}
{EDIT-FIND?}
{EDIT-GOTO}
{EDIT-OBJECT}
{EDIT-PASTE-SPECIAL}
{EDIT-QUICK-COPY}
{EDIT-QUICK-MOVE}
{EDIT-REPLACE}
{EDIT-REPLACE-ALL}
{FILE-CLOSE}
{FILE-COMBINE}
{FILE-EXIT}
{FILE-EXTRACT}
{FILE-GET-RESERVATION}
{FILE-IMPORT}
{FILE-NEW}
{FILE-OPEN}
{FILE-OPEN?}
{FILE-RELEASE-RESERVATION}
{FILE-RETRIEVE}
{FILE-SAVE}
{FILE-SAVE-ALL}
{FILE-SAVE-AS?}
{FILE-SEAL}
{FILE-SEAL-NETWORK-RESERVATION}
{FILE-UNSEAL}
{FILE-UPDATE-LINKS}
{FILL}
{FILL-BY-EXAMPLE}
{GET-FORMULA}
{GET-LABEL}
{GET-NUMBER}
{GET-RANGE}
{GRAPH-NEW}
{GRAPH-VIEW}
{HIDE-COLUMNS}
{HIDE-SHEETS}
{INSERT-COLUMNS}
{INSERT-OBJECT}
{INSERT-ROWS}
{INSERT-SHEETS}
{LOTUS-LAUNCH}
{MATRIX-INVERT}
{MATRIX-MULTIPLY}
{MENU-COMMAND-ADD}
{MENU-COMMAND-DISABLE}
{MENU-COMMAND-ENABLE}
{MENU-COMMAND-REMOVE}
{MENU-CREATE}
{MENU-INSERT}
{MENU-RESET}
{NAMED-STYLE-USE}
{PAGE-BREAK-COLUMN}
{PAGE-BREAK-ROW}
{PARSE}
{PARSE-CREATE}
{PARSE-RESET}
{PLAY}
{PRINT}
{PRINT?}
{PRINT-NAME-ADD}
{PRINT-NAME-USE}
{PRINT-RESET}
{PROTECT}
{QUERY-ADD-FIELD}
{QUERY-AGGREGATE}
{QUERY-CHOOSE-FIELDS}
{QUERY-COPY-SQL}
{QUERY-CRITERIA}
{QUERY-DATABASE-TABLE}
{QUERY-JOIN}
{QUERY-NAME}
{QUERY-NEW}
{QUERY-OPTIONS}
{QUERY-REFRESH}
{QUERY-REMOVE-FIELD}
{QUERY-SHOW-FIELD}
{QUERY-SORT}
{QUERY-SORT-KEY-DEFINE}
{QUERY-SORT-RESET}
{QUERY-UPDATE}
{QUERY-UPGRADE}
{RANGE-NAME-CREATE}
{RANGE-NAME-DELETE}
{RANGE-NAME-DELETE-ALL}
{RANGE-NAME-LABEL-CREATE}
{RANGE-NAME-TABLE}
{RANGE-TRANSPOSE}
{RANGE-VALUE}
{RANGE-VERSION?}
{REGRESSION}
{ROW-HEIGHT}
{ROW-HEIGHT-FIT-LARGEST}
{SCENARIO-ADD-VERSION}
{SCENARIO-CREATE}
{SCENARIO-DELETE}
{SCENARIO-SHOW}
{SCROLL-COLUMNS}
{SCROLL-ROWS}
{SCROLL-TO-CELL}
{SCROLL-TO-COLUMN}
{SCROLL-TO-OBJECT}
{SCROLL-TO-ROW}
{SELECT}
{SELECT-ALL}
{SELECT-APPEND}
{SELECT-REMOVE}
{SELECT-REPLACE}
{SEND-MAIL}
{SEND-SQL}
{SET}
{SHEET-NAME}
{SHEET-NAME-DELETE}
{SHOW-COLUMNS}
{SHOW-SHEETS}

*Continued*

{SMARTICONS-USE}
{SMARTSUM}
{SOLVER-ANSWER}
{SOLVER-ANSWER-SAVE}
{SOLVER-DEFINE}
{SOLVER-DEFINE?}
{SOLVER-REPORT}
{SORT}
{SORT-ASCENDING}
{SORT-DESCENDING}
{SORT-KEY-DEFINE}
{SORT-RESET}
{SPELLCHECK}
{STYLE-ALIGN-HORIZONTAL}
{STYLE-ALIGN-ORIENTATION}
{STYLE-ALIGN-VERTICAL}
{STYLE-BORDER}
{STYLE-EDGE}
{STYLE-FONT}
{STYLE-FONT-ATTRIBUTES}
{STYLE-FONT-RESET}
{STYLE-FONT-SIZE}
{STYLE-FRAME}
{STYLE-GALLERY}
{STYLE-INTERIOR}
{STYLE-LINE}
{STYLE-NUMBER-FORMAT}
{STYLE-NUMBER-FORMAT-RESET}
{TOGGLE-OUTLINE}
{TOGGLE-SHADOW}
{UNPROTECT}
{UPDATE-OBJECT}
{VERSION-CREATE}
{VERSION-DELETE}
{VERSION-INDEX-MERGE}
{VERSION-INFO}
{VERSION-SHOW}
{VERSION-UPDATE}
{VIEW-ZOOM}
{WINDOW}
{WINDOW-ACTIVATE}
{WINDOW-ARRANGE}
{WORKSHEET-TITLES}
{ZOOM}

## New macro commands since DOS Releases 2 and 3

{APP-ADJUST}
{APP-STATE}
{COMMIT}
{DDE-ADVISE}
{DDE-CLOSE}
{DDE-EXECUTE}
{DDE-OPEN}
{DDE-POKE}
{DDE-REQUEST}
{DDE-UNADVISE}
{DDE-USE}
{EDIT-CLEAR}
{EDIT-COPY}
{EDIT-CUT}
{EDIT-PASTE}
{EDIT-PASTE-LINK}
{FORMBREAK}
{LAUNCH}
{LINK-ASSIGN}
{LINK-CREATE}
{LINK-DEACTIVATE}
{LINK-DELETE}
{LINK-REMOVE}
{LINK-TABLE}
{LINK-UPDATE}
{ROLLBACK}
{WINDOW-ADJUST}
{WINDOW-SELECT}
{WINDOW-STATE}

## New macro commands since DOS Release 2

{APPENDBELOW}
{APPENDRIGHT}
{BREAK}
{FORM}

## Enhanced macros

The following table describes Release 5 enhancements to macros.

| | *Macro command* | *Enhancement* |
|---|---|---|
| 5 | {ALERT} | Accepts optional arguments to position the message box |
| 5 | {CHOOSE-FILE} | Accepts optional arguments to position the dialog box |
| 5 | {CHOOSE-ITEM} | Accepts optional arguments to position the dialog box |
| 5 | {CHOOSE-MANY} | Accepts optional arguments to position the dialog box |
| 5 | {CHOOSE-ONE} | Accepts optional arguments to position the dialog box |
| | {DDE-ADVISE} | Accepts optional arguments to send data to a range when the data changes; also lets you choose whether to acknowledge data messages |
| | {DDE-CLOSE} | Accepts an optional argument that identifies which conversation to terminate |
| 5 | {DIALOG} | Supports default settings for combo and list box controls |
| 5 | {DIALOG?} | Accepts dialog box name arguments |
| | {EDIT-CLEAR} | Accepts "contents," "styles," or "both" as an optional *property* argument |
| | {EDIT-COPY} | Copies a selected object in addition to a range |
| | {EDIT-CUT} | Cuts a selected object in addition to a range |
| | {EDIT-PASTE} | Pastes an object in addition to a range or data from another application |
| | {EDIT-PASTE-LINK} | Creates an OLE or file link, in addition to a DDE link |
| 5 | {FILE-COMBINE} | Accepts .DB and .DBF file types |
| 5 | {FILE-EXTRACT} | Accepts .DB and .DBF file types |
| 5 | {FILE-IMPORT} | Accepts an optional character set argument, and new values for controlling how 1-2-3 imports the data |
| 5 | {FILE-NEW} | Accepts an optional argument to use a SmartMaster |
| 5 | {FILE-OPEN} | Accepts an optional character set argument, and new values for controlling how 1-2-3 opens a text file |
| 5 | {FILE-SAVE} | Accepts .DB, .DBF, .WT4, .XLS, and .XLW file types |
| 5 | {GET-FORMULA} | Accepts optional arguments to position the dialog box |
| 5 | {GET-LABEL} | Accepts optional arguments to position the dialog box |
| 5 | {GET-NUMBER} | Accepts optional arguments to position the dialog box |

*Continued*

| | *Macro command* | *Enhancement* |
|---|---|---|
| 5 | {GET-RANGE} | Accepts optional arguments to position the dialog box |
| | {LAUNCH} | Accepts an optional argument to switch to another active Windows application |
| | {LINK-ASSIGN} | Supports OLE in addition to DDE |
| | {LINK-CREATE} | Supports OLE in addition to DDE |
| | {LINK-DEACTIVATE} | Supports OLE in addition to DDE |
| | {LINK-DELETE} | Supports OLE in addition to DDE |
| | {LINK-REMOVE} | Supports OLE in addition to DDE |
| | {LINK-TABLE} | Supports OLE in addition to DDE |
| | {LINK-UPDATE} | Supports OLE in addition to DDE |
| 5 | {MENUBRANCH} | Accepts optional arguments to position the dialog box |
| 5 | {MENUCALL} | Accepts optional arguments to position the dialog box |
| 5 | {STYLE-NUMBER-FORMAT} | Accepts an optional argument for currency type |

## New macro key names

The tables below lists new macro key names in 1-2-3 Release 5 that correspond to keys, key combinations, and function keys.

1-2-3 doesn't have macro key names for the following keys: **ALT+F1 (COMPOSE)**, **CAPS LOCK**, **NUM LOCK**, **PRINT SCREEN**, **SCROLL LOCK**, and **SHIFT**. Therefore, you can't use these keystrokes in a macro.

### New macro key names for Windows Release 1 and DOS Release 2 and 3 users

| | | |
|---|---|---|
| {SELECT-BIGLEFT} | {SELECT-BIGRIGHT} | {SELECT-DOWN} |
| {SELECT-FIRSTCELL} | {SELECT-HOME} | {SELECT-LASTCELL} |
| {SELECT-LEFT} | {SELECT-NEXTSHEET} | {SELECT-PGDN} |
| {SELECT-PGUP} | {SELECT-PREVSHEET} | {SELECT-RIGHT} |
| {SELECT-UP} | | |

### New macro key names for DOS Release 2 and 3 users

| | | |
|---|---|---|
| {ANCHOR} | {BACKTAB} | {TAB} |

### New macro key names for DOS Release 2 users

| | | |
|---|---|---|
| /, <, {MENU} | {ADDIN}, {APP4} | {D} |
| {FC}, {FIRSTCELL} | {FF}, {FIRSTFILE}, {FILE}{HOME} | {FILE} |
| {HELP} | {INS}, {INSERT} | {LC}, {LASTCELL} |
| {LF}, {LASTFILE}, {FILE}{END} | {NF}, {NEXTFILE}, {FILE}{NS} | {NS}, {NEXTSHEET} |
| {PF}, {PREVFILE}, {FILE}{PS} | {PS}, {PREVSHEET} | {R} |
| {U} | {WINDOW} | {ZOOM} |

## Customizing 1-2-3

New settings let you customize the way 1-2-3 looks and behaves.

### Worksheet defaults

5

To control default settings such as font, number format, column width, and alignment for the current worksheet, use Style Worksheet Defaults. You can also change the default font and worksheet tab color. Style Worksheet Defaults also lets you turn Group mode on or off. When you group worksheets, all the worksheets in the file take on the settings of the current worksheet.

**Help** For more information, highlight Style Worksheet Defaults and press **F1 (HELP)**.

#### Setting colors

Style Worksheet Defaults lets you control the default colors for text and the cell background in the current worksheet. You can set different colors for each worksheet and display negative values in either red or the default text color.

Initially, 1-2-3 displays data using the default colors set in the Windows Control Panel but uses black text on a white background for previewing and printing. If you use Style Worksheet Defaults to change the text or cell background colors, 1-2-3 uses the new settings for display, previewing, and printing. If you decide later to display data using the default Windows colors, 1-2-3 updates the display but keeps the previously selected text and cell background colors for previewing and printing.

## Display defaults

To set display defaults for files and the 1-2-3 window, use View Set View Preferences. You can:

- Set the worksheet frame type, grid line color, and display size of cells
- Hide or show parts of the current file including the worksheet frame, tabs, grid lines, scroll bars, page breaks, charts, maps, and drawn objects
- Hide or show the SmartIcons, edit line, and status bar
- 5 Save the settings for the current file as defaults for all new files

**Help** For more information, highlight View Set View Preferences and press **F1 (HELP)**.

## User settings

To change international, recalculation, and other settings, use Tools User Setup. New settings let you:

- 5 Turn the New File and Welcome to 1-2-3 dialog boxes on or off
- Turn drag-and-drop on or off
- 5 Display a prompt to confirm replacing data when you either drag and drop on top of existing data, or when you display a different version or scenario without first saving the current data
- Set the default number format to Automatic or General
- Save active 1-2-3 files automatically
- Turn Undo on or off
- Set autoexecute macros to run when you open files
- Turn error beeps on or off
- 5 Update file links automatically when you open worksheet files
- Change the number of recently used files on the File menu
- Set the user name associated with the file and versions and scenarios
- 5 Leave the default directory setting blank in 1-2-3
- 5 Set the default currency type and choose whether to display a currency symbol or the ISO code

**Help** For more information, highlight Tools User Setup and press **F1 (HELP)**.

### Default number format

In Release 5, the default number format is Automatic. **Automatic** format displays new number entries in the format in which you enter them. For example, if you enter 100%, 1-2-3 applies the Percent format. However, if you type a plain number, text, numbers and text, or a formula, 1-2-3 leaves the cell unformatted. Also, when you edit a date, time, or percent, it appears formatted in the contents box.

### Customizing 1-2-3 through the Program Manager

5 You can also turn off the initial screen and the Welcome to 1-2-3 dialog box that appear each time you start 1-2-3 by editing the 1-2-3 command line in the Program Manager. To turn off the initial screen, use -L. To turn off the Welcome to 1-2-3 dialog box, use -Q. For example, to turn off the initial screen and the dialog box, use this command line: C:\123R5W\123W.EXE -L -Q.

5 You can specify your default worksheet directory in Program Manager. To do this, leave the Worksheet directory blank in Tools User Setup. In Program Manager, select the 1-2-3 Release 5 icon and choose File Properties. Enter the directory name in the Working Directory text box.

## Add-ins

Because you're running 1-2-3 Release 5 in Windows, you can't use add-ins designed for 1-2-3 releases that run in other environments such as DOS or OS/2. If you want to use such an add-in, contact the developer or manufacturer of the add-in to see if a version is available for 1-2-3 Release 5.

# 3 Starting and Ending 1-2-3

1-2-3 combines powerful spreadsheet and presentation features in an easy-to-use graphical environment. This chapter introduces 1-2-3 and describes how to start 1-2-3, what you see when you start, and how to end a 1-2-3 session.

**Help** Use online Help for quick answers to your questions about 1-2-3. Help provides information about all menu commands, dialog boxes, procedures, and messages. See the back cover of this book to find out how to get Help. Choose Help Using Help from the 1-2-3 menu to learn more about Help's features.

## What is 1-2-3?

1-2-3 Release 5 is an electronic spreadsheet for managing and presenting data in the Microsoft Windows environment. 1-2-3 offers advanced spreadsheet, charting, drawing, scenario, and database features. It uses the Windows graphical interface, while maintaining compatibility with other releases of 1-2-3.

1-2-3 provides an easy-to-use interface including customizable SmartIcons, an @Function menu, a worksheet navigator, tabs for named worksheets, and an interactive status bar. It also includes drag-and-drop moving and copying of data, improved database querying, a spelling checker, scenario and auditing tools, and more than 300 @functions and macro commands.

## Starting 1-2-3

Before starting 1-2-3, you must install it as described in Chapter 1.

### To start 1-2-3

1. Start Windows.
2. Open the Windows Program Manager.

3. Open the Lotus Applications window (or the group window that contains 1-2-3).

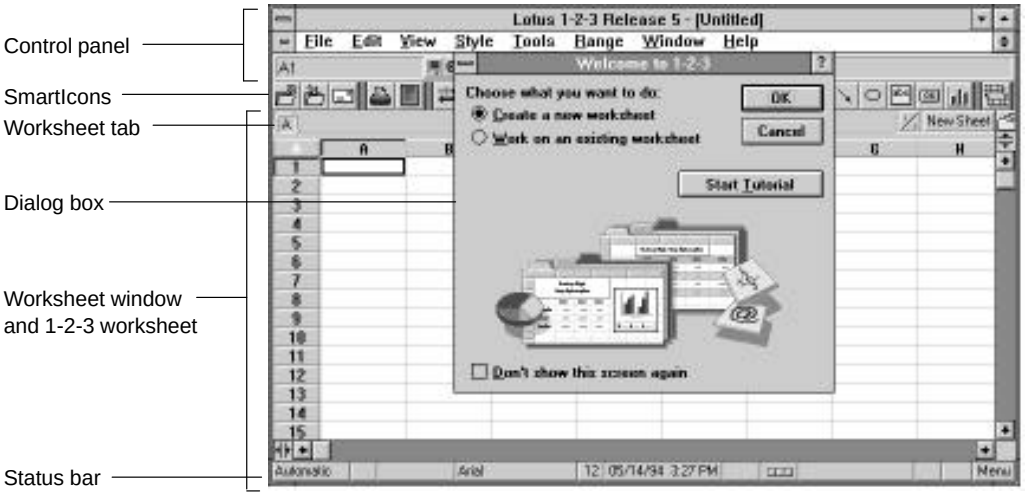
4. Select the 1-2-3 for Windows application icon (or the name assigned):

   **Mouse** Double-click the icon.

   **Keyboard** Move the highlight to the icon with ↑, ↓, →, ←, and press **ENTER**.

1-2-3 displays the program title screen briefly and then the 1-2-3 window with a full-size Worksheet window inside it. The Welcome to 1-2-3 dialog box lets you choose whether to create a new worksheet, work on an existing file, or start the online Tutorial.

If you don't want 1-2-3 to display the Welcome to 1-2-3 dialog box each time you begin a session, select "Don't show this screen again." If you change your mind, choose Tools User Setup and deselect "Skip Welcome dialog box."



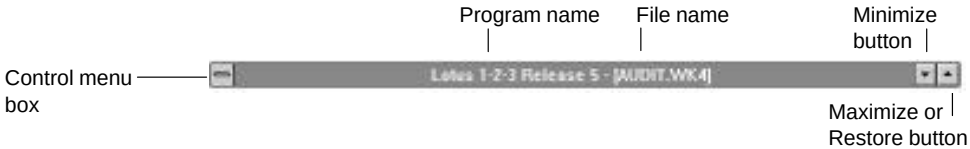

**Help** For more information about each part of the Worksheet window, search on "Parts of the 1-2-3 window" in Help. In the picture of the Worksheet window, you can pop up a description of any part of the window by pointing to the part and clicking it.

## The control panel

The **control panel** displays information about 1-2-3 and about the active window. It contains the title bar, the main menu**,** and the edit line.

## The title bar

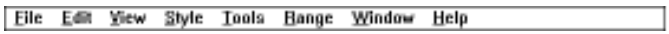
The **title bar** of the 1-2-3 window contains the Control menu box, the program name, the file name, the Minimize button, and the Maximize or Restore button.



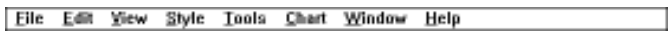

When you highlight a command in the menu, the title bar displays a description of the command. To get Help about a command, press **F1 (HELP)** while the command is highlighted. Sometimes when you choose a command, the title bar displays instructions to help you complete the command. For example, look in the title bar when you're drawing an arrow or creating a chart.

## The main menu

The **main menu** contains the commands that you use with 1-2-3. One command on the main menu changes, depending on the current selection. For example, when you select a range, the main menu displays the Range command.

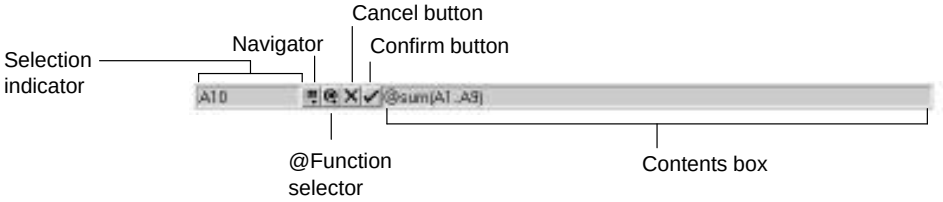



When you select a chart, the Chart command replaces the Range command. See Chapter 5 for more information about using 1-2-3 commands.



## The edit line

The edit line contains the selection indicator, the navigator, the @function selector, the Cancel and Confirm buttons, and the contents box.



The **selection indicator** displays the address or name of the current selection, such as a range, chart, query table, or embedded object. Click the **navigator** to display a list of named ranges in the current file. In Ready mode, you can go to and select a named range by selecting its name from the list. In Value or Edit mode, you can select a named range from the navigator list to put in a formula or dialog box.

Click the **@function selector** to display the @Function menu. You can select an @function and enter it in formulas. You can customize the @Function menu by adding and removing @functions. For more information on using the @Function menu, see page 118. For information about customizing the @Function menu, see page 120.

When you enter data, such as @functions, formulas, numbers, and labels, 1-2-3 displays the data in the **contents box**, and the Cancel and Confirm buttons appear. Click **Confirm** to enter the data or **Cancel** to cancel the entry.

## SmartIcons

SmartIcons are shortcuts for many 1-2-3 tasks. For example, you can make an entry bold by clicking an icon instead of choosing the Style Font & Attributes command and selecting the bold option in the dialog box.

*To find out what an icon does, hold the mouse pointer over the icon. A description appears next to the icon. You can turn this option off with Tools SmartIcons.*

1-2-3 displays a set of SmartIcons that you can move, hide, and customize to contain only the icons you want. You can also assign a macro to an icon and customize the appearance of an icon. For detailed information about customizing SmartIcons, see Chapter 23.

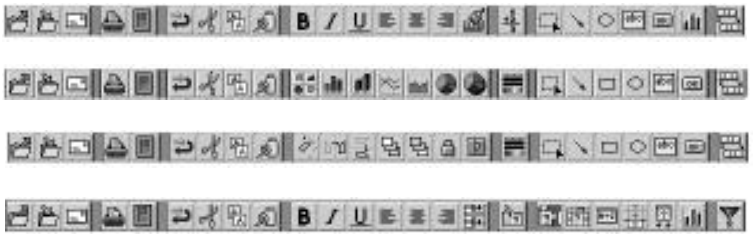
1-2-3 displays a different set of SmartIcons depending on the current selection. The next illustration shows the default sets of SmartIcons.

Set of SmartIcons when a range is selected

Set of SmartIcons when a chart is selected

Set of SmartIcons when a drawn object is selected

Set of SmartIcons when a query table is selected



**Help** For a SmartIcons reference organized by function, with a picture and description of each icon, search on “SmartIcons” in Help.

## To use SmartIcons

1. If the icon acts on a range, select the range.

   For example, to sum a column of numbers, select the blank cell below the numbers.

2. Click the icon.

   For example, click the SmartSum icon to add the column of numbers and enter the sum in the blank cell.

   **Note** You can’t select SmartIcons with the keyboard.

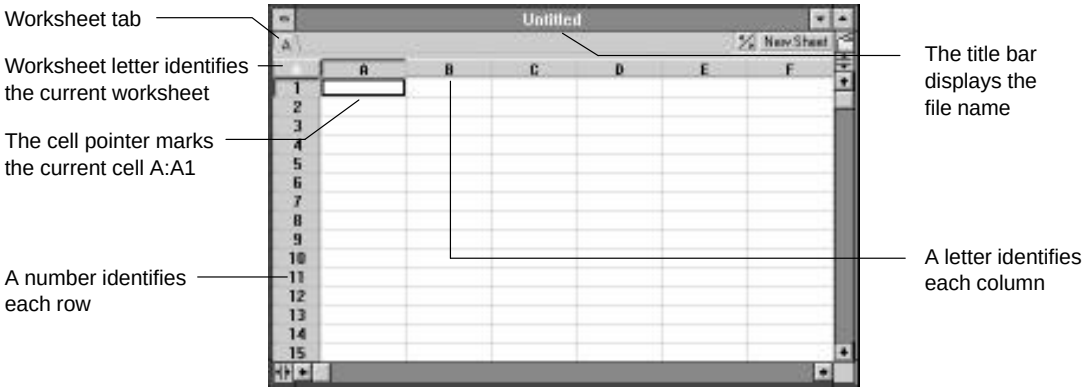
If the icon acts on a range, 1-2-3 performs the command without displaying a dialog box. Other SmartIcons display a dialog box or perform some other action.

## The Worksheet window

The 1-2-3 **Worksheet window** always contains at least one **1-2-3 worksheet**, an electronic spreadsheet consisting of a grid of 256 columns and 8,192 rows. Each time you create a new file or open an existing file, 1-2-3 opens an additional Worksheet window with its own worksheet.

If you are using a SmartMaster template, your Worksheet window might contain several worksheets the first time you open it. This section describes a Worksheet window that contains one worksheet. For more information about SmartMaster templates, see page 55.

Column letters for each column appear above the worksheet. Columns are lettered A to IV (A to Z, AA to AZ, BA to BZ, and so on to IV). Row numbers for each row appear to the left of the worksheet. Rows are numbered 1 to 8192. The next illustration shows the basic parts of a worksheet. The title bar appears when you reduce the worksheet, as shown in the next illustration.




Initially, a 1-2-3 file has one worksheet. You can insert additional worksheets and create a **multiple-sheet file** with up to 256 worksheets. Each worksheet is identified by a letter from A to IV. The worksheet letter appears in the top left corner of the worksheet.

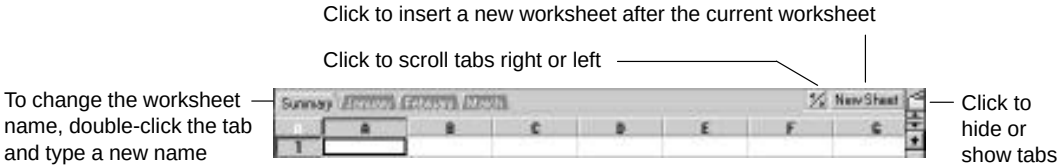
The intersection of a column and a row is called a **cell**. Each cell has an **address** consisting of a worksheet letter followed by a : (colon), a column letter, and a row number. For example, cell A:A1 is in worksheet A at the intersection of column A and row 1.

The rectangular highlight in the worksheet is the **cell pointer**. The cell pointer identifies the **current cell**. When a cell is current, you can enter data into the cell, edit the contents of the cell, and choose commands that affect the cell. You change the current cell by moving the cell pointer.

The worksheet containing the current cell is the **current worksheet**. You can display any worksheet in a multiple-sheet file, and you can also display more than one worksheet at a time in the Worksheet window.

## Worksheet tabs

**Worksheet tabs** show you if a file contains more than one worksheet. 1-2-3 automatically names each tab A, B, C, and so on. You can use the tab to change the name for the worksheet. You can use worksheet names when referring to ranges in formulas.




You can name worksheets by typing directly on the tab. If you have an existing worksheet name that 1-2-3 recognizes as part of a common sequence, such as one month in the months of the year, 1-2-3 can name new worksheets automatically when you click the New Sheet button.

**Help** For more information about naming worksheets automatically, search on "Naming worksheets" in Help.

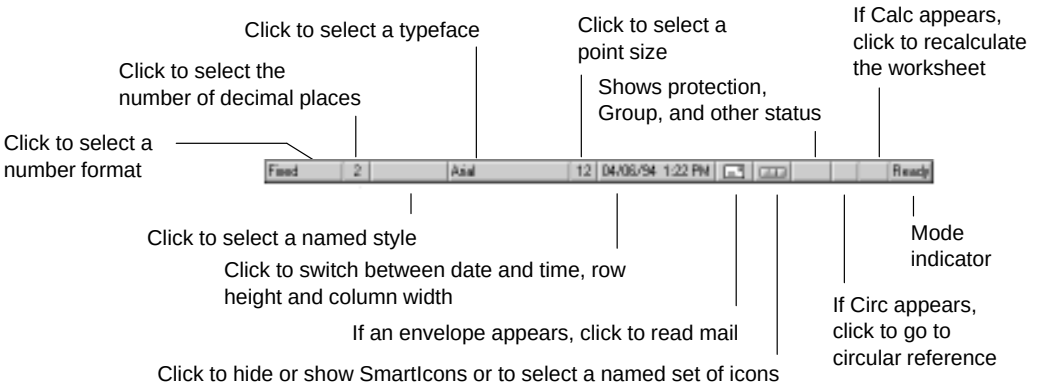
You can choose Style Worksheet Defaults to change the color of a worksheet tab.

You can click a worksheet's tab to move to that worksheet. You can also use tabs to select a range across two or more adjacent worksheets, a 3D range. To select a 3D range, select a range on the first worksheet, and then **SHIFT**+click the tab of the last worksheet in your 3D range.

When you have more tabs than you can see in the Worksheet window, you can click the tab-scroll arrows to scroll the tabs left or right without changing the current selection. **SHIFT**+click the tab-scroll arrows to scroll the tabs to the first or last worksheet in the file.

## The status bar

The status bar gives you information about the current selection and tells you what 1-2-3 is doing. You can also use the status bar to perform many tasks with the mouse.




## Ending 1-2-3

When you end a 1-2-3 session, 1-2-3 closes all active files and redisplays the Windows Program Manager window. When 1-2-3 closes a file, it removes the file from memory but not from disk.

### To end a 1-2-3 session

1. Choose File Exit or press **ALT+F4**.

   If you saved all changes to the active files, the 1-2-3 window closes. If you changed an active file without saving the changes, you see this dialog box for each modified file:

2. If a dialog box appears, choose an option:
   - Yes saves the changes to the file listed in the dialog box, and then ends the session or displays another dialog box if there are more modified files.

     If a file is untitled, the Save As dialog box appears and lets you enter a file name.
   - No ends the session without saving changes.
   - Cancel returns you to 1-2-3 without saving changes.
   - Save All saves changes to all modified files and ends the session.

     If a file is untitled, the Save As dialog box appears and lets you enter a file name.

# 4 Managing the 1-2-3 Windows

This chapter describes the different types of windows in 1-2-3. It also describes how to use the mouse and how to work with windows.

## What are the 1-2-3 windows?

You use the following windows when you work in 1-2-3:

| *Window* | *Description* |
|---|---|
| 1-2-3 window | Contains 1-2-3. All 1-2-3 windows, except the Help window, open within the 1-2-3 window. |
| Worksheet window | Opens when you start 1-2-3 or open a file. It contains a worksheet file, the 1-2-3 electronic spreadsheet. You enter and work with numbers, formulas, text, and graphics in a worksheet file. |
| Help window | Displays Help about 1-2-3. For more information about Help, see the back cover of this book, or choose Help Using Help. |
| 1-2-3 Classic window | Displays the 1-2-3 Release 3.1 menu or the Wysiwyg menu. You can use 1-2-3 Classic as an alternative to using the 1-2-3 main menu. For more information, see “Using 1-2-3 Classic” on page 53. |
| Transcript window | Displays recorded keystrokes, menu choices, and mouse actions as a series of macro commands. You can paste recorded macro commands from the Transcript window into a worksheet or macro button. For more information, see “Recording a macro” on page 268. |
| Print Preview window | Shows you how your printed output will appear. For more information, see “Print previewing”on page 141. |

*Continued*

| *Window* | *Description* |
|---|---|
| Macro Trace window | Helps you debug macros by showing the current macro command as it runs. For more information, see "Debugging a macro" on page 276. |
| Version Manager window | Helps you create, maintain, and track versions and scenarios. For more information, see Chapter 17. |

## Using the mouse

You can use the mouse, like the keyboard, to choose commands, highlight ranges, and manipulate charts and other drawn objects. There are some actions that you can do only with the mouse, such as using SmartIcons.

When a procedure says to press a mouse button, use the left mouse button unless you specified left-handed use of the mouse in the Windows Control Panel. For more information, see your Windows documentation.

Press the right mouse button to display a menu of useful commands for working with the current selection. For more information about using the right mouse button, see "Using 1-2-3 quick menus" on page 49.

The table below lists the terms for mouse actions.

| *Term* | *Action* |
|---|---|
| Click | Quickly press and release the mouse button |
| Double-click | Quickly press and release the mouse button twice |
| Drag | Press and hold down the mouse button while moving the mouse |
| Point | Position the mouse pointer |

### The mouse pointer

The **mouse pointer** tells you what part of the screen your next mouse action will affect. For example, when you move the mouse pointer to a window border, your next mouse action will affect that border. To move the mouse pointer, you move the mouse.

The shape of the mouse pointer changes depending on the current pointer location and the task you can perform at that location. For example, when you move the mouse pointer to a window border, the

pointer changes to a white two-headed arrow. This pointer shape indicates that you can use the mouse to size the window.

The table below shows mouse pointer shapes and describes the tasks you can perform when each pointer shape appears.

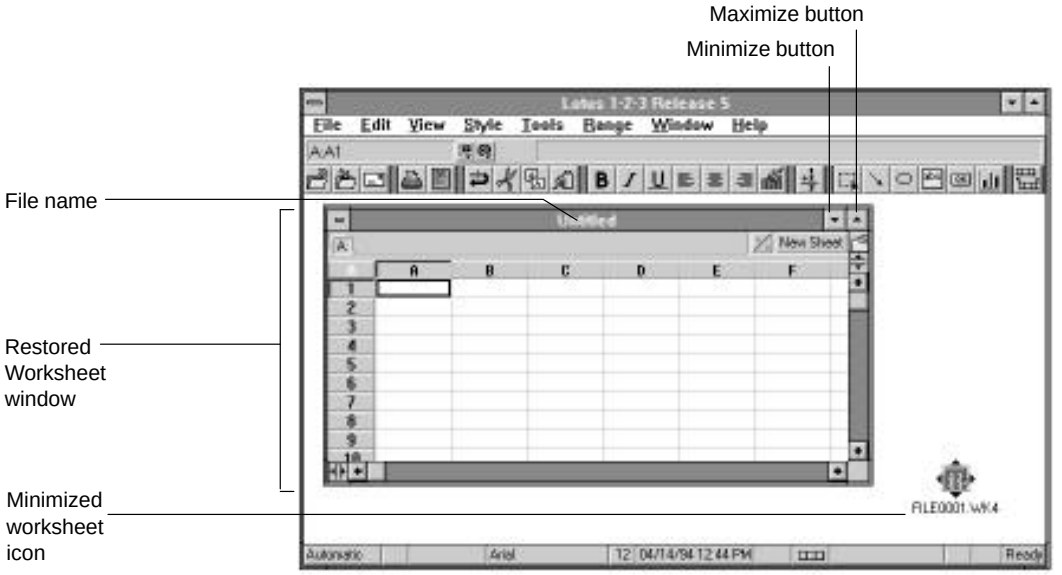
| *Mouse pointer shape* | *What you can do* |
|---|---|
| | Move the cell pointer and select cells and ranges; make a window active; move a window; scroll a window; open a Control menu; choose commands; move around in a dialog box; select dialog box options |
| | Wait until 1-2-3 finishes performing a task |
| | Size a window with the keyboard |
| | Size a window with the mouse |
| | Enter and edit data |
| | Size a row; create or size a horizontal pane |
| | Size a column; create or size a vertical pane |
| | Select a range |
| | Begin to move or copy the current selection by dragging |
| | Drag the current selection to a new location |
| | Drag a copy of the current selection to a new location |
| | Position a new chart |
| | Position a drawn object |
| | Select one or more drawn objects |
| | Create a freehand drawing |

*Continued*

| *Mouse pointer shape* | *What you can do* |
|---|---|
| | Display a definition in Help or go to a Help cross-reference; click a macro button |
| | Copy styles from a selected range to another range |
| | Drag and fill a sequence of data. |

## Working with 1-2-3 windows

Within the 1-2-3 window, you can size and move windows, arrange windows in a cascade or tile pattern, and close a window. Using the mouse is the simplest and most efficient way to size, move, and close 1-2-3 windows. You can also use the Window commands and the commands in each window's Control menu.



## Manipulating 1-2-3 windows

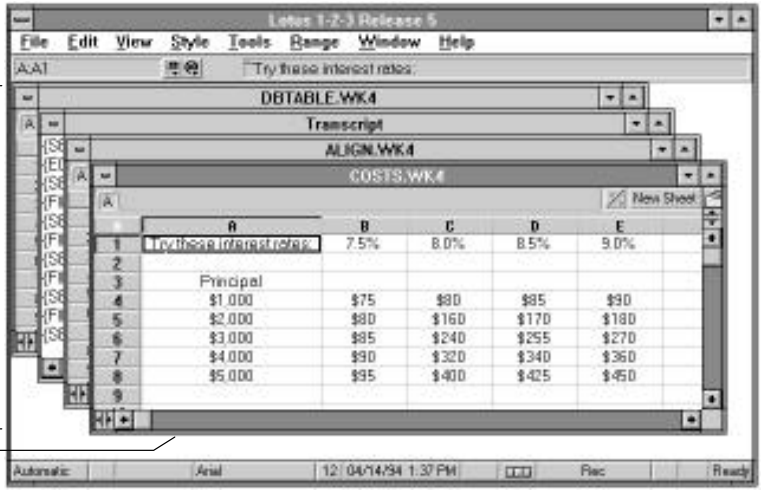
The following table summarizes window operations in 1-2-3.

| *Operation* | *With the mouse* | *With the keyboard* |
|---|---|---|
| Make a window active | Click anywhere in the window. | Press **ALT+W**; press ↓ to highlight the window name; press **ENTER**. |
| Display a Control menu | Click the Control menu box in the top left corner. | Press **ALT+ SPACEBAR** to display the Control menu for the 1-2-3 window or a dialog box; press **ALT+ -** (hyphen) to display the Control menu for a window that's open in the 1-2-3 window. |
| Maximize a window | Click the Maximize button. | Make the window active; press **ALT+ -** (hyphen) to display the Control menu; choose Maximize. |
| Restore a maximized window | Click the Restore button. | Press **ALT+ -** (hyphen) to display the Control menu; choose Restore. |
| Minimize a window to an icon | Click the Minimize button. | Make the window active; press **ALT+ -** (hyphen) to display the Control menu; choose Minimize. |
| Restore a minimized window | Double-click the minimized window. | Make the window active; press **ALT+ -** (hyphen) to display the Control menu; choose Restore. |
| Size a window | Point to a border or corner of the window; drag the window border or corner; when the window is the size you want, release the mouse button. | Make the window active; press **ALT+ -** (hyphen) to display the Control menu; choose Size. Use ↓, ↑, ↓, ← to size the window; when the window is the size you want, press **ENTER**. |
| Move a window | Point to the title bar; drag the window to the position you want, and release the mouse button. | Make the window active; press **ALT+ -** (hyphen) to display the Control menu; choose Move; use ↑, ↓, →, ← to move the window; press **ENTER** when the window is where you want it. |
| Close a window | Double-click the Control menu box in the top left corner of the window. | Make the window active; press **CTRL+F4**. |

## To cascade windows

When you **cascade** windows, 1-2-3 arranges them on top of one another with the active window on top of the cascade and only the title bars of each underlying window visible.

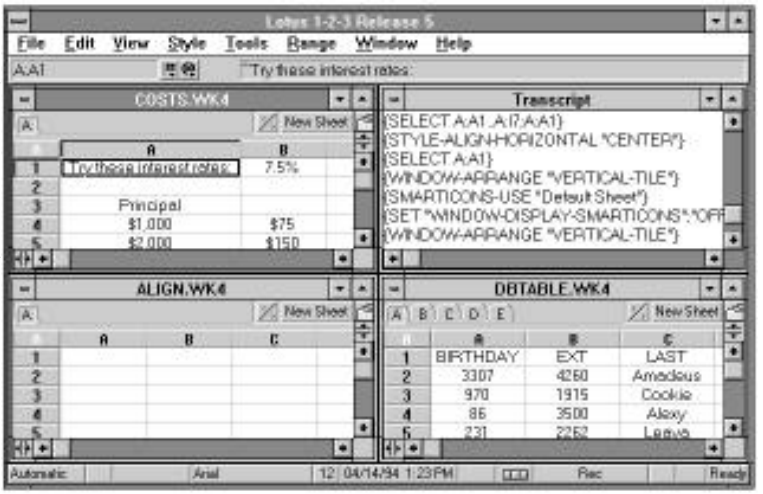
1. Choose Window Cascade.




## To tile windows

When you **tile** windows, 1-2-3 arranges them side-by-side like floor tiles with the active window in the top left corner.

1. Choose Window Tile.



# 5 Using 1-2-3 Commands

This chapter describes different ways to perform a command in 1-2-3 for Windows. You can use the menus, the keyboard, or 1-2-3 Classic. This chapter also describes how to cancel a command and undo a command or other action.

> **Note** You can also perform a command by clicking SmartIcons and by using the status bar. For information about using SmartIcons, see page 36. For information about what you can do with the status bar, see page 39.

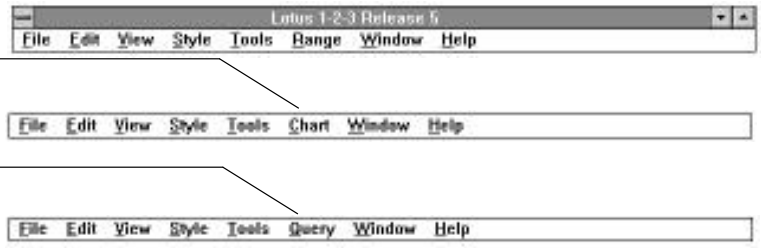
## Using main menu commands

Commands appear in the **main menu**, directly below the title bar. You choose **commands** from the menu to perform actions in 1-2-3. The commands in the main menu change depending on your current selection, as shown below.

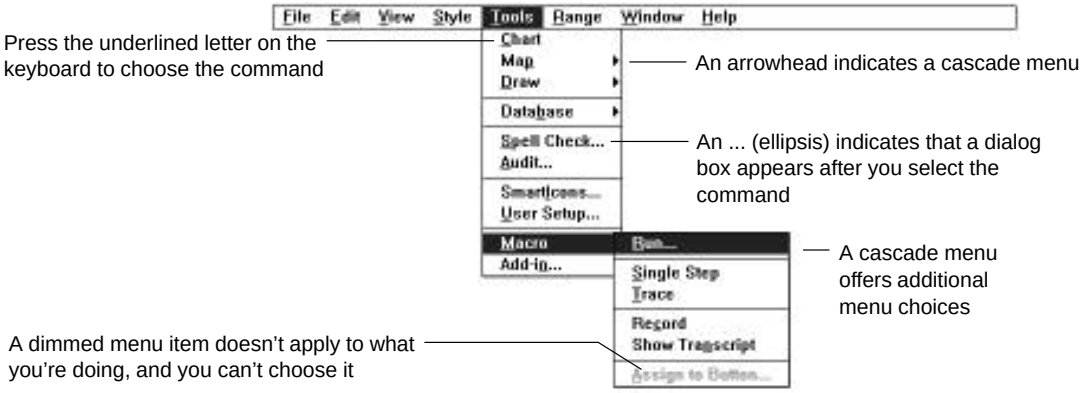
When you select a range, the menu displays the Range command

When you select a chart, the menu displays the Chart command

When you select a query table, the menu displays the Query command




When you choose a command in the main menu, a **pull-down menu** appears listing additional commands you can choose. For example, when you choose Tools from the main menu, you see the Tools pull-down menu, as shown on the next page.




When you choose a command not followed by an ... (ellipsis) or an arrowhead, 1-2-3 performs the command immediately. For example, when you select a range and choose Tools Chart, the mouse pointer changes to a chart pointer so that you can create a chart without displaying any additional commands or a dialog box.

## To choose a main menu command

1. Highlight the top-level command in the menu:

   **Mouse** Click the command to make the pull-down menu appear.

   **Keyboard** Press **ALT** and the underlined letter of the command (usually the first letter); or press **F10 (MENU)**, use → and ← to move the menu pointer, and press **ENTER** when the command is highlighted.

   The pull-down menu appears. For example, to choose File from the 1-2-3 main menu, click File or press **ALT** and press f. The File pull-down menu appears.

2. Choose the command from the pull-down menu:

   **Mouse** Click the command.

   **Keyboard** Press the underlined letter of the command or use ↑ and ↓ to move up and down in the pull-down menu. Press **ENTER** when the command is highlighted.

   For example, to choose Open from the File pull-down menu, click Open or press o. The Open File dialog box appears.

3. If a dialog box appears, use the dialog box as described on page 50. If there's a cascade menu, choose a command from the cascade menu:

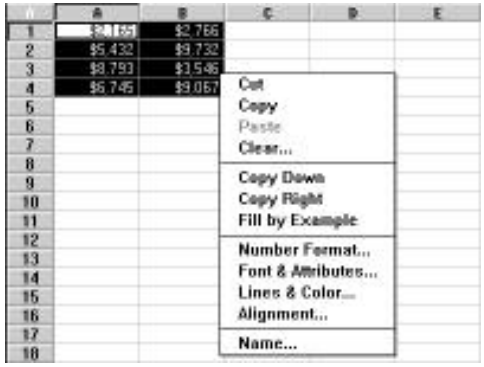
   **Mouse** Click the command.

   **Keyboard** Press the underlined letter of the command or use ↑ and ↓ to move up and down in the cascade menu. Press **ENTER** when the command is highlighted.

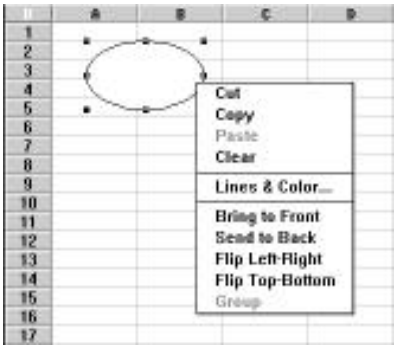
The rest of this book condenses these three steps into one. For example, instead of separately listing each menu choice for opening a file (Choose File, then choose Open), a single step says Choose File Open.

## Using 1-2-3 quick menus

Pressing the right mouse button is a convenient and quick way to display a menu containing useful commands for working with the current selection. For example, if you select a range and then press the right mouse button, you see a menu containing commands appropriate for working with ranges.




If you select a drawn object and then press the right mouse button, you see a menu containing commands appropriate for working with drawn objects.

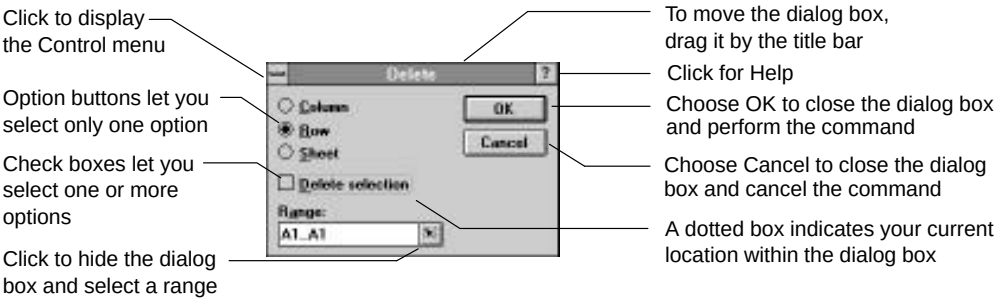


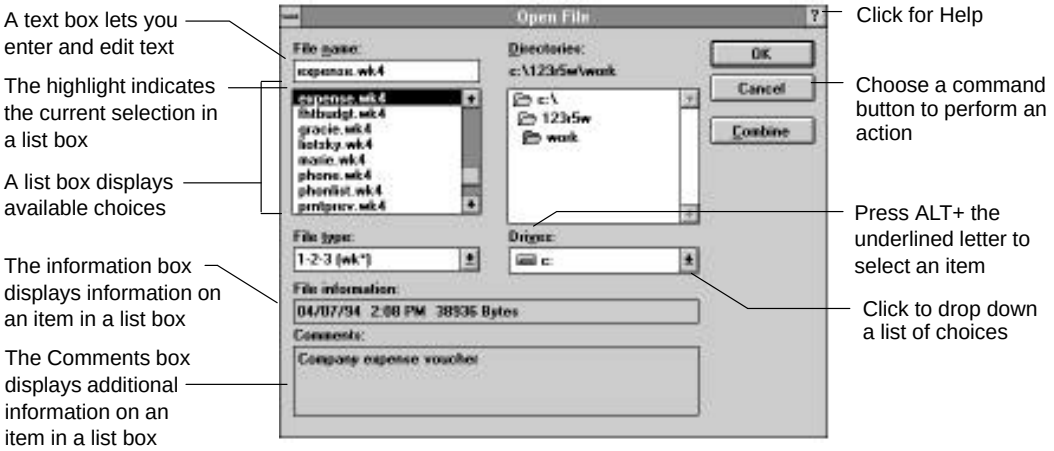

You can press the right mouse button to display a menu for many different worksheet items, such as query tables, charts, chart elements, and embedded objects.

## Using a dialog box

*You can move a dialog box like any other window if it blocks data you want to see.*

You use a **dialog box** to select options and identify data you want a command to work on. In a dialog box, you can select an option, select check boxes, enter text in a text box, and select an item from a list or drop-down box. You may need to do all these actions or only one of them. When you're done, you either complete the command or cancel it. The next illustrations show what you can do with the various parts of a dialog box.






Some dialog box options change depending on the current selection. For example, if you select a range and then choose Style Lines & Color, the dialog box displays options appropriate to working with ranges. If you select a chart and then choose Style Lines & Color, you see different options appropriate for working with charts.

## Dialog box options

The following table describes how to complete dialog options using the mouse or the keyboard.

| *Dialog box option* | *With the mouse* | *With the keyboard* |
|---|---|---|
| Select an option button | Click the button of the option you want. | Hold down **ALT** and press the underlined letter in the option button name; or press **TAB** or **SHIFT+TAB** to move the dotted box to a group of option buttons and use ↑, ↓, →, ← to select the button of the option. |
| Select a check box | Click the check box. | Hold down **ALT** and press the underlined letter in the check box name; or press **TAB** or **SHIFT+TAB** to move the dotted box to a check box and press **SPACEBAR**. |
| Enter text in a text box | Click the text box and type the text. | Hold down **ALT** and press the underlined letter in the text box name; or press **TAB** or **SHIFT+TAB** to move to the text box. Then type the text. |

*Continued*

| *Dialog box option* | *With the mouse* | *With the keyboard* |
|---|---|---|
| Enter a range in a text box | Click the text box; select the range in the worksheet. To specify a collection, **CTRL**+click the range selector after you specify the first range. | Hold down **ALT** and press the underlined letter in the text box name; or press **TAB** or **SHIFT+TAB** to move to the text box. Type the range name or address; or select the range in the worksheet using ↑, ↓, →, ← and then press **ENTER**. To specify a collection, type a ; (semicolon) between each range address. |
| Select an item from a list box | Click the item. If you don't see the item you want in the list box, click the scroll arrows or drag the scroll box until your choice appears. | Hold down **ALT** and press the underlined letter in the list box name; or press **TAB** or **SHIFT+TAB** to move to the list box. Press the first letter of the item you want, or use ↑, ↓, →, ← to scroll to the item. Press **ENTER**. |
| Select an item from a drop-down box | Click the arrow to drop down the list; click the item you want. | Hold down **ALT** and press the underlined letter in the drop-down box name; or press **TAB** or **SHIFT+TAB** to move to the drop-down box. Press **ALT+**↓ to drop down the list. Press the first letter of the item you want, or press ↑ or ↓ to move to the item. Press **ALT+**↑ to choose the item you want and close the drop-down box. |
| Complete a dialog box command | Click OK. | Press **ENTER.** |

## Canceling a command

At any point, while you're making a menu choice or using a dialog box, you can cancel the command. Click anywhere outside the menu, or click the Cancel button in the dialog box. You can also press **ESC** or **CTRL+BREAK** to cancel a command.

When you cancel a command, 1-2-3 closes the dialog box or menu without completing the command and returns the worksheet to the condition it was in before you chose the command.

> **Note** If a dialog box has a Close button instead of a Cancel button, you can't cancel commands that you perform with the dialog box. For example, once you name a range, you can't cancel the command.

## Undoing an action

You can often undo a command or other action by performing Undo immediately before doing anything else. For example, you can undo the effects of editing a cell or moving data.

Choose Edit Undo or press **CTRL+Z**.

You can't undo Print commands, File commands that write to disk, cell-pointer movements, pressing **F5 (GOTO)**, **F6 (PANE)**, or **F9 (CALC)**. You also can't use Undo to reverse a previous use of Undo.

> **Note** If you chose to turn off Undo when you installed 1-2-3, you can turn it on by choosing Tools User Setup and selecting the Undo option. If Undo is turned off, you can't undo a command or other action.

## Using 1-2-3 keys

You can use the keyboard to perform some 1-2-3 commands and other actions. Keyboard shortcuts perform tasks you can also perform with a menu command. Function keys perform different actions depending on whether you press only the function key or hold down **ALT** or **CTRL** while pressing the function key.

> **Help** For information about keyboard shortcuts, function keys, Control menu keys, dialog box keys, editing keys, Help keys, and special keys, choose Help Keyboard.

## Using 1-2-3 Classic

*You can drag the 1-2-3 Classic window to a different location in the 1-2-3 window.*

1-2-3 Classic lets you use the 1-2-3 Release 3.1 menu or the Wysiwyg menu. When you press / (slash) or < (less-than symbol) in Ready mode, the 1-2-3 Classic window appears at the top of the 1-2-3 window. The 1-2-3 Release 3.1 main menu appears in the 1-2-3 Classic window.

To use the Wysiwyg menu, press : (colon) in Ready mode. 1-2-3 displays the Wysiwyg menu in the 1-2-3 Classic window.

You can work with the 1-2-3 Release 3.1 main menu or Wysiwyg menu just as you do in 1-2-3 Release 3.1. When you complete a command or press **ESC**, the 1-2-3 Classic window disappears.

**Note** You can't use the mouse to choose commands in the 1-2-3 Classic window.

**Help** For more information on using 1-2-3 Release 3.1 commands in 1-2-3 Release 5 for Windows, choose Help For Upgraders and select the topic "1-2-3 Classic." Also, if you highlight a command in 1-2-3 Classic and press **F1 (HELP)**, Help points you to the equivalent 1-2-3 Release 5 for Windows command.

# 6 Worksheet Basics

This chapter describes how to perform basic worksheet and file tasks, such as opening and saving a file, displaying file information, inserting and deleting worksheets, naming worksheets, and moving around in worksheets and files.

## Opening a file

When you start 1-2-3, the Welcome to 1-2-3 dialog box lets you choose whether you want to create a new file or open an existing file. Once you are working in 1-2-3, you use File New to open a new file and File Open to open an existing file. You can open and work with several files at a time. Open files are called **active files**, and the file containing the cell pointer is the **current file**.

The 1-2-3 Release 5 for Windows default file type is .WK4. You can also open files from other releases of 1-2-3 and Symphony®, and Microsoft Excel. For details about opening and saving other types of files, see Appendix A.

If you don't want 1-2-3 to display the Welcome to 1-2-3 dialog box each time you begin a session, select "Don't show this screen again." If you change your mind, choose Tools User Setup and deselect "Skip Welcome dialog box."

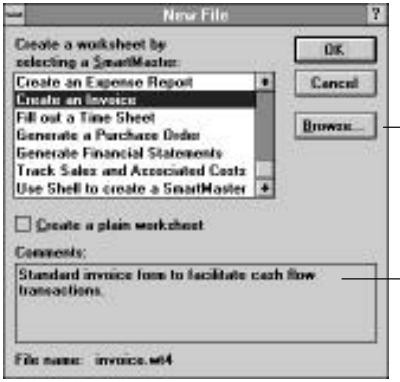
## SmartMaster templates

When you create a new file, you can choose to use a **SmartMaster**. A SmartMaster gives you a quick start for creating attractive, useful spreadsheets. Each SmartMaster provides you with a template for common business and financial tasks. Sample data and instructions in the SmartMaster show you how it works. You can customize SmartMaster templates or design your own SmartMaster templates using the Shell SmartMaster.

## To create a new file

*Before you create a file using a SmartMaster, make sure that the Tools User Setup "Skip New File" and "Skip Welcome Screen" options are deselected and the "Run autoexecute macros" option is selected.*

1. Choose File New.




Displays templates stored in other directories

Displays information about the selected SmartMaster

2. Select a SmartMaster from the list or select the "Create a plain worksheet" check box.
3. Choose OK.

**Shortcut** To create a plain worksheet, click the icon shown at left.

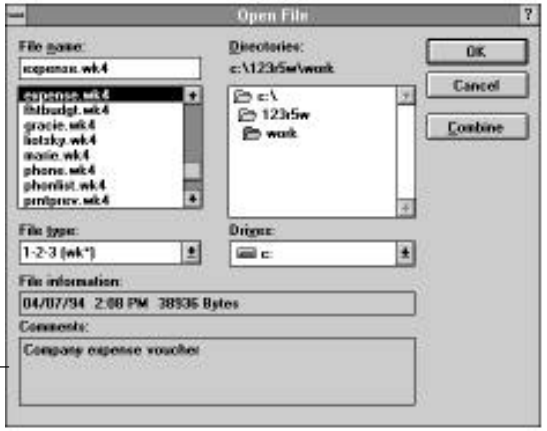
1-2-3 creates a new file, gives it a default file name, and displays it in a Worksheet window. The first default file name is FILE0001.WK4, the next default name is FILE0002.WK4, and so on. 1-2-3 increases the number in the file name by one for each new file that uses the default name.

After creating a new file and working in it, you may want to save your work and name the file. For more information, see “Saving a file” on page 66.

## To open existing files

*You can open recently used 1-2-3 files directly from the File menu. These files appear last on the File menu. You can choose how many files to show with Tools User Setup.*

1. Choose File Open or press **CTRL+O**.




Displays information about the selected file

*If you entered comments about a file, they appear in the Comments box, as you select files. You can create comments with either File Doc Info or File Save As.*

2. To see a list of files of a particular type, select the type of file you want from the File type drop-down box.
3. Specify the file or files you want to open by doing one of the following:
   - Use the File name and Directories list boxes, and the Drives drop-down box to select the file or files you want to open. To select more than one file, hold down the **CTRL** key and click the files that you want to open.
   - Enter the file name in the File name text box. To open multiple files, leave a space between each file name.

   **Note** If you select multiple files to open and more than one file contains an autoexecute macro, 1-2-3 runs the autoexecute macro only in the last file that opens that contains an autoexecute macro.
4. Choose OK.

1-2-3 opens the file or files in a Worksheet window and makes the last file opened the active window. Other windows remain open.

**Note** If the file you want to open is password-protected, 1-2-3 asks you to enter the password. For more information about file passwords, see page 155.

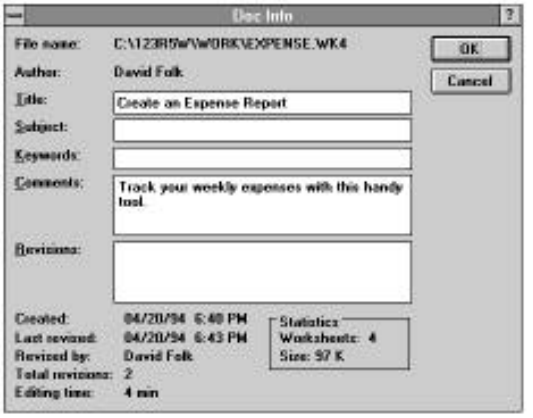
If someone else is using the file and has the file reservation, 1-2-3 asks whether you want to open the file with read-only access.

**Help** For information about file reservations, search on "Reservation" in Help. For information about how to combine data from a file on disk with data in the current file, search on "Combining files" in Help.

## Displaying file information

1-2-3 lets you keep track of useful information about individual files, whether you work on the files alone or share them with other people. You can include keywords and comments about a file, in addition to a title and subject. You can use keywords to share information with Lotus Notes through Notes/FX.

1-2-3 also tracks who created and last modified each file, the date of the last revision, the total number of revisions, and the amount of time spent editing the file. To display information about the current file, choose File Doc Info.




**Help** For more information, search on "Document information" in Help. To find out how to share information with Lotus Notes, search on "Notes/FX" in Help.

## Inserting and deleting worksheets

You can insert worksheets before or after the current worksheet. You can insert up to 255 worksheets, depending upon available memory and the number of worksheets in other active files.

**Note** You can insert and delete columns, rows, and ranges as well as worksheets. For information, see page 90.

### To insert one worksheet at a time

Using the New Sheet button is the quickest way to insert one worksheet at a time. A click of this button inserts one worksheet immediately after the current worksheet.

1. Click the New Sheet button shown at left.

### To insert a specified number of worksheets

Using Edit Insert, you can insert a specified number of worksheets immediately before or after the current worksheet. This method is convenient when you want to insert many worksheets and don't want to click the New Sheet button over and over. It's also the only way to insert worksheets before the current worksheet.

1. Choose Edit Insert.
2. Select Sheet.
3. Select Before or After.
4. In the Quantity text box, click the arrows or enter the number of worksheets you want to insert.
5. Choose OK.

**Shortcut** Select a range that includes cells in the same number of worksheets that you want to insert. Then, click the icon shown at left to insert the worksheets after the last worksheet in the selection.

### To delete a worksheet

1. Select at least one cell in each worksheet you want to delete.

   For example, to delete worksheets B, C, and D, select cells B:A1..D:A1. If you're not sure how to select a range across worksheets (a 3D range), see page 71.
2. Choose Edit Delete.
3. Select Sheet.
4. Choose OK.

*To delete a single worksheet, click the worksheet letter and choose Edit Delete.*

When you delete worksheets, 1-2-3 automatically changes the letters of the remaining worksheets and adjusts formulas. For example, if you have four worksheets in a file, and you delete worksheet A,

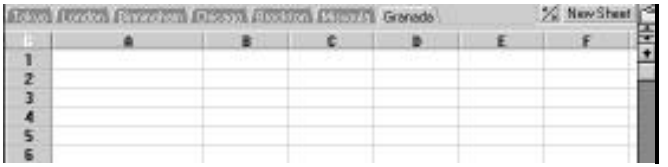
1-2-3 changes the remaining three worksheets to A, B, and C. For more information about how 1-2-3 adjusts formulas, see "How inserting and deleting affects formulas" on page 92.

**Shortcut** Select the worksheet letter for the worksheet you want to delete, and click the icon shown at left. To delete multiple contiguous worksheets, select the worksheet letter for the first worksheet you want to delete, hold down the **SHIFT** key and click the worksheet letter for the last worksheet that you want to delete, and then click the icon shown at left.

**Help** For information about deleting an entire file, search on "Deleting files" in Help.

## Naming worksheets

You can name a worksheet using its worksheet tab. Initially these tabs display the worksheet letter, such as A, B, C and so on. You can enter names in worksheet tabs, as shown below.




Use the following guidelines when you name worksheets:

- Worksheet names can be up to 15 characters long.
- Don't use a worksheet name that's the same as the worksheet letters; for example, don't name a worksheet A or BB.
- You can enter names in uppercase letters, lowercase letters, or a combination.
- You can use letters, numbers, and _ (underscores) in worksheet names, but don't start a worksheet name with a number.
- Don't start a worksheet name with ! (exclamation point), $ (dollar sign), or @ (at sign), and don't include , (comma), ; (semicolon), . (period), : (colon), or the characters +, –, *, /, &, >, <, #, (, ), ∧, or =.
- Don't use @function names, macro command keywords such as BEEP, or the names of keys, such as **HOME**.
- Don't create names that look like cell addresses, such as Q2 for Quarter 2, or FY94 for Fiscal Year 1994.

- You can't enter duplicate worksheet names in the same file. If you try to enter a worksheet name that's the same as another in the file, 1-2-3 beeps and displays a message.

When referring to a range in a formula or @function, you can use a worksheet name in place of a worksheet letter. For example, if the name of worksheet B is Tokyo, you can refer to cell B5 in that worksheet as Tokyo:B5.

If a worksheet has a name, 1-2-3 converts worksheet letters in formula references to the corresponding worksheet names. For example, if the name of worksheet A is Chicago, 1-2-3 converts +A:A5–B:A3 to +Chicago:A5–B:A3.

### To name a worksheet

1. Double-click the worksheet tab.
2. Enter the name.
3. Press **ENTER**.

The name appears in the worksheet tab.

**Help** 1-2-3 can also name worksheets automatically. For more information, search on "Naming worksheets" in Help.

### To delete a worksheet name

1. Double-click the worksheet tab.
2. Press **DEL** or **BACKSPACE**.
3. Press **ENTER**.

The worksheet letter appears in the worksheet tab.

### To hide or show worksheet tabs

1. Do one of the following:
   - Click the Tab button, shown at left.
   - Choose View Set View Preferences; under "Show in current file," select or deselect the Worksheet tabs check box, and choose OK.

## Moving around a file

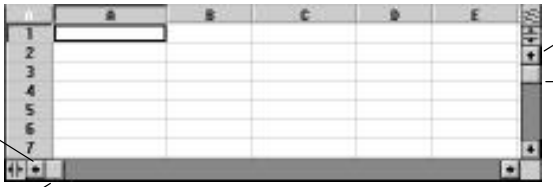
You can use the mouse or keyboard to move the cell pointer around in a single worksheet, or from one worksheet to another. To move the cell pointer in a single worksheet, click the cell you want to move to; or use ↑, ↓, →, ←, or other pointer-movement keys. You can also use scroll bars to see data not currently in view without moving the cell pointer.

To move from one worksheet to another, click the tab of the worksheet you want to move to, or use the worksheet navigation keys. Also, you can use the navigator to go to named ranges in the current file; see page 96 for more information.

**Help** For more information about using the pointer-movement keys, choose Help Keyboard, and then choose the Pointer-Movement Keys topic.

## Using the scroll bars

Dragging the scroll boxes in the horizontal and vertical scroll bars, or clicking the scroll arrows, lets you see data not currently in view without changing the current selection. As you drag the vertical or horizontal scroll box, the selection indicator shows the row number or column letter so you can tell how far you've scrolled.




The table below describes how to move around the current worksheet using the mouse and scroll bars.

| *Do this* | *To scroll the worksheet* |
|---|---|
| Click the up or down scroll arrow | Up or down one row |
| Click the left or right scroll arrow | Left or right one column |
| Click the horizontal scroll bar to the left or right of the scroll box | One full screen to the left or right |
| Click the vertical scroll bar above or below the scroll box | One full screen up or down |

*Continued*

| *Do this* | *To scroll the worksheet* |
|---|---|
| Drag the scroll box in the horizontal scroll bar | To any position left or right |
| Drag the scroll box in the vertical scroll bar | To any position up or down |
| Drag the scroll boxes to the far left of the horizontal scroll bar and to the top of the vertical scroll bar | To cell A1, if column A isn't hidden and worksheet titles aren't set |

## Moving from one worksheet to another

You can move the cell pointer from one worksheet to another using the mouse or the keyboard. To move from one worksheet to another using the mouse, click the tab of the worksheet you want to move to.

To move from one worksheet to another using the keyboard, you use the worksheet navigation keys.

**Help** For more information about using the worksheet navigation keys, choose Help Keyboard, and then choose the Worksheet Navigation Keys topic.

## Moving to another file

To move among active files, click a cell in the file you want to move to, or choose Window and select the file name. You can also use the file navigation keys on the keyboard to move the cell pointer from one active file to another.

**Help** For more information about using the file navigation keys, choose Help Keyboard, and then choose the File Navigation Keys topic.

## Viewing worksheets

In a multiple-sheet file, you can view three worksheets at the same time by splitting the worksheet window into perspective view. You can also split a worksheet into vertical or horizontal panes, and zoom a worksheet to magnify or shrink the display.

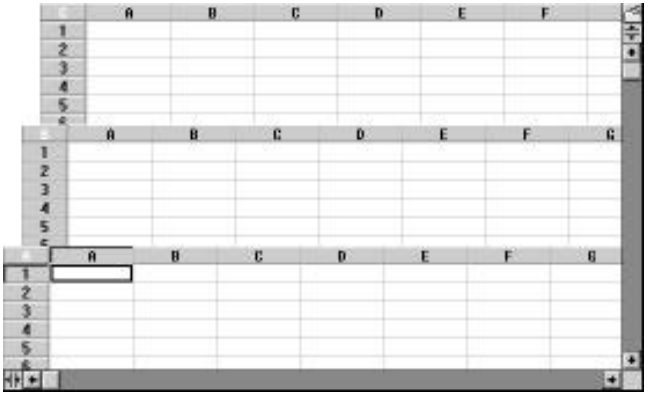
**Help** For more information about splitting a worksheet into panes, search on "Panes" in Help.

## To view worksheets in perspective

1. Choose View Split.
2. Under Type, select Perspective.
3. Choose OK.

**Shortcut** Click the icon shown at left to switch to perspective view.

The illustration below shows a Worksheet window in perspective view with worksheets A, B, and C displayed simultaneously. Worksheet tabs aren't available in perspective view.



To move from one worksheet to another, use the icons shown at left, or press **CTRL+PG UP** or **CTRL+PG DN**. You can also press **F6 (PANE)**. To return to single-sheet view from perspective, choose View Clear Split.

## To zoom a worksheet

1. Do one of the following:
   - To magnify the worksheet display, choose View Zoom In.
   - To decrease the worksheet display, choose View Zoom Out.

   Each time you choose View Zoom In or View Zoom Out, 1-2-3 magnifies or shrinks the display of the worksheet by 10%.

Choose View Custom to return to the default display size specified in View Set View Preferences.

## Freezing rows and columns as titles

You can freeze rows or columns so they remain visible as you scroll through the worksheet. This is convenient when you're scrolling through a large worksheet because you can always see the headings that describe the data. Rows and columns that you freeze this way are called **frozen titles**.

Freeze this row...

... and this column...

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | STUDENTS | Jan | Feb | Mar | Apr |
| 2 | Albers | 78 | 75 | 70 | 83 |
| 3 | Bowers | 90 | 73 | 79 | 82 |
| 4 | Bznowski | 78 | 77 | 75 | 77 |
| 5 | Carloff | 87 | 85 | 93 | 72 |
| 6 | Crome | 68 | 85 | 79 | 70 |
| 7 | Delly | 77 | 90 | 88 | 60 |
| 8 | Dow | 75 | 72 | 83 | 83 |
| 9 | Dnieper | 83 | 77 | 82 | 87 |
| 10 | Dragonoff | 85 | 87 | 83 | 78 |

... to keep them in view as you scroll

| | A | G | H | I | J |
|---|---|---|---|---|---|
| 1 | STUDENTS | June | Jul | Aug | Sep |
| 2 | Albers | 82 | 74 | 78 | 87 |
| 3 | Bowers | 84 | 91 | 68 | 68 |
| 4 | Bznowski | 79 | 78 | 78 | 90 |
| 5 | Carloff | 60 | 95 | 78 | 65 |
| 6 | Crome | 83 | 68 | 95 | 81 |
| 7 | Delly | 87 | 88 | 86 | 75 |
| 8 | Dow | 78 | 82 | 73 | 83 |
| 9 | Dnieper | 91 | 85 | 68 | 85 |
| 10 | Dragonoff | 55 | 82 | 90 | 87 |

You can freeze rows or columns as titles, or both. Although you can set as many rows and as many columns as you want as titles, it's a good idea to set only a few, so you can still see all the data you want to work with.

## To freeze rows and columns as titles

1. Do any of the following:
   - To freeze rows, move the cell pointer one cell below the rows you want to freeze.
   - To freeze columns, move the cell pointer one cell to the right of the columns you want to freeze.
   - To freeze both rows and columns, move the cell pointer to the cell immediately below the rows and to the right of the columns you want to freeze.
2. Choose View Freeze Titles.
3. Select Rows, Columns, or Both.
4. Choose OK.

To clear frozen titles, choose View Clear Titles.

**Help** For information about editing frozen titles, search on "Titles" in Help.

## Grouping worksheets

When you group worksheets, 1-2-3 applies the following styles and settings in the current worksheet to all other worksheets in the file: number formats, fonts and text attributes, colors, alignments, row height, column width, protection settings, frozen titles, and page

breaks. After grouping worksheets, if you change any of these settings in one worksheet, *all* the worksheets change.

*To see how commands and actions affect data in grouped worksheets, view them in perspective.*

Grouping worksheets is a convenient way to make all the worksheets in a file look the same. For example, suppose you're setting up a multiple-sheet file so that each worksheet contains expense figures for a different month. When creating the file, you can style one worksheet in the file; then, with the cell pointer in that worksheet, group worksheets to apply the same styles to all other worksheets. Before entering data, you can ungroup the worksheets.

**Caution** You can lose data if you forget that worksheets are grouped. For example, if you delete a column or row in one worksheet, you delete it in all grouped worksheets. Also, don't group worksheets if you want to keep styles or other settings unique to a particular worksheet. Ungrouping does *not* restore the styles and settings applied to a worksheet before grouping.

### To group worksheets

1. Choose Style Worksheet Defaults.
2. Under Other, select the Group mode check box.
3. Choose OK.

The Group indicator appears in the status bar.

### To ungroup worksheets

1. Choose Style Worksheet Defaults.
2. Deselect the Group mode check box.
3. Choose OK.

The Group indicator disappears from the status bar.

## Saving a file

The data you enter in a worksheet is temporary until you save it. It's a good idea to save a file frequently as you work on it. This way, you have a recent copy on disk and, in case of a power failure or other accident, you won't lose much data.

You can save your worksheets in a variety of file formats for use with other applications. For more information, see Appendix A.

**Help** You can save 1-2-3 files automatically at a time interval you specify using Tools User Setup. For more information, search on "Autosave" in Help.

## To save a file

1. Make sure the cell pointer is in the file you want to save.
2. Choose File Save As.

*If you previously saved the file, you can choose File Save to save the current file without changing the file name and without using a dialog box.*

3. Accept the default file name, or specify a new name in the File name text box.

   A file name can contain up to eight characters. You can use any combination of letters, numbers, _ (underscores), and - (hyphens). Since 1-2-3 isn't case-sensitive for file names, you can use any combination of uppercase and lowercase letters.
4. If you want, specify a different drive or directory using the Drives drop-down box and the Directories list box.

**Help** For more information about naming a file, search on "Naming files" in Help.

5. If you want, enter comments describing the file in the Comments text box. These comments appear in the Open File dialog box when you select the file, and in the Doc Info dialog box. For more information about Doc Info, see "Displaying file information" on page 58.
6. Choose OK.

If you specified a file name that already exists, 1-2-3 asks whether you want to cancel saving the current file, replace the data in the existing file with the data in the current file, or create a backup of the existing file before replacing data in it.

**Note** For information about saving a file with a password, see "Preventing others from opening a file" on page 155.

**Help** You can extract data from the current file by saving it as a file on disk. To extract data, select the "Selected range only" check box in the Save As dialog box. For more information about extracting data, search on "Extracting data" in Help.

## Closing a file

When you finish working in a file, it's a good idea to close it. Closing files you're not using saves memory and keeps your workspace from getting cluttered.

### To close a file

*You can also close a file by pressing* **CTRL+F4**.

1. Make sure that the cell pointer is in the file you want to close.
2. Choose File Close, or double-click the Control menu box of the Worksheet window.

If you changed the file but didn't save the changes before closing, 1-2-3 indicates that the file has changed and asks whether you want to save the changes before closing.

# 7 Selecting Worksheet Areas

Selecting an area of the worksheet tells 1-2-3 what part of the worksheet you want your next action to affect. A selection can be as small as a single cell or as large as all the cells in all the worksheets in the file. This chapter describes how to select ranges, collections, columns, rows, and worksheets.

## Selecting a single cell

The rectangular highlight in the worksheet is the **cell pointer**. The cell pointer marks the **current cell**. To enter data in a cell or perform a command on a cell, you must make it the current cell. You select a cell by moving the cell pointer there. 1-2-3 depresses the current cell's row number and column letter, and the selection indicator displays the address of the selected cell.

Cell address appears in the selection indicator

The current cell

A **cell address** consists of a worksheet letter followed by : (colon), a column letter, and a row number. If you're referring to an address in the current worksheet, you can leave out the worksheet letter. For example, you can refer to A:A2 as A2 when worksheet A is the current worksheet.

### To select a single cell

*If you change to perspective view (described on page 64), you can click a cell in any visible worksheet.*

**Mouse**

1. Click the cell.

**Keyboard**

1. Press ↑, ↓, →, ←, or other pointer-movement keys to move the cell pointer to the cell. If the cell is in another worksheet, use **CTRL+PG UP** or **CTRL+PG DN** to display the worksheet, and then move the cell pointer to the cell.

## Selecting a range

A **range** is a block of cells that can be as small as a single cell or as large as all the cells in all the worksheets in a file. A **range address** consists of the addresses of the first and last cells in the range, separated by two periods. For example, the address of the range shown below is A:A2..A:C4.

Range address in the selection indicator

Range A:A2..A:C4

You can select a range contained entirely in a single worksheet or a range that spans two or more adjacent worksheets in a single file, a **3D range**. For example, the 3D range A:A2..C:C4 spans three worksheets.

The easiest way to make a command work on a range is to select the range before choosing a command. You can also select a range from a dialog box. For more information about selecting a range from a dialog box, see "Using a dialog box" on page 50.

### To select a range

*A quick way to select a range is to click the first cell and* **SHIFT**+*click the last cell; or hold down* **SHIFT** *and press* ↑, ↓, →, ← *to highlight the range.*

1. Point to a cell in one corner of the range:

   **Mouse** Move the mouse pointer to the cell.

   **Keyboard** Press ↑, ↓, →, ←, or the other pointer-movement keys to move the cell pointer to the cell.

2. Anchor the cell pointer:

   **Mouse** Press and hold the mouse button.

   **Keyboard** Press **F4**.

3. Highlight the range:

   **Mouse** While holding down the mouse button, drag across the worksheet. Release the mouse button when the range you want is highlighted.

   **Keyboard** Press ↑, ↓, →, ← until you have highlighted the range you want. Press **ENTER**.

## To select a 3D range with the mouse

1. Move the cell pointer to one corner of the range in the first worksheet.

   For example, click cell A:A2.

2. Drag across the worksheet and release the mouse button when you've highlighted the range you want.

   For example, highlight A:A2..A:C4.

3. Extend the selection to the last worksheet in the range by holding down **SHIFT** and clicking the worksheet tab.

   For example, hold down **SHIFT** and click the tab for worksheet C, highlighting the 3D range A:A2..C:C4.

## To select a 3D range with the keyboard

*To see the file in perspective view, choose View Split, select Perspective, and choose OK.*

1. Press ↑, ↓, →, ←, or other pointer-movement keys to move the cell pointer to one corner of the range in the first worksheet.

   For example, move the cell pointer to cell A:A2.

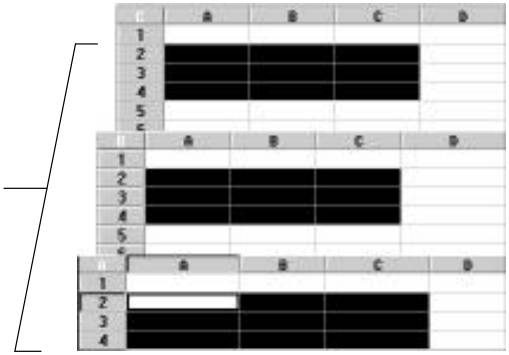
2. Anchor the cell pointer by pressing **F4**.

3. Highlight the range in the first worksheet by pressing ↑, ↓, →, ←.

   For example, highlight A:A2..A:C4.

4. Move to the last worksheet in the range by pressing **CTRL+PG UP** or **CTRL+PG DN**. Press **ENTER** to highlight the entire 3D range.

   For example, after highlighting A:A2..A:C4, press **CTRL+PG UP** twice to move to worksheet C, and press **ENTER** to highlight the range A:A2..C:C4, as shown below.



The 3D range A:A2..C:C4 in perspective view

## To reshape a selection

**Mouse**

1. Hold down **SHIFT** and click any cell, or hold down **SHIFT** and drag to any cell to extend or shrink the selection to that cell.

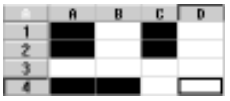
**Keyboard**

1. Press **F4** or hold down **SHIFT**, and press ↑, ↓, →, ←, **CTRL+PG UP** or **CTRL+PG DN** to extend or shrink the selection.

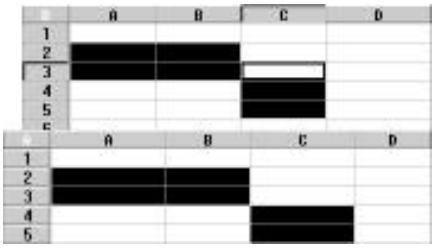
   Press → and ← to extend the selection one column to the right or left; press ↑ and ↓ to extend the selection one row up or down. Use **CTRL+PG UP** and **CTRL+PG DN** to extend the selection one worksheet forward or back.

## Selecting a collection

A **collection** contains more than one range on one or more worksheets. The ranges in a collection can touch, not touch, or overlap. You can use most of the Edit commands and Style commands on collections.



A collection's address consists of the addresses of all the ranges in the collection separated by , (commas) or ; (semi-colons). For example, the address of the collection at left is A1..A2,A4..B4,C1..C2,D4..D4. The address of the 3D collection in the illustration below is A:A2..A:B3, A:C4..A:C5, B:A2..B:B3, B:C3..B:C5.



## To select a collection

1. Select the first range in the collection.
2. If necessary, display another worksheet by holding down **CTRL** and clicking the worksheet tab.
3. Hold down **CTRL** and click a cell or drag across the range you want to add to the collection.

   To remove a range from a collection, hold down **CTRL** and click the range you want to remove.
4. Repeat step 3 until you've selected the entire collection.

**Note** Using the mouse is the only way to select a collection.

## Selecting columns and rows

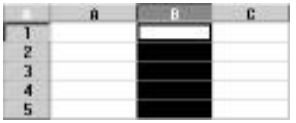
A **column** is a series of cells extending from the top to the bottom of the worksheet. A **row** is a series of cells extending from the left edge to the right edge of the worksheet. You can select a single column or row, a range of columns or rows, or a collection of columns or rows.

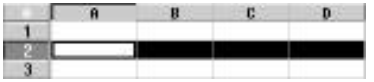
Some commands work specifically on columns or rows. For example, you can move or delete entire columns and rows. Select a column or row and press the right mouse button to see a menu of the most common commands that work on columns and rows.

**Note** Using the mouse is the only way to select entire columns and rows.

### To select a single column or row

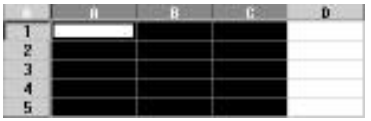
1. Click the column letter or row number.

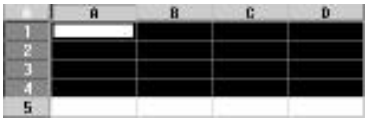



### To select a range of columns or rows

1. Do one of the following:
   - Point to the letter or number of the first column or row in the range; drag across the worksheet to the last column letter or row number; release the mouse button.
   - Click the letter or number of the first column or row in the range; if necessary, scroll to the last column or row in the range; **SHIFT**+click the last column letter or row number.



## To select a collection of columns or rows

1. Select the first column or row, or range of columns or rows in the collection.
2. If necessary, scroll to the next column or row you want to select.
3. Hold down **CTRL** and click the letter or number of the next column or row; or drag across column letters or row numbers to select the next range of columns or rows.
4. Repeat steps 2 and 3 until you've selected the entire collection of columns or rows.

## Selecting worksheets

Selecting a worksheet selects all the cells in the worksheet. The cell pointer moves to the first cell in a selected worksheet. The following table describes how to select worksheets with the mouse.

| *To select a* | *Do this* |
|---|---|
| Single worksheet | Click the worksheet tab. |
| Range of worksheets | Click the letter of the first worksheet in the range; hold down **SHIFT** and click the tab of the last worksheet in the range. |
| Collection of worksheets | Click the letter of the first worksheet in the collection; move to the next worksheet in the collection by holding down **CTRL** and clicking the worksheet tab; **CTRL+**click the worksheet letter. Repeat steps 2 and 3 until you've selected the entire collection of worksheets. |

# 8 Entering and Editing Data

You build a spreadsheet by entering data, such as numbers, text, dates, and times. You can edit data, copy it, and move it. You can also enter and edit data by inserting and deleting columns, rows, and ranges. After entering data, you can find and replace text, and check spelling. This chapter describes techniques for entering, editing, and checking data.

## Entering data

You can enter numbers, text, dates, times, formulas, and @functions. As you enter data, it appears in both the contents box and the current cell. Click in the contents box to enter data there, or select a cell to enter data directly in the cell. The insertion point, a | (vertical bar), appears where you're entering the data.

Entry appears in the contents box ...

... and in the cell

Mode indicator changes from Ready to Edit

When you enter data in the contents box, the box expands to the right until it reaches the edge of the window. Then it expands downward to display more characters, up to a limit of 512. When you enter and edit data directly in a cell, the cell expands to the right until it reaches the edge of the window and then begins to scroll.

Cancel Confirm

While you're entering data, 1-2-3 displays the Cancel and Confirm buttons in the edit line. You can click these buttons to cancel or confirm an entry. You can also confirm an entry by clicking another cell, or by pressing **ENTER**, or ↑, ↓, →, ← or the other pointer-movement keys.

*Enter data in a selected range quickly by pressing ENTER to move to the next cell in the range.*

When you click the Confirm button or press **ENTER** in a single-cell range, the cell pointer stays in the cell where you entered the data. When you press ↑, ↓, →, or ←, the cell pointer moves one cell in the direction of the arrow. When you enter data in a multiple-cell range or in a collection, pressing **ENTER** moves the cell pointer to the next cell in the current range.

If your entry is valid, 1-2-3 enters it in the cell, and the mode indicator changes to Ready. If your entry isn't valid, 1-2-3 beeps and places the insertion point where you made an error. The cell contents remain in the contents box or the cell until you correct or cancel the entry. To cancel an entry, click the Cancel button or press **ESC**.

## Entering numbers

Numeric entries are called **values**. Values can be numbers, formulas, or @functions. You can enter and calculate with numbers from $10^{-4931}$ to $10^{4932}$, but 1-2-3 can only display numbers from $10^{-99}$ to $9.99*10^{99}$. If 1-2-3 can't display a number, it displays *** (asterisks) instead. **Formulas** calculate or combine numbers and text. **@Functions** are built-in formulas that calculate with numbers and text. See Chapters 10 and 11 for information about entering formulas and @functions.

*To add a note to a value entry, type ; (semicolon) immediately after the entry and then type your note. The note appears in the contents box but not in the cell.*

When you enter numbers, 1-2-3 formats them automatically as Comma, Currency, Percent, or Scientific, depending on the symbols you use. For example, if you enter $37.00, 1-2-3 can tell from the $ (dollar sign) that you want this number to appear in Currency format. If you enter 37%, 1-2-3 can tell from the % (percent symbol) that you want this number to appear in Percent format. If you enter a plain number or a decimal, such as 7.875, 1-2-3 enters the number without thousands separators, percentage, or currency symbols.

If you don't want 1-2-3 to format your entries automatically, choose Tools User Setup and deselect the "Use Automatic format" check box.

### To enter numbers

1. Select the cell where you want to enter the number:

   **Mouse** Click the cell.

   **Keyboard** Use ↑, ↓, →, ←, or the other pointer-movement keys to move the cell pointer to the cell.

*If you make a mistake as you type, press* **BACKSPACE**. *You can also press* **ESC** *to delete the entire entry.*

2. Enter the number.

   Begin with a number from 0 to 9 or a decimal point. Start a negative number with – (minus sign).

3. Confirm the entry:

   **Mouse** Click the Confirm button or click another cell.

   **Keyboard** Press **ENTER** or ↑, ↓, →, ←.

If you enter a number with more than 15 decimals, 1-2-3 rounds it to 15 decimals. If a number appears in the form *n*E+*n*, or a number with decimal places appears rounded, or if you see *** (asterisks) in the cell, it means the entry is too long to fit in the column. 1-2-3 stores the entire entry in the cell but can't display it.

If the number is within the limits that 1-2-3 can display, you can see the number by widening the column. Double-click the column border to the right of the column letter. For more information on widening columns, see "Changing column width" on page 132. Also, you can change the appearance of the number by using Style Number Format. For more information, see "To change the number format of a range or collection" on page 124.

## Entering text

*By default, labels are left-aligned and values are right-aligned. You can use Style Alignment to change the alignment of labels and values.*

Text entries are called **labels**. In addition to letters, labels can contain numbers, or a combination of numbers and letters. For example, you can enter Victor Shing, or 201 Newbury Street, or $19,803 as labels.

If the first character you enter is a letter, 1-2-3 automatically precedes the entry with a **label-prefix character** to signal that the entry is a label. If you want to enter numbers as a label, you must start your entry with a label-prefix character.

For example, to enter 20,000 as a label, you must type a label-prefix character before typing 20,000. Each of the label-prefix characters has a different effect, as shown in the following table.

| *Label-prefix character* | *How the text aligns* | *Effect* |
|---|---|---|
| ' | Kathy | Left alignment |
| " | Kathy | Right alignment |

*Continued*

| *Label-prefix character* | *How the text aligns* | *Effect* |
|---|---|---|
| ^ | Kathy | Center alignment |
| \ | KathyKathyKathy | Label repeats |

## To enter text

*If you make a mistake as you type, press* **BACKSPACE**. *You can also press* **ESC** *to delete the entire entry.*

1. Select the cell where you want to enter the text:

   **Mouse** Click the cell.

   **Keyboard** Use ↑, ↓, →, ←, or the other pointer-movement keys to move the cell pointer to the cell.

2. Enter the text.

   If your entry doesn't start with a letter, be sure to begin the entry with a label-prefix character. You can use any of the label-prefix characters shown in the table above. You can enter up to 512 characters.

3. Confirm the entry:

   **Mouse** Click the Confirm button or click another cell.

   **Keyboard** Press **ENTER** or ↑, ↓, →, ←.

If the cells to the right of the label are blank, 1-2-3 displays the part of the label that overlaps those cells. If the label is too long to fit in the cell and the cell to the right contains data, 1-2-3 displays as much of the label as possible. To see the entire label, widen the column by double-clicking the column border to the right of the column letter. For more information on widening columns, see "Changing column width" on page 132.

## Entering dates and times

You can enter a date or time, for example April 9, 1948 or 11:10 PM, as either a label or a value. When you enter dates or times as labels, remember to enter a label-prefix character first, if the date or time begins with a number.

When you enter a date or time as a value, you can use it in calculations and change its appearance by changing its number format. For example, you can calculate the number of days between two dates, or quickly change the appearance of a date from 4/9/48 to 9-Apr-48. You can also use @functions, such as @DATE and @TIME, to enter dates and times and calculate with them.

1-2-3 automatically formats dates entered as 9-Apr-93, 9-Apr, or 4/9/93. 1-2-3 also automatically formats times entered in any of the standard time formats except hh.mm (hour.minutes).

If 1-2-3 doesn't automatically format a date or time when you enter it, a date or time number, such as 34068, appears in the cell. A **date number** is an integer that represents a date between January 1, 1900 and December 31, 2099. **Time numbers** are decimal numbers ranging from .0 (12:00:00 AM) to .9999884 (11:59:59 PM).

## To enter a date or time

1. Select the cell where you want to enter the date or time:

   **Mouse** Click the cell.

   **Keyboard** Use ↑, ↓, →, ←, or the other pointer-movement keys to move the cell pointer to the cell.

2. Enter the date or time.

   For example, you can enter @DATE(93,2,14), 14-Feb-93, @TIME(14,33,0), 14:33, or 2:33 PM.

3. Confirm the entry:

   **Mouse** Click the Confirm button or click another cell.

   **Keyboard** Press **ENTER** or ↑, ↓, →, ←.

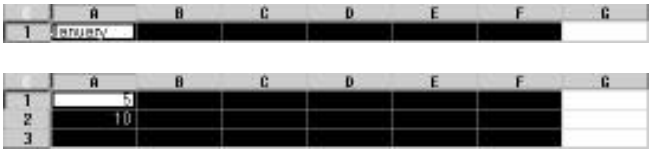
If a date or time number appears in the cell, you can change the appearance of the number by using Style Number Format. For more information, see "To change the number format of a range or collection" on page 124.

**Shortcut** Select the cell and click the icon shown at left to enter the current date in MM/DD/YY format.

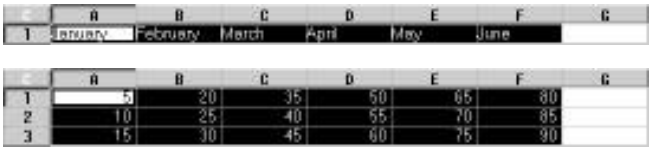
## Entering data automatically

You can automatically fill a range with a sequence of data based on what's already in the range. For example, if you enter a cell with the label January, 1-2-3 can automatically fill a range with February, March, April, and so on. The illustration below shows the effects of automatically filling ranges.

**Before**




**After**




You can use drag-and-fill or the Range Fill by Example command to automatically fill a range. Drag-and-fill is the quickest method, but if you want to fill a 3D range or a collection, you must use Range Fill by Example.

**Help** You can also fill a range automatically by using Range Fill to enter a sequence of numbers, dates, times, or percentages. For more information, search on "Filling ranges with values" in Help.

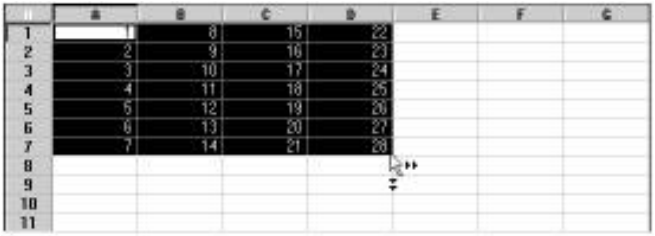
### To fill a range using drag-and-fill

1. Select the cell or range containing the data that's the basis for your fill sequence.

   **Caution** 1-2-3 writes over existing data in the fill range.

*If you drag past the edge of the range that you want to fill, you can use drag-and-clear to delete the extra data. Search on "Drag-and-clear" in Help for more information.*

2. Position the mouse pointer on the border of your selection at the lower right corner. You're ready to drag-and-fill when the mouse pointer changes from the arrowhead to the shape shown below.



3. Hold down the left mouse button and drag to select the range you want to fill.
4. Release the mouse button to fill the range.

## To fill a range by example

1. Select a range that includes the data you want to use as an example and the cells you want to fill.
   - To create a sequence that increments each entry by 1 (for example, January, February, March), make sure the first cell in the range contains the data you want 1-2-3 to use to calculate the sequence.
   - To create a sequence that increments each entry by a value other than 1 (for example, 5, 10, 15), make sure the first two cells in the range contain the data you want 1-2-3 to use to calculate the sequence.

     If 1-2-3 can't recognize the relationship between the data in the first two cells in the range (for example, Monday, February), it uses only the data in the first cell to calculate the sequence.

   **Caution** 1-2-3 writes over existing data in the fill range.

2. Choose Range Fill by Example.

1-2-3 fills the cells in the range from top to bottom in a column and from left to right in a row. If you specify a 3D fill range, 1-2-3 fills the range in the first worksheet, continues the sequence in the second worksheet, and so on until reaching the end of the range.

**Help** You can also create custom fill sequences. For more information, search on "Custom fill sequences" in Help.

## Editing data

To change data or correct mistakes, you can replace an entry entirely or edit it. To replace an entry, select the cell, type the new entry, and press **ENTER**. You can edit data directly in the cell, or in the contents box, or you can switch between them by clicking in either area. You can also delete data, find and replace text, and check your spelling.

### To edit in a cell

*You can also select characters by dragging across them; then press* **BACKSPACE** *or* **DEL** *to delete the selected characters, or enter new text to replace them.*

1. Double-click the cell you want to edit, or select the cell and press **F2 (EDIT)**.

   The insertion point appears in the cell. The cell contents also appear in the contents box.

2. Edit the entry.

   Press **BACKSPACE** to delete characters to the left of the insertion point, or press **DEL** to delete characters to the right. Then enter replacement characters. If necessary, you can use → and ← to scroll through the cell's contents.

3. Click the Confirm button or press **ENTER**.

### To edit in the contents box

*To highlight a word, double-click it.*

Editing in the contents box is convenient when the entry is wider than the window and would require a great deal of scrolling.

1. Select the cell you want to edit.

   The cell contents appear in the contents box.

2. Click the contents box at the point where you want to begin editing, or press **F2 (EDIT)**.

   The insertion point appears where you clicked in the contents box.

3. Edit the entry.

   Press **BACKSPACE** to delete characters to the left of the insertion point, or press **DEL** to delete characters to the right. Then enter replacement characters. If necessary, you can use → and ← to scroll through the entry in the contents box.

4. Click the Confirm button or press **ENTER**.

### To delete data

1. Select the range or collection.
2. Choose Edit Clear.
3. Select an option.

- "Cell contents only" deletes only cell contents, leaving all styles intact.
- Styles leaves the cell contacts intact and deletes number formats, text attributes, line styles and colors, alignment, background colors and patterns, and protection settings.
- Both deletes both cell contents and styles.

4. Choose OK.

**Shortcut** Click the trash can icon shown at left or press **DEL** to delete cell contents without displaying the dialog box. Click the eraser icon to delete styles without displaying the dialog box. You can also press **CTRL+DEL** to delete cell contents and styles without displaying the dialog box.

## To find and replace text

You can search through the cells in your worksheet to find and replace characters.

1. Choose Edit Find & Replace.

2. In the "Search for" text box, enter the characters you want to find.

   You can enter up to 512 characters.

3. Under Action, select the action you want 1-2-3 to perform.
   - Find highlights occurrences of the characters in the search area.
   - "Replace with" replaces occurrences of the characters with the characters you enter in the "Replace with" text box. Enter the replacement characters in the "Replace with" text box.
4. Under Include, select the kinds of entries you want to search.
   - Labels searches only in cells containing labels.
   - Formulas searches only in cells containing formulas.

- Both searches labels and formulas.

5. Under Search through, select All worksheets or Selected range.

   If you select Selected range, specify the range.

6. Choose OK.

   1-2-3 highlights the first occurrence of the search characters and displays the Find dialog box if you selected Find in step 3, or the Replace dialog box if you selected "Replace with."

7. In the Find dialog box, choose Find Next to highlight the next occurrence of the search characters, or Close to stop the search and return to Ready mode.

8. In the Replace dialog box, choose one of the following:
   - Replace replaces the highlighted characters with the replacement characters and highlights the next occurrence of the search characters.
   - Replace All replaces all remaining occurrences of the search characters with the replacement characters, without highlighting any more occurrences of the search characters.
   - Find Next moves to the next occurrence of the search characters and doesn't replace the highlighted occurrence.
   - Close stops the search and returns to Ready mode.

1-2-3 displays a message when it can't find another occurrence of the search characters.

**Note** If you are using versions, Search and Replace works on the current version only. For more information, see Chapter 17.

## To check spelling

You can correct misspelled words and check for duplicate words, such as "the the" in worksheet entries, charts, text blocks, and query tables.

1. To limit the area where 1-2-3 checks, select a range.

2. Choose Tools Spell Check.

3. Under Check, select an option.
   - Entire file checks all cells, charts, and text blocks in the current file. Select this option to check spelling in charts.
   - Current worksheet checks all cells and text blocks in the current worksheet.
   - Range checks cells, query tables, and text blocks within the selected range.
4. Choose OK.

   1-2-3 begins checking the worksheet for spelling errors and duplicate words. If it finds a word that's not in the language dictionary or a duplicate word, 1-2-3 highlights the word in the worksheet and displays the following dialog box:

5. Do one of the following:
   - To change the word, select an alternative word from the Alternatives list box, or enter an alternative in the "Replace with" text box. Then choose Replace to replace only this occurrence of the unrecognized word or Replace All to replace all occurrences of the unrecognized word.
   - To keep a word unchanged, choose Skip or Skip All.
   - To add the word to the user dictionary, choose Add To Dictionary.
   - To delete a repeated word, press **DEL** and then choose Replace.
   - To stop checking spelling and save any corrections you've made up to that point, choose Close.

When 1-2-3 finishes checking spelling, it displays a message.

**Help** You can add words to the user dictionary, use a different default language dictionary, and select various spell check options. For more information, search on "Spelling" in Help.

## Copying data

After you've entered data once, you can copy it to other places in the worksheet. Copying data saves time and prevents typing errors. Copying always leaves what you copied unchanged. You can copy ranges, columns, rows, and drawn objects such as charts. For information about copying drawn objects, see page 178. Also, when you copy data, it can affect your formulas. For more information, see "Copying and moving formulas" on page 108.

You can copy data by dragging a copy to another location, by using the Clipboard, or by filling adjacent cells. Dragging is a quick and easy way to copy data within a worksheet, between worksheets and files, and to other applications.

The **Clipboard** is a temporary storage area for data that you remove or copy using Edit Cut or Edit Copy. You can use Edit Paste to copy data from the Clipboard to as many locations as you want, including worksheets in other active files. The copied or cut data remains on the Clipboard until you replace it by using Edit Cut or Edit Copy again.

**Help** For information about copying data from the current file and extracting it to a file on disk, search on "Extracting data" in Help.

## To copy data by dragging

This section describes how to copy data by dragging within a single worksheet.

**Help** To find out how to copy data by dragging between 1-2-3 worksheets and files, or to other applications, search on "Drag-and-drop" in Help.

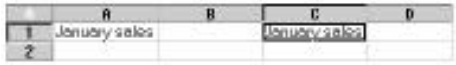
1. Select the range.
2. Move the mouse pointer to the edge of the selected range so that the pointer changes to a hand, as shown below.

*You can cancel dragging by pressing* **ESC** *before you release the mouse button.*

3. Hold down **CTRL**, press the mouse button, and drag a copy of the selected range.

   While you drag, the mouse pointer changes to a fist with a + (plus sign), and the range appears as an outline.

4. Release the mouse button first and then the **CTRL** key when the outline of the range is where you want to put the copy.




If the destination range contains existing data, you will receive a message asking if you want to replace the data or cancel the copy.

## To copy data using the Clipboard

1. Select the range.
2. Choose Edit Copy or press **CTRL+C**.

   1-2-3 places a copy of the data on the Clipboard.
3. Select the destination for the copied data.

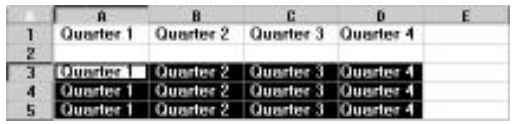
   You need to select only the top left cell of the destination range. The destination range can be in the same file, in another file, or in another active Windows application.

   **Caution** 1-2-3 writes over any existing data in the destination range.

4. Press **ENTER** or choose Edit Paste.

The contents of the Clipboard appear in the destination range. To paste the data into other ranges, repeat steps 3 and 4.

If the destination range has room for more than one copy of the source range, 1-2-3 repeats the copied data until the destination range is full. For example, if you copy the quarterly headings to a range containing three rows, they appear three times, as shown below.



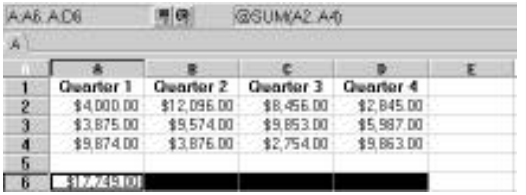

## To copy data to adjacent cells

You can copy the contents of the top row or leftmost column of the range to the remaining cells in the range. This is especially useful for copying formulas and @functions.

1. Select a range.

   Include the cells you want to copy and the adjacent area down or to the right that you want to fill with the copied data. For

example, you can select the range A6..D6 to copy the formula in cell A6 to cells B6, C6, and D6.



| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | |
| 2 | $4,000.00 | $12,096.00 | $8,456.00 | $2,845.00 | |
| 3 | $3,875.00 | $9,574.00 | $9,853.00 | $5,987.00 | |
| 4 | $9,874.00 | $3,876.00 | $2,754.00 | $9,863.00 | |
| 5 | | | | | |
| 6 | $17,749.00 | | | | |

2. Do one of the following:

- To copy the leftmost column of the selection into the selected adjacent columns to the right, choose Edit Copy Right.

- To copy the top row of the selection into the selected adjacent rows below, choose Edit Copy Down.

For example, to copy the formula in cell A6 to cells B6, C6, and D6, choose Edit Copy Right.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | |
| 2 | $4,000.00 | $12,096.00 | $8,456.00 | $2,845.00 | |
| 3 | $3,875.00 | $9,574.00 | $9,853.00 | $5,987.00 | |
| 4 | $9,874.00 | $3,876.00 | $2,754.00 | $9,863.00 | |
| 5 | | | | | |
| 6 | $17,749.00 | $25,546.00 | $21,063.00 | $18,695.00 | |

**Help** You can also copy data to adjacent cells up or to the left, or to adjacent worksheets. For more information, search on "Copying data" in Help.

## Moving data

You can rearrange your worksheet data by moving it. When you move data, 1-2-3 leaves the source range blank and enters the data, including styles, in the destination. You can move data either by dragging it or by cutting and pasting it using the Clipboard. For information about the Clipboard, see page 86.

Because you make only one selection and don't use the Clipboard, dragging is the quickest way to move data within a worksheet, between worksheets and files, and to other applications. You can drag ranges, columns, rows, charts, and drawn objects. You can also drag chart elements including titles, footnotes, legends, and pie slices. For more information about moving drawn objects, see page 179.

When you drag a range of data, you will get a message if there is any data in the destination range. You can then choose to replace the

existing data or cancel the move. When you drag entire columns or rows, 1-2-3 inserts them instead of writing over data in the destination range. When you move data, it can affect your formulas. For more information, see “Copying and moving formulas” on page 108.

When you use the Clipboard, you can paste data to as many locations as you want. The cut data remains on the Clipboard until you replace it by using Edit Copy or Edit Cut again.

## To move data by dragging

This section describes how to move data by dragging within a single worksheet.

**Help** To find out how to drag data between 1-2-3 worksheets and files, or to other applications, search on “Drag-and-drop” in Help.

1. Select the range.
2. Move the mouse pointer to the edge of the selected range so that the pointer changes to a hand, as shown below.

3. Hold down the mouse button and drag the selected range.

   While you drag, the mouse pointer changes to a fist and the range appears as an outline.

*You can cancel dragging by pressing* **ESC** *before you release the mouse button.*

4. Release the mouse button when the outline of the range is where you want to move the data.

   If the destination range contains existing data, you will receive a message asking if you want to replace the data or cancel the move.

## To move data using the Clipboard

1. Select the range.
2. Choose Edit Cut or press **CTRL+X**.

1-2-3 places the data on the Clipboard and removes it from the worksheet.

3. Select the destination range.

   You need to select only the top left cell of the destination range.

   **Caution** 1-2-3 writes over existing data in the destination range.

4. Choose Edit Paste or press **CTRL+V**.

The contents of the Clipboard appear in the destination range. To paste the data into other ranges, repeat steps 3 and 4.

## Inserting and deleting columns, rows, and ranges

You can insert and delete entire columns and rows. You can also insert or delete a selected range in a worksheet. When you insert a selected range, an adjacent range of the same proportions shifts to the right or down to make room for the inserted range. When you delete a selected range, an adjacent range of the same proportions shifts left or upwards to take the place of the deleted range.

**Caution** If Group mode is on, adding or deleting columns or rows affects the same range in all worksheets in the file. For more information about Group mode, see "Grouping worksheets" on page 65.

You can also insert and delete entire worksheets. For more information, see page 59.

### To insert columns or rows

1. Select as many entire columns or rows as you want to insert.

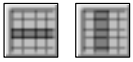
| | A | B | C | D |
|---|---|---|---|---|
| 1 | | January | February | March |
| 2 | Boston | 943 | 782 | 490 |
| 3 | Chicago | 570 | 874 | 567 |
| 4 | New York | 350 | 654 | 932 |

2. Choose Edit Insert or press **CTRL+GRAY PLUS** on the numeric keypad.

   1-2-3 inserts the number of columns or rows you selected, placing new columns to the left of the columns you selected or new rows above the rows you selected.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | | January | February | March |
| 2 | Boston | | | 943 | 782 | 490 |
| 3 | Chicago | | | 570 | 874 | 567 |
| 4 | New York | | | 350 | 654 | 932 |

## To delete columns or rows

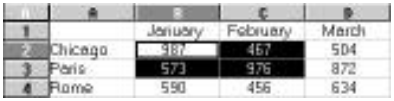


1. Select the columns or rows you want to delete.
2. Choose Edit Delete or press **CTRL+GRAY MINUS** on the numeric keypad.

   1-2-3 deletes the selected columns or rows, along with any data they contain. The columns to the right or the rows below take the place of what you deleted.

## To insert a range

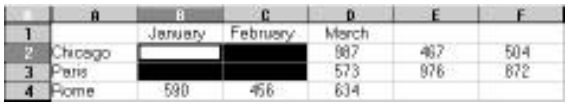
1. Select a range where you want to insert a range of the same proportions.



| | A | B | C | D |
|---|---|---|---|---|
| 1 | | January | February | March |
| 2 | Chicago | 987 | 467 | 504 |
| 3 | Paris | 573 | 976 | 872 |
| 4 | Rome | 590 | 456 | 634 |

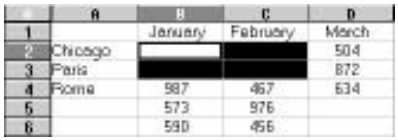
2. Choose Edit Insert or press **CTRL+GRAY PLUS**.

3. Select the Insert selection check box.
4. Do one of the following:
   - To shift the selected range to the right, select Column.



| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | January | February | March | | |
| 2 | Chicago | | | 987 | 467 | 504 |
| 3 | Paris | | | 573 | 976 | 872 |
| 4 | Rome | 590 | 456 | 634 | | |

   - To shift the selected range down, select Row.



| | A | B | C | D |
|---|---|---|---|---|
| 1 | | January | February | March |
| 2 | Chicago | | | 504 |
| 3 | Paris | | | 872 |
| 4 | Rome | 987 | 467 | 634 |
| 5 | | 573 | 976 | |
| 6 | | 590 | 456 | |

5. Choose OK.

## To delete a range

1. Select the range you want to delete.
2. Choose Edit Delete or press **CTRL+GRAY MINUS**.
3. Select the Delete selection check box.
4. Do one of the following:
   - If you want the range to the right of the deleted range to shift left, select Column.
   - If you want the range below the deleted range to shift upwards, select Row.
5. Choose OK.

## How inserting and deleting affects formulas

Inserting or deleting columns, rows, and worksheets may move formulas or the values they refer to. 1-2-3 adjusts each formula so that it continues to refer to the same values as before. When you insert rows, columns, or worksheets in the middle of a range that a formula refers to, 1-2-3 adjusts the formula to include the new cells in the range.

If you insert rows or columns just *under* or *next to* a range a formula refers to, *you* must adjust the formula if you want it to include the inserted cells.

If you delete a column, row, or worksheet containing a range that a formula refers to, the formula results in ERR. Any other formulas that depend on this invalid formula also result in ERR. For more information, see "Moving formulas" on page 111.

## Related Help topics

You can rearrange data by **transposing** it, which means converting rows into columns and columns into rows. For more information, search on "Transposing data" in Help.

You can use Edit Paste Special to paste the styles and contents of a range separately. For more information, search on "Pasting data" in Help.

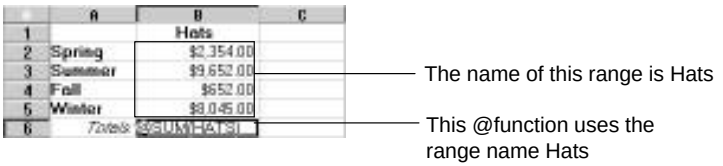
Also, Tutorial lessons 1 and 2 include exercises for entering and editing data. Choose Help Tutorial to start the Tutorial.

# 9 Working with Range Names

You can name a range and then use the name in place of the address. Range names are easy to remember and enter, and they're convenient for building formulas, going to and selecting data, and printing specific areas of a file. You also name ranges to use with Version Manager. This chapter describes how to name a range, go to and select a named range, enter a range name in a dialog box, and delete range names.

## What is a range name?

A **range name** is a word you substitute for an address. You can use range names instead of addresses in formulas, @functions, macros, and dialog boxes. In the illustration below, the name of range B2..B5 is Hats, and the range name appears in an @function.




## Naming ranges

You can name a range by typing the name. You can also name several single-cell ranges at once, using labels in adjacent cells. After you name a range, 1-2-3 substitutes the name for the address in any existing formulas containing the address.

For example, if you name B2..B5 HATS, 1-2-3 changes the formula @SUM(B2..B5) to @SUM(HATS). For more information about using range names in formulas and @functions, see page 105.

The number of range names you can create in a file is limited only by the amount of available memory. You can have different names for the same range, but you can't use the same name for more than one range in the same file. If you give a range another name, it doesn't replace the old name in formulas. You can also delete existing names.

When you insert or delete columns or rows within a named range, 1-2-3 changes the range associated with the name. For example, if the name of A6..C6 is Terms, and you insert a column between columns B and C, Terms becomes A6..D6.

If you move data into the first or last cell of a named range, the range name is no longer associated with that range. Also, if you delete a column, row, or worksheet that contains the first or last cell of a range, the range name is no longer associated with that range. Formulas that contain range names not associated with a range result in ERR.

**Help** For more information about ERR, search on "ERR" in Help.

## Range name guidelines

Use the following guidelines when naming ranges:

- Range names can be up to 15 characters long.
- You can enter names in uppercase characters, lowercase characters, or a combination. When you enter the name, 1-2-3 changes it to uppercase.
- You can use letters, numbers, and _ (underscores) in range names, but don't start a range name with a number.
- Don't start a range name with ! (exclamation point) and don't include , (comma), ; (semicolon), . (period), or the characters +, –, *, /, &, >, <, @, #, or { in a range name.
- Don't use spaces in range names. Use _ (underscores) instead.
- If you're not using the range name in formulas or macros, you can use – (hyphen) in the name, but don't begin a name with a hyphen.
- Don't use @function names, macro command keywords such as BEEP, or the names of keys, such as **HOME**.
- Don't create names that look like cell addresses, such as Q2 for Quarter 2, or FY93 for Fiscal Year 1993.

## To name a range by typing

1. Select the range.
2. Choose Range Name.

3. Type the name in the Name text box.
4. Choose Add.

   1-2-3 adds the name to the list of existing named ranges.
5. Choose OK.

## To name a range using adjacent labels

You can name single-cell ranges using labels you've entered in adjacent cells. This method is convenient for naming more than one single-cell range at a time. The labels can be to the right, to the left, above, or below the cells you want to name. In the illustration below, the labels name the cells to the right.

Use the labels in A1, A2, and A3...

| | A | B | C |
|---|---|---|---|
| 1 | Principal | $120,000.00 | |
| 2 | Interest | 12.00% | |
| 3 | Term | 30 | |

...to name the adjacent cells to the right: B1, B2, and B3

1. Select the range containing the labels.
2. Choose Range Name.
3. In the For cells drop-down box, select a direction: To the right, To the left, Above, or Below.
4. Choose Use Labels.
5. Choose OK.

Each label in the range becomes the name of the adjacent cell in the specified direction.

## Using range names

This section describes how to go to and select a named range, enter a range name in a dialog box, and delete range names.

### To go to and select a named range

1. Do one of the following:
   - To go to and select a named range in the current file, click the navigator and select a name from the list.

Select from the list of named ranges in the current file

   - To go to and select a named range in the current file or in another active file, choose Edit Go To or press **F5 (GOTO)**; select a range name; and choose OK.

Select from the list of range names

To see range names in another active file, select the file from this drop-down list

1-2-3 moves the cell pointer to the first cell of the range and selects the entire range. If the range is outside the visible area of the worksheet, 1-2-3 scrolls the worksheet so the top left cell of the range appears in the top left corner of the active window.

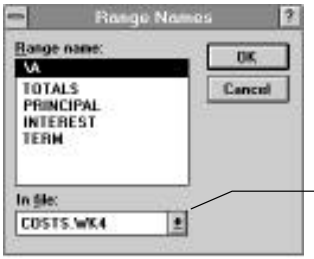
### To enter a range name in a dialog box

After choosing a command, you can enter a range name instead of a range address in the dialog box. You can type the name, use the navigator, or press **F3 (NAME)**.

1. In the dialog box, select the range text box where you want to enter the range name.

2. Do one of the following:
   - Type the range name.

     If the range is in another active file, include the file name enclosed in << >> (angle brackets); for example, <<COSTS.WK4>>TOTALS.
   - Click the navigator and select the name of a range in the current file.
   - Press **F3 (NAME)**, select a range name, and choose OK.




To see range names in another active file, select the file from this drop-down list

## To delete range names

You can delete range names in the current file one at a time or all at once.

1. Choose Range Name.
2. Do one of the following:
   - To delete a range name in the current file, select the name from the Existing named ranges list box and choose Delete.
   - To delete all the range names in the current file, choose Delete All.
3. Choose OK.

When you delete a range name, the data in the range doesn't change. If you delete a range name used in a formula, 1-2-3 replaces the range name with its associated address. For example, if SALES is the name of B14..H14, and you delete the name SALES, 1-2-3 changes @SUM(SALES) to @SUM(B14..H14).

**Note** A named range can also have one or more versions. If you delete a named range, 1-2-3 deletes all versions of the range. For more information about versions, see Chapter 17.

# 10 Calculating with Formulas

Formulas are the basis of all calculations in 1-2-3. When you calculate with a formula, your data is dynamic. If you change a value a formula refers to, 1-2-3 automatically recalculates the formula. This chapter describes the types of formulas you can use, the rules for entering formulas, and how to enter, copy, and move formulas.

## What is a formula?

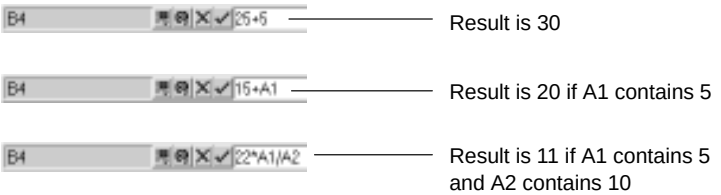
A **formula** is a worksheet entry that calculates data. The result of a formula is a number or text. A formula can contain numbers, text, operators, cell addresses, range names, @functions, and other formulas.

The formula calculation can be a simple mathematical calculation, such as subtracting one number from another, or a more complicated calculation, such as determining the net present value of a series of future cash flows.

## Types of formulas

You can enter three types of formulas in 1-2-3: numeric, text, and logical.

**Numeric formulas** perform calculations with values. Most of the formulas in a typical worksheet are numeric formulas. Numeric formulas use +, –, *, /, and ^ for addition, subtraction, multiplication, division, and exponentiation. The illustration below shows some examples of simple numeric formulas.

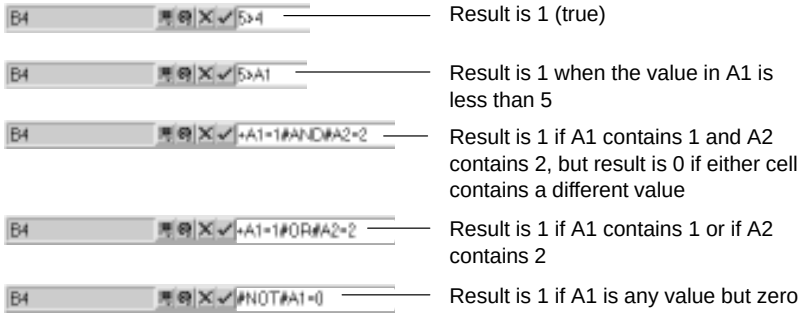


1-2-3 can calculate any numeric formula whose value is from 9.99E–4931 ($9.99*10^{-4931}$) through 1.1895E+4932 ($1.1895*10^{4932}$). However, the value of the formula must be from 1E–99 ($1*10^{-99}$) through 9.99E+99 ($9.99*10^{99}$) for 1-2-3 to display it; otherwise, 1-2-3 displays *** (asterisks) in the cell containing the formula.

The number of decimal places 1-2-3 displays for a calculated value depends on the number format of the cell. 1-2-3 calculates the value to a precision of between 18 and 19 total digits regardless of how many it displays. You can use an @function, such as @ROUND, to specify a different precision.

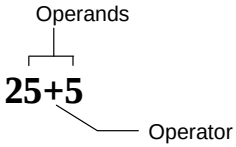
You use **text formulas** to manipulate text. In a text formula, you must enclose text in " " (quotation marks). Text formulas use & (ampersand) to combine strings of text. You can use text formulas to combine in one cell the text from several cells, to change the case of text characters, or to find occurrences of certain text characters in cells. The illustration below shows two examples of text formulas.

**Logical formulas** are statements that evaluate a condition. They result in 1 if true and 0 if false. You can use them to test whether a value meets a condition before using it in other formulas. Logical formulas use =, <, >, <=, >=, and <>, as well as #AND#, #OR#, and #NOT# to evaluate various conditions. The figure below shows some examples of logical formulas.

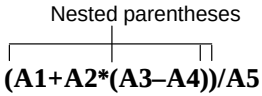


## Building a formula

To build a formula, you use the following three basic elements:




- **Operands** are values or text that the formula operates upon. Although you can enter values or text directly into a formula, you can often make a formula more useful by entering instead the addresses or names of cells that contain the values or text. For information, see "Referring to cells and ranges in formulas" on page 104.
- **Operators** are mathematical symbols, text characters, or logical statements that tell 1-2-3 what to do with the operands in a formula. The **arithmetic operators** are +, –, *, /, ^ for addition, subtraction, multiplication, division, and exponentiation. The **text operator** for combining text is & (ampersand). The **logical operators** are =, <, >, <>, >=, <=, #NOT#, #AND#, and #OR#.
- **Separators** are for combining various operations and multiple formulas in one formula. You can use parentheses in complex formulas to tell 1-2-3 the order in which you want the formulas calculated.




In the example at left, the inside formula is set off from the outside formula with parentheses. In a formula, one or more pairs of parentheses enclosed in another pair of parentheses are called **nested parentheses**.

**Help** Lesson 1 in the Tutorial includes an exercise for building formulas. Choose Help Tutorial to start the Tutorial.

## Entering a formula

This section describes the guidelines and procedure for entering a formula, and some common errors.

### Guidelines for entering formulas

Use the following guidelines when entering a formula:

- A formula can begin with a number or one of the characters +, –, =, (, @, ., $, #. An @ (at sign) indicates an @function; . (period) indicates a decimal; $ (dollar sign) indicates an absolute reference; # (number sign) indicates the beginning of a logical formula.
- When the first element of a formula is a cell address or range name, you must begin the formula with +, –, =, (, or $. For example, +B7/B8, -B7*B8, (JAN-20), and $JAN/B8 are all valid formulas.

- When the first character in a text formula is a " (quotation mark), you must begin the formula with ( or +. For example, ("Ms. "&LAST), and +"Ms. "&LAST are both valid formulas.
- When a formula looks like a date in month / day / year, day / month / year, or year-month-day format, begin the formula with +; otherwise, 1-2-3 enters a date or date number instead of the formula. For example, +9 / 25 / 90 is a valid formula.
- A formula can't contain spaces except within text enclosed in " " (quotation marks) in text formulas and text @functions.
- To enter an @function in a formula, you can select it from the @function selector in the edit line; or you can type @, press **F3 (NAME)**, and then select the @function. See Chapter 11 for more information about @functions.
- 1-2-3 assigns the value 0 to blank cells whose addresses are used in formulas and @functions, except statistical and text @functions. Most statistical @functions ignore blank cells, and text @functions evaluate to ERR.

## To enter a formula

You enter a formula in a cell much as you enter any data in a worksheet. Once you've entered a formula in a cell, 1-2-3 displays the formula in the contents box and the formula's result in the cell. Unless you format the cell as text or edit in the cell, the formula itself appears only in the contents box.

1. Select the cell where you want to enter the formula.
2. Enter + to begin the formula.

   You can also begin the formula with a number or the characters –, =, @, ., (, #, $. The mode indicator changes to Value.

*Beginning a formula with = is the same as beginning it with +.*

3. Enter the first operand (cell A1 in the example).
4. Enter the first operator (+ in the example).
5. Enter the next operand (cell B1 in the example).
6. Repeat steps 4 and 5 until the formula is complete.

   The example uses only two operands and one operator, but a formula can contain several operands, operators, and parentheses as needed, using up to 512 characters. Enter spaces only within text enclosed in quotation marks.

*To add a note to the formula, type ; (semicolon) immediately after the formula and then type the note. The note appears in the contents box only, unless you format the cell as text.*

7. When the formula is complete, click the Confirm button or press **ENTER**.

If the result of the formula is too long to fit in the cell, 1-2-3 displays *** (asterisks). To display the formula result, widen the column by double-clicking the column border to the right of the column letter. For more information, see "Changing column width" on page 132.

**Caution** Because you can select ranges for a formula with the mouse or by using ↑, ↓, →, ←, confirming a formula entry by clicking another cell or by using ↑, ↓, →, ← may not produce the results you intend. For more information about selecting ranges for a formula, see "Referring to cells and ranges in formulas" on page 104.

## Some common errors in formulas

When you try to enter a formula containing an error, 1-2-3 beeps and doesn't accept the formula, or the formula results in ERR. If 1-2-3 beeps, the insertion point remains in the formula so you can examine the formula for errors such as extra spaces, missing operators, or missing parentheses. You can edit a formula as you edit any data.

The table below suggests solutions for common errors that can occur when you enter a formula.

| *What you did* | *Try this* |
|---|---|
| **Why does this formula result in ERR?** | |
| You used zero as a denominator. | Don't divide by zero. |
| You used an undefined range name or text that you haven't yet defined as a range name. | Link the name with an address. For information, see "Naming ranges" on page 93. |
| In a text formula, you referred to a cell that contains a value. | Correct the formula to refer to a cell that contains text, or correct the cell so it contains text. |
| You referred to a file that doesn't exist. | Create the file or refer to an existing file using a file reference. For more information on file references, see "Referring to other files in formulas" on page 106. |
| You deleted a range name referred to in the formula, or moved data into its first or last cell. | Correct the address to refer to the data in its new location. |

*Continued*

| *What you did* | *Try this* |
|---|---|
| **Other problems** | |
| Your numeric formula looks like a date to 1-2-3, for example 11/30, or 30-Aug (if Aug is a range name). | Enclose the formula in parentheses or start with + or =, for example +30-Aug or (11/30). |
| You entered a formula that begins with a range name, and it didn't evaluate. | Enclose the formula in parentheses or start it with +, –, or =. |
| You entered an address one way, for example with a worksheet letter in the address, but 1-2-3 changed the way the address looks, or changed the address to a range name. | Don't worry. 1-2-3 sometimes adjusts references you enter to show what's relevant. For example, if you have only one worksheet, 1-2-3 doesn't show worksheet letters in the formula. This doesn't affect your formulas. |

## Referring to cells and ranges in formulas

You don't have to enter the values and text that a formula calculates directly into the formula. Instead, you can use addresses or names of single cells that contain the data you want to use in your calculations. With @functions, you can use multiple-cell as well as single-cell addresses.

A cell address in a formula is called a **reference** because the formula refers to data in this cell. Every time you change the data in a cell referred to by a formula, the result of the formula changes, as shown below.

The formula in B3 subtracts the contents of B2 from B1

When the value in B1 changes, the result of the formula in B3 also changes

## To enter an address in a formula

You can enter a cell or range address in a formula by typing it, or you can select the range with the mouse or keyboard so that 1-2-3 enters the address for you. Selecting helps you avoid typing errors.

1. Select a cell and begin entering the formula by typing an operator.

2. Select the cell or range you want to refer to:

   **Mouse** Click the cell or drag to select a range.

   **Keyboard** Use ↑, ↓, →, ← to move the cell pointer to the cell. For a range, move to a cell at the corner of the range, press . (period), and use ↑, ↓, →, ← to highlight the other cells. You can also type the address into the formula.

3. You can enter other operators and addresses, and separators as needed, up to 512 characters.

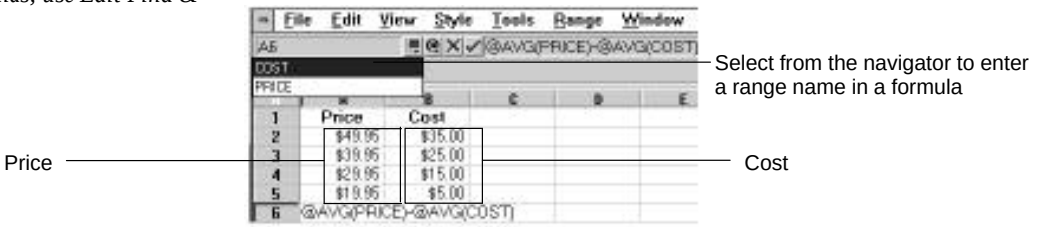
4. Click the Confirm button, or press **ENTER**.

1-2-3 enters the result of the formula in the cell.

## To enter a range name in a formula

*To locate and change occurrences of a range name in formulas, use Edit Find & Replace.*

You can enter a range name in a formula in place of an address. Suppose you have two ranges named PRICE and COST in a worksheet. The formula below uses range names to subtract the average of the COST range from the average of the PRICE range. You can enter the range names in the formula by selecting them from the navigator.




*If you plan to use a range name in a formula, you can use it as a placeholder in the formula before you define the range name. The formula results in ERR until you define the range name.*

1. Begin entering a formula.

   Enter the formula up to the operator or ( (open parenthesis) that precedes the range name you want to enter.

2. Do one of the following:
   - Click the navigator and select the range name from the list.
   - Press **F3 (NAME)** and select the range name from the list.
   - Type the range name.

3. Complete the formula.

## Referring to other files in formulas

Formulas can refer to ranges in other 1-2-3 files as well as ranges in the current file. This is called a **file reference**. A formula in one file that refers to a range in another file **links** the two files. A formula can refer to an active file or to a file on disk.

*Sharing data in formulas is easier and faster within the same file. If you don't need to keep linked data in separate files, put it all in a multiple-sheet file.*

For example, if you're doing a complex set of tax calculations depending on rates that might change with new tax legislation, you can create a separate file containing a list of the various tax rates. Then you can create links to these rates in files that do the tax calculations. When you change the tax rates, 1-2-3 automatically updates all the formulas that refer to these rates.

### To refer to another file in a formula

1. Enter the formula up to the operator or ( (open parenthesis) that precedes the file reference.
2. Do one of the following:
   - If the other file is visible, use the mouse to select the range.
   - If the other file is open, press **F3**, then choose the file from the In file drop-down box.
   - Press **CTRL+PG UP** or **CTRL+PG DN** to go to the other file and use the keyboard to select the range.
   - Type the file reference using the following format:

     +<<*filename*.WK?>>*range*

     where *filename*.WK? is the name and extension of the file and *range* is the address or range name of the data you want to reference; for example, <<SALES.WK4>>A:E2 in the illustration below.

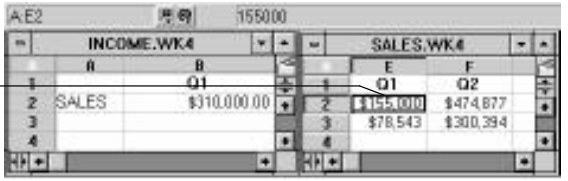
**Note** You can specify the *filename* with or without a path, and you can link to .WK4, .WK3, or .WK1 files.

Formula in B2 of INCOME refers to data in cell E2 of SALES

3. Click the Confirm button or press **ENTER**.

Any changes you make to data in the SALES file are automatically reflected in the formula in B2 of the INCOME file. For example, if the value in A:E2 in the SALES file changes, then the value of the formula in A:B2 in the INCOME file changes as shown in the illustration below.

Changing the value in E2 of SALES changes the value of the formula in B2 of INCOME




## To update file links

If Tools User Setup Recalculation is set to Automatic, when you open a file that refers to other active files, 1-2-3 automatically updates all the file links. If you open a file that has links to a file on disk and the Auto refresh file links option is not selected in the Tools User Setup dialog box, you need to update the links manually so the file uses current data from the linked files. When you update file links, 1-2-3 updates all the links in the file; you can't update links individually. For more information about recalculating formulas, see page 112.

1. Choose Edit Links.
2. Select File links from the Link type drop-down box.
3. Choose Update All.
4. Choose Close.

## How 1-2-3 calculates a formula

**Precedence numbers** represent the order in which 1-2-3 performs operations in a formula. The lower the precedence number, the earlier 1-2-3 performs the operation. 1-2-3 performs operations with the same precedence number sequentially from left to right. The following table shows the order of precedence for all operators you can use in formulas.

| *Precedence number* | *Operation* | *Operator* |
|---|---|---|
| 1 | Exponentiation | ^ |
| 2 | Identification of value as negative or positive | – + |
| 3 | Multiplication and division | * / |

*Continued*

| | | |
|---|---|---|
| 4 | Addition and subtraction | + – |
| 5 | Equal-to and not-equal-to tests | = <> |
| 5 | Less-than and greater-than tests | < > |
| 5 | Less-than-or-equal-to test | <= |
| 5 | Greater-than-or-equal-to test | >= |
| 6 | Logical-NOT test | #NOT# |
| 7 | Logical-AND and logical-OR tests | #AND# #OR# |
| 7 | Text concatenation | & |

## Overriding order of precedence

You can override precedence order in a formula by enclosing operations in parentheses. 1-2-3 performs operations enclosed in parentheses first. Within each set of parentheses, the precedence numbers listed in the table on the previous page apply.

The illustration below shows the order in which 1-2-3 performs the operations in a formula containing nested parentheses and operators with different precedence numbers.

4th 1st 2nd 3rd 5th

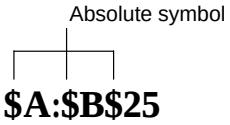
**A1+((A2+A3)*A4)/A5–A6**

## Copying and moving formulas

You can copy a formula and use it in other cells, or move it to a new location in the worksheet. You can copy or move formulas to different cells of the same worksheet, to different worksheets, or to different files. You copy a formula the same way you copy other data. For information, see "Copying data" on page 86. This section describes how copying and moving formulas affects cell references.

When you copy a formula containing addresses, the addresses automatically adjust to their new location(s) in the worksheet. Addresses that adjust when you copy them to new locations are called **relative references**.

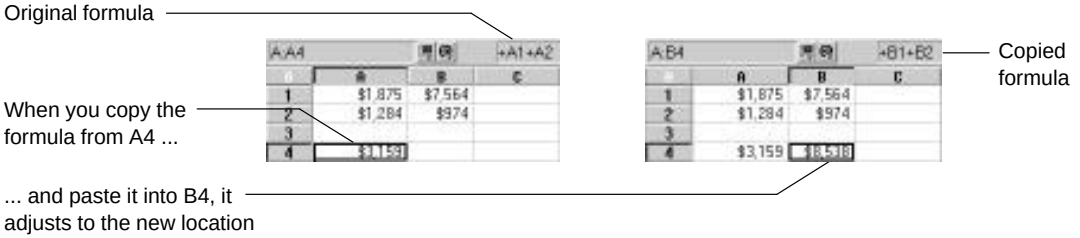
Sometimes you want to copy formulas to other locations but want to make sure they always refer to the same worksheets, rows, and columns. Addresses that always refer to the same worksheets, rows, and columns no matter where you put them are called **absolute references**.




You can make relative references absolute by adding a $ (dollar sign) to the worksheet letter or name, to the column letter, and to the row number, as shown in the figure to the left. You can create a **mixed reference** by making part of an address absolute and leaving other parts relative, for example $A:B$25.

## Copying formulas with relative references

An ordinary cell address, for example, A:B25, is all relative. When you copy a formula containing relative references and paste it in a new location, 1-2-3 automatically adjusts the cell and range addresses in the formula to refer to cells relative to the formula's new location, as shown in the next illustration.




If you want to use the same formula in many cells, you can copy the original formula and paste it into several cells at once. For example, you can copy a formula in column A and then paste it into columns B through D. 1-2-3 adjusts the addresses for each new location.

## Copying formulas with absolute references

Sometimes you want a formula always to refer to the same cells, no matter where and how many times you copy and paste it. To ensure that a formula refers to the same cells even if you copy it, you can change the references to absolute references.

To make references absolute, add a $ (dollar sign) before each element in the reference, or select the reference and press **F4 (ABS)**. File names are always absolute references.

Suppose you're calculating the interest on a series of principal values, and you want to use the same interest rate each time. The following illustration shows how you can make an absolute reference to the cell containing the interest rate. The formula in B4 contains an absolute reference to the interest rate in A2. When you copy this formula and paste it into cells in column B, the copied formulas also refer to A2.

A2 contains the interest rate you always want to use

| B4 | | +A4*$A$2 | |
|---|---|---|---|
| | A | B | C |
| 1 | Always use this rate: | | |
| 2 | 7.25% | | |
| 3 | Principal | Interest | |
| 4 | $1,000 | +A4*$A$2 | |
| 5 | $2,000 | +A5*$A$2 | |
| 6 | $3,000 | +A6*$A$2 | |
| 7 | $4,000 | +A7*$A$2 | |
| 8 | $5,000 | +A8*$A$2 | |

This range contains copies of a formula that makes an absolute reference to A2...

| B4 | | +A4*$A$2 | |
|---|---|---|---|
| | A | B | C |
| 1 | Always use this rate: | | |
| 2 | 7.25% | | |
| 3 | Principal | Interest | |
| 4 | $1,000 | $72.50 | |
| 5 | $2,000 | $145.00 | |
| 6 | $3,000 | $217.50 | |
| 7 | $4,000 | $290.00 | |
| 8 | $5,000 | $362.50 | |

... so the formula multiplies all the principal amounts in column A by the same interest rate in A2

## Copying formulas with mixed references

When you copy or move a formula that refers to a range, you may want part of the address to stay the same in the new formula and part of the address to change. For example, you may want the column letter to stay the same but the row number to change. You do this by using a mixed reference.

A mixed reference contains some absolute and some relative elements, for example an absolute column letter and a relative row number. To make parts of a reference absolute, add a $ (dollar sign) before the part you want to be absolute, or press **F4 (ABS)** repeatedly until it's correct.

Suppose you want to calculate interest, as in the previous example, but using three different interest rates. You can use the same formula to do all the calculations, as long as it contains mixed references.

The formula in the illustration which follows, +$A4*B$1, mixes absolute and relative references. It makes a relative reference to the column and an absolute reference to the row containing the interest rates. So 1-2-3 moves across a column each time, but looks in the same row. It also makes a relative reference to the row and an absolute reference to the column containing the various principal values. So 1-2-3 moves down a row each time but looks in the same column.

The formula refers to the interest rate by relative column, absolute row

The formula refers to the principals by absolute column, relative row

B4 =$A4*B$1

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Try these interest rates: | 7.50% | 8.00% | 8.50% | |
| 2 | | | | | |
| 3 | Principal | | | | |
| 4 | $1,000 | $75 | $80 | $85 | |
| 5 | $2,000 | $150 | $160 | $170 | |
| 6 | $3,000 | $225 | $240 | $255 | |
| 7 | $4,000 | $300 | $320 | $340 | |
| 8 | $5,000 | $375 | $400 | $425 | |

## To copy and paste the results of a formula

Occasionally you want to copy a formula and paste the results of the formula, not the formula itself, into another cell. This is useful when you need only the results for further calculations.

1. Select the cell or range that contains the formula or formulas whose results you want to copy.
2. Choose Edit Copy.
3. Select the cell or range where you want to paste the results of the formula or formulas.
4. Choose Edit Paste Special.
5. Under Paste, select Formulas as values.
6. Choose OK.

*To convert a formula to its value, double-click the cell containing the formula and press* **F9 (CALC)**.

**Shortcut** Do the first 3 steps of the procedure above, and then click the icon at left to paste formulas as values.

## Moving formulas

Moving data affects formulas in different ways depending on whether you move the formulas, the cells they refer to, or both. You move formulas and data for formulas the same way you move other data. For information about moving data, see page 88.

Keep in mind the following when moving formulas and data for formulas:

- If you move a formula, but not the data it refers to, the references in the formula don't change. For example, if you move the formula +A1+B3 from cell C10 to cell D10, the formula remains +A1+B3.
- If you move the data that a formula refers to, 1-2-3 adjusts the formula. For example, if cell C10 contains +A1+B3 and you move the contents of cell A1 to cell Q25, the formula in cell C10 changes to +Q25+B3.

- If you move a formula and the data it refers to, 1-2-3 adjusts all references, including absolute references. For example, if cell A3 contains the formula +$A$1+A2 and you move the range A1..A3 to B1..B3, the formula in cell B3 is +$B$1+B2.

## Recalculating formulas

The Tools User Setup Recalculation setting determines how 1-2-3 recalculates your formulas when you change data they refer to.

- When Tools User Setup Recalculation is set to Automatic (the default), 1-2-3 immediately recalculates formulas whenever you change data they refer to. Automatic recalculation occurs in the background, so you can continue your work while it's happening.

  The Calc button appears in the status bar whenever 1-2-3 is performing an automatic recalculation.

- When Tools User Setup Recalculation is set to Manual, 1-2-3 recalculates formulas only when you press **F9 (CALC)**, or click the Calc button in the status bar, or click the icon at left. Manual recalculation occurs in the foreground, so you must wait for 1-2-3 to complete it before continuing your work.

  With manual recalculation, the Calc button appears in the status bar whenever you change worksheet data. This reminds you that some of your formulas may now need updating.

  **Note** These recalculation methods apply only to formulas that refer to data in active files. See "To update file links" on page 107 for information about how 1-2-3 recalculates formulas linked to files on disk.

**Help** You can also change the order in which 1-2-3 recalculates the worksheet, setting it to recalculate by column, by row, or natural. For more information on recalculation methods, search on "Recalculation order" in Help.

Whenever 1-2-3 performs a recalculation pass, it recalculates only those formulas affected by the changes in data; it skips over any formulas not affected by those changes. This technique, called **optimal recalculation**, can minimize recalculation time considerably, especially in large worksheets that contain many unrelated formulas.

## Analyzing formulas

With the 1-2-3 audit feature, you can analyze the overall logic of a worksheet. Auditing is especially useful when you want to examine someone else's worksheet to identify the formulas and other data that the worksheet is based on. It's also helpful for reviewing your own worksheets when they start to get large and complex. You can use Tools Audit to find and analyze formulas, circular references, and DDE links.

### Why audit your worksheet?

With Tools Audit, you can quickly discover the source of errors or inconsistencies, and you can check if any ranges you want to delete are referred to by formulas. It's also useful when you want to modify formulas or their precedent and dependent data.

Using Tools Audit to identify dependent cells can also make what-if analysis easier. When you want to see the effects of changing a value, knowing the dependent cells affected by the change helps you make a speedy check of the results.

**Help** For more information on using Tools Audit, search on "Auditing formulas and values" in Help.

# 11 Calculating with @Functions

1-2-3 provides a set of more than 200 built-in formulas called @functions. The @function selector in the edit line provides an easy, reliable way to enter @functions. This chapter describes the format for @functions, how to enter an @function, how to customize the @Function menu, and how to use Help to find detailed information about each @function.

**Help** To browse through @functions by category in Help, search on "@Functions" and select the topic "@Function Categories."

## What is an @function?

An **@function** is a built-in formula in 1-2-3 that performs a specialized calculation. @Functions are a quick, easy way to build powerful worksheets. You can use an @function by itself, combine it with other @functions and formulas, or use it in a macro.

Some @functions are simple; for example, @SUM(D2..D7) adds the values in the range D2..D7 which is easier than writing out the formula +D2+D3+D4+D5+D6+D7. Other @functions calculate complex formulas. For example, @NPV calculates the net present value of a series of future cash-flow values.

## @Function format

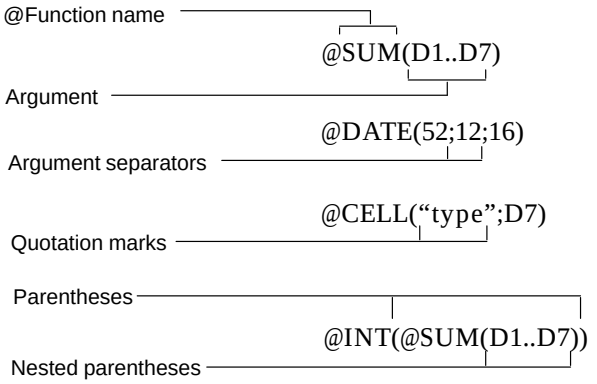
The format for most @functions has the following three parts:

- The @ (at sign), which you must enter as the first character
- The name of the @function
- One or more arguments enclosed in ( ) (parentheses)

Some @functions, such as @NOW, @RAND, and @TRUE, don't have arguments.

## Parts of an @function

The examples below show the different parts of an @function.




An **argument** is data you provide for 1-2-3 to use when it calculates the @function. Depending on the particular @function, an argument can be a single value, a range of cells, text, or another @function. The arguments in an @function can be any length as long as the total number of characters in the cell containing the @function doesn't exceed 512.

When an @function has arguments, they can be required or optional. You must enter required arguments when you use the @function. You can omit optional arguments. In the documentation, optional arguments are enclosed in [ ] (brackets).

If an @function contains more than one optional argument, you must use the arguments sequentially. You can't use an optional argument without using the optional arguments that precede it. You can, however, use an optional argument without using subsequent optional arguments. For example, the syntax of @VDB is

@VDB(*cost*,*salvage*,*life*,*start*,*end*,[*rate*],[*switch*])

The *rate* and *switch* arguments are optional. You can't use the *switch* argument without using the preceding *rate* argument. You can, however, use *rate* without using *switch*.

**Argument separators** separate two or more arguments. You can use three types of argument separators: , (comma), ; (semicolon), and . (period). A semicolon is always a valid argument separator. In addition, you can set either a period or comma as the argument separator.

The argument separator can't be the same as the decimal separator. Some countries use a comma as the decimal separator, while others use a period. So, if you use files with varying international settings for the decimal separator, it's best to use a semicolon as the argument separator.

**Help** For information about changing the argument separator, search on "Argument separators" in Help.

**Quotation marks** enclose the text for text arguments. For example, in the text @function @LOWER("Sales Forecast"), you enclose the text argument Sales Forecast in " " (quotation marks). 1-2-3 assumes that text not enclosed in quotation marks is a range name.

**Parentheses** enclose @function arguments. **Nested parentheses** enclose an @function that you use as an argument for another @function. For example, you use nested parentheses when you make @SUM and its argument the argument for @INT as follows: @INT(@SUM(D1..D7)).

## Argument types

1-2-3 @functions accept the following four types of arguments:

- A **condition** is an expression that uses a logical operator (=, <, >, <>, >=, <=, #NOT#, #AND#, and #OR#), or the address or name of a cell containing such an expression. You can also use a formula, @function, number, range name, cell address, or text as a condition argument. The @function evaluates the condition argument and proceeds according to whether it is true or false.
- A **location** is the address or name of a range, or a formula or @function that produces the address or name of a range. A location argument can refer to a single-cell or a multiple-cell range in one or more worksheets in a single file.
- **Text** is any sequence of letters, numbers, and symbols enclosed in quotation marks, the address or name of a cell that contains a label, or a formula or @function that produces a label. Text @functions use text arguments.
- A **value** is a number, the address or name of a cell that contains a number, or a formula or @function that produces a number.

## Entering an @function

You can enter an @function by typing it into a cell or by using the @function selector. Using the @function selector is the easiest, most reliable method because 1-2-3 automatically enters the @function in the correct format with the @function name, parentheses, argument placeholders, and argument separators.

### To enter an @function

1. Select the cell where you want to enter the @function.
2. Click the @function selector.

*You can also type @ in an empty cell, and then press* **F3 (NAME)** *to open the @Function List dialog box.*

3. If the @function you want appears on the @Function menu, choose it and skip to step 7. Otherwise, select List All.

Alphabetical list of all @functions

Syntax and description of the selected @function

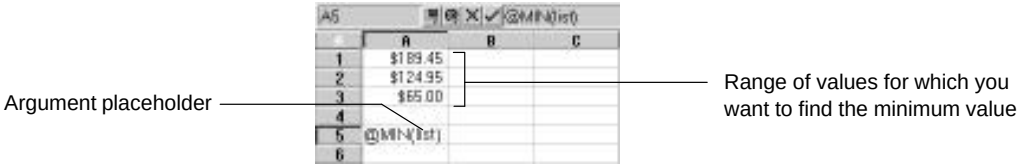
4. If you know the category of the @function you want, select the category from the Category drop-down box.

   The @Functions list box displays @functions in the category that you picked.

5. Select the @function from the @Functions list box.

**6.** Choose OK.

1-2-3 enters the @function name, placeholders for required and optional arguments, and argument separators. 1-2-3 highlights the first argument placeholder so it's ready for you to specify your actual argument.

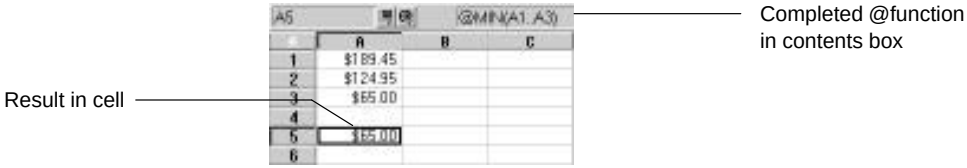



**7.** Replace the placeholders for required and optional arguments with your actual argument.

You can type a range address or name, choose a name from the navigator, or select a range in the worksheet. In the illustration above, *list* is the placeholder for a required argument. The actual argument is the range for which you want to find the minimum value with @MIN, A1..A3.

**8.** Click the Confirm button, or press **ENTER**.

The result, not the @function, appears in the cell. If the result of the @function is too long to fit in the cell, 1-2-3 displays *** (asterisks). To display the result, widen the column by double-clicking the column border to the right of the column letter. For more information, see "Changing column width" on page 132.

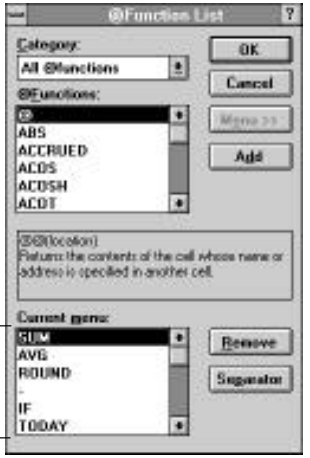


## Customizing the @Function menu

You can customize the @Function menu by adding and removing @functions at the top level of the menu. You can also add and remove separator lines between @functions in the menu. Adding frequently used @functions to the menu saves time because you can choose them without having to display a dialog box.

### To add an @function to the menu

1. Click the @function selector.
2. Choose List All.
3. If you know the category of the @function you want to add, select the category from the Category drop-down box.
4. Choose Menu >>.




@Functions currently displayed in the menu

5. Select the @function from the @functions list box.
6. Choose Add.

   1-2-3 appends the @function to the Current menu list.
7. To add a separator line below an @function on the menu, select the @function in the Current menu list, and choose Separator.
8. Choose OK.

The @functions and separators you added now appear in the menu when you click the @function selector.

### To remove an @function from the menu

1. Click the @function selector.
2. Choose List All.
3. Choose Menu >>.
4. Select the @function from the Current menu list box.
5. Choose Remove.
6. To remove a separator, select it in the Current menu list, and choose Remove.
7. Choose OK.

The @functions and separators you removed no longer appear in the menu when you click the @function selector.

## Learning about each @function

Help provides detailed information about each of the more than 200 @functions. The *User's Guide* doesn't list individual @functions.

### To find information about an @function

*You can also get help on individual @functions by typing the @function in an empty cell and pressing* **F1 (HELP).**

1. In an empty cell, type @
2. Press **F3 (NAME).**

   The @Function List dialog box appears, containing an alphabetical list of all @functions.

3. Select the @function you want in the @Functions list box.
4. Press **F1** .

1-2-3 displays a Help topic with detailed information about the @function including syntax, arguments, notes, and examples. To print the Help topic, choose File Print Topic in the Help window.

# 12 Changing the Worksheet's Appearance

You can enhance the appearance of your worksheets on screen and in print and make your presentations more effective. For example, you can change fonts, add colors and patterns, and put borders around ranges. This chapter describes how to style the worksheet, change column width and row height, and hide parts of the worksheet.

**Note** If Group mode is on, changes to a range's number format, fonts and attributes, colors and patterns, borders, alignment, row height, column width, protection setting, and hidden status affect the same range in all worksheets in the file.

## Changing the appearance of numbers

You can change the appearance of numbers, dates, and times by changing number formats. You use **number formats** to differentiate one kind of numeric data from another; for example, currency from percentages.

You can change the default number format for the current worksheet. You can also change the number format for a selected range or collection, and parts of a query table or chart.

*If you do not want 1-2-3 to format numbers automatically, choose Tools User Setup and deselect the Use Automatic format checkbox.*

The initial default number format is Automatic. 1-2-3 automatically formats data as Comma, Percent, Scientific, or a currency type, depending on the symbol you use when you enter the data. For example, if you enter a number followed by a % (percent symbol), 1-2-3 automatically formats the number as Percent.

1-2-3 supports 45 different currency formats, including one user-customizable format. You can use multiple currency formats in the same worksheet or file. You can choose a default currency format in the Tools User Setup dialog box, under the International options.

**Caution** If a .WK4 file contains multiple currencies, and you plan to use it in a previous release of 1-2-3, or if you plan to save the .WK4 file under a different file format, see page 300.

1-2-3 automatically formats dates entered as 09-Apr-93, 09-Apr, or 04/09/93, and times entered in any of the standard time formats except hh.mm (hour.minutes).

**Help** The sample box in the Number Format dialog box shows how each format changes the appearance of a number. For a detailed description of each number format, search on "Number formats" in Help.

**Note** Formats affect only the onscreen and printed appearance of numbers, dates, and times; they don't affect the way 1-2-3 stores these values or uses them in calculations.

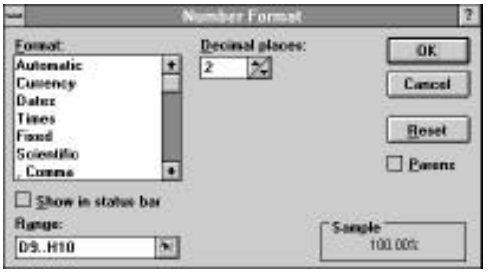
## To change a worksheet's default number format

You can change the default number format for the current worksheet.

1. Choose Style Worksheet Defaults.
2. Under Number Format, choose a format from the Format drop-down box.
3. Choose OK.

## To change the number format of a range or collection

1. Select the range or collection.
2. Choose Style Number Format.




*You can also click the format and decimal selectors on the status bar.*

3. Select a format from the Format list box.

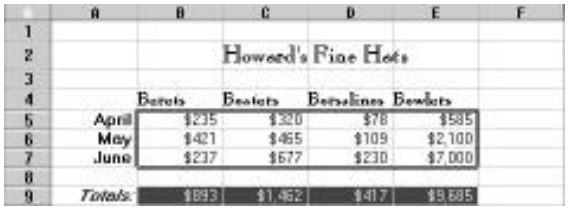
   The dialog box displays a sample of the format.
4. If you select Fixed, Scientific, Currency, Comma, or Percent, the Decimal places text box appears. Click the arrows or enter the number of decimal places (0 through 15) you want 1-2-3 to display.
5. If you select Currency, the Currency list box appears. Select the currency you want 1-2-3 to display.
6. Choose OK.

**Shortcut** Select the range or collection and click one of the SmartIcons shown at left to apply Currency, Percentage, or Comma format with two decimal places.

> **Note** If you select a format that adds characters such as $ (dollar sign) or , (comma), the width of the cell may not be large enough to display the number and the extra characters. In this case, 1-2-3 replaces the number with *** (asterisks). To display the number, widen the column by double-clicking the column border to the right of the column letter. For more information, see "Changing column width" on page 132.

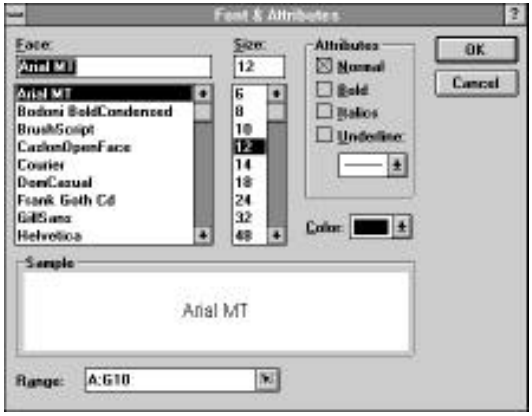
## Changing font and attributes

Fonts and attributes determine how characters look on the screen and in print. A **font** is a typeface of a particular size, such as Times 12 point, or Helvetica 10 point. **Attributes** are style characteristics such as boldface, underlining, italics, and color. You can change the font and attributes for a selected range or collection, as shown below.




### To change font and attributes

1. Select the range or collection.
2. Choose Style Font & Attributes.



*You can also use the typeface and point-size selectors on the status bar.*

3. Select a typeface from the Face list box.
4. Select a point size from the Size list box.
5. To add bold, italics, or underlining, select the Bold, Italics, or Underline check box.
6. If you selected Underline, select a line style from the Underline drop-down box.
7. To remove bold, italics, or underline, select Normal.
8. Select a color from the Color drop-down box.
9. Choose OK.

**Shortcut** To apply text attributes, select the range or collection and click one of the SmartIcons shown below.

Bold

Italics

Single underline

Double underline

Remove bold, italics, and underline

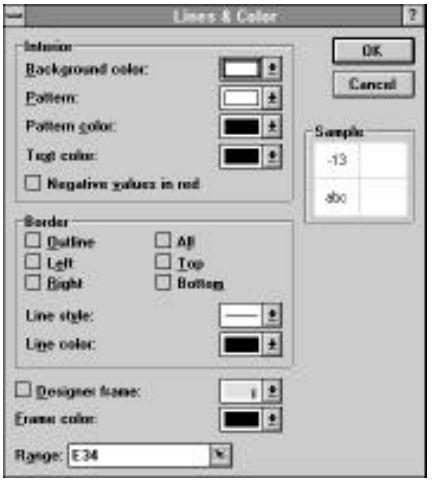
## Changing colors and patterns

Applying a color to a range accentuates the range on screen and draws attention to the data. For example, you can emphasize a range by changing its background color and pattern. It's also an effective way to group similar data visually. For example, you can set headings in one color and numbers in another.

**Help** You can also change the color 1-2-3 uses to display grid lines. For more information, search on "Grid lines" in Help.

### To change colors and patterns

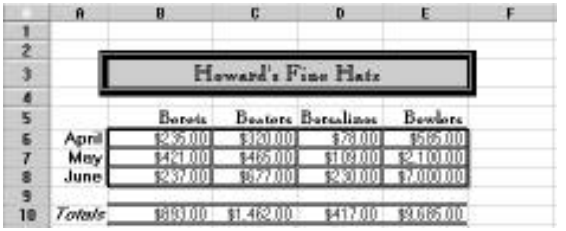
1. Select the range or collection.
2. Choose Style Lines & Color.




3. To change the background color, select a color from the Background color drop-down box.
4. To change the background pattern, select a pattern from the Pattern drop-down box.
5. To change the color of the background pattern, select a color from the Pattern color drop-down box.
6. To change the color of data in the range, select a color from the Text color drop-down box.
7. To display negative values in red, select the Negative values in red check box.
8. Choose OK.

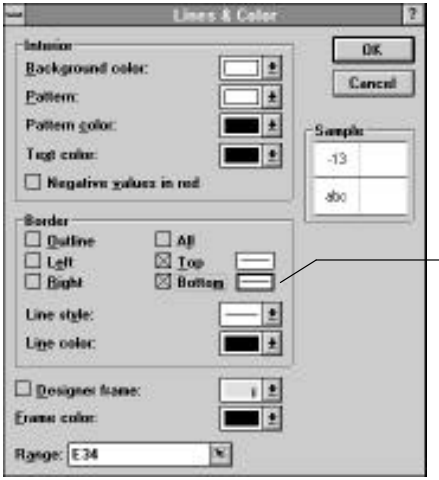
## Adding borders and frames

To emphasize a range and the data in it, you can add borders and designer frames. As shown below, you can choose from a variety of frames and border styles, and you can add borders to different edges of a range.



## To add borders and frames

1. Select the range or collection.
2. Choose Style Lines & Color.
3. Under Border, select one or more options.
   - Outline draws a line around the outside edge of the range.
   - Left, Right, Top, and Bottom draw a line along the specified edge of each cell in the range.
   - All draws a line around all edges of each cell in the range.

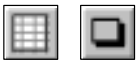



A sample line appears next to the check boxes you selected

4. To apply a style and color to a border line, click the sample line next to the check box; then select a style from the Line style drop-down box and a color from the Line color drop-down box.
5. To add a designer frame to the range or collection, select a frame from the Designer frame drop-down box.
6. To apply a color to the designer frame, select a color from the Frame color drop-down box.
7. Choose OK.

To remove borders and frames, select the range or collection; choose Style Lines & Color; deselect the borders and frame options; choose OK.

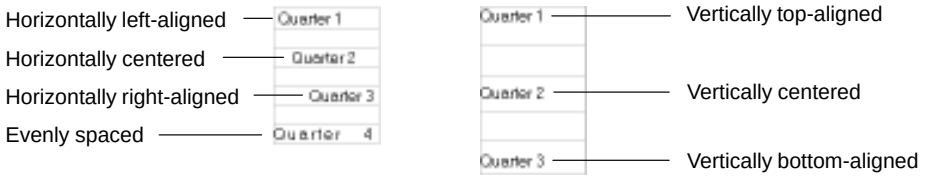
**Note** If you put a border around a 3D range, 1-2-3 treats the selection as a group of two-dimensional ranges, putting borders in each worksheet separately.



**Shortcut** Select a range and click the SmartIcons at left to add an outline or a drop shadow to the range.

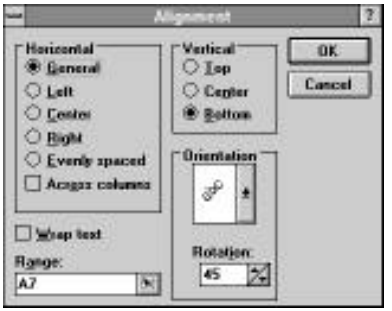
## Changing alignment

You can change the alignment for both values and labels in a range. By default, 1-2-3 aligns values horizontally to the right and labels horizontally to the left; and aligns both values and labels vertically to the bottom. The illustration below shows examples of different alignments.




## To change alignment

1. Select the range or collection.
2. Choose Style Alignment.




*You can also use label-prefix characters to align text horizontally. For more information, see "Entering text" on page 77.*

3. Under Horizontal, select an option.
   - General aligns labels to the left and values to the right.
   - Left
   - Center
   - Right
   - Evenly spaced stretches data evenly across the cell. It has no effect on data that ends with a . (period), ! (exclamation point), ? (question mark), or : (colon).
4. Select the Across columns check box to align the data in the leftmost cell across the columns in the range, according to the horizontal alignment.

   For example, when the horizontal alignment is Center, Across columns centers the data in the leftmost cell across the entire range, as shown below.

**Before**

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Yearly Totals | | | | | |
| 2 | | 1990 | 1991 | 1992 | 1993 | |
| 3 | Dublin | $578,395 | $674,873 | $589,654 | $764,321 | |
| 4 | London | $476,456 | $325,687 | $567,234 | $764,321 | |

**After**

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | Yearly Totals | | | |
| 2 | | 1990 | 1991 | 1992 | 1993 | |
| 3 | Dublin | $578,395 | $674,873 | $589,654 | $764,321 | |
| 4 | London | $476,456 | $325,687 | $567,234 | $764,321 | |

**Note** When you select Across columns, make sure the cells to the right of the label you want to align are blank.

**Before**

This text needs to be wrapped

**After**

This text needs to be wrapped

5. To wrap text within a cell, select the Wrap text check box. 1-2-3 adjusts row height to fit the wrapped text.
6. Under Vertical, select Top, Center, or Bottom to align data vertically in a cell.

   **Note** Data appears vertically aligned in a cell only when the height of the row containing the cell is larger than the largest font in the row.
7. To rotate the text in a cell, select an orientation from the Orientation drop-down box. If you want, specify a rotation angle from 0 to 90 in the Rotation text box.
8. Choose OK.

**Shortcut** To align data, select the range or collection and click one of the SmartIcons below.

Left

Center

Right

Evenly spaced

Rotate

## Copying and deleting styles

You can use Style Fast Format to quickly copy styles from one range to other ranges. You can paste the number format, font and attributes, colors, patterns, borders, alignment, named style, and protection setting this way.

When you copy styles into a range, any data in the range takes on the copied styles. New data you enter in the range appears in the copied styles.

You can use Edit Clear to delete styles from a range without deleting the data in the range. When you delete styles in a range, 1-2-3 resets the range to the default styles.

## To copy styles

1. Select the range whose styles you want to copy.
2. Choose Style Fast Format.

   The mouse pointer changes from an arrowhead to a paintbrush.
3. Select the range or collection you want to format.
4. To format other ranges, repeat step 3.
5. To turn off fast formatting, choose Style Fast Format or press **ESC**.

**Shortcut** Select the range whose styles you want to copy, click the icon at left, and select the range you want to format. To turn off fast formatting, click the icon again or press **ESC**.

## To delete styles

1. Select the range or collection whose styles you want to delete.
2. Choose Edit Clear.
3. Select Styles only.
4. Choose OK.

**Shortcut** Select the range and click the icon at left to delete the styles.

## Using named styles

You can name the styles of a selected cell and then apply this named style to a selected range or collection. A named style can include the number format, font and attributes, colors, patterns, borders, and alignment of the selected cell. You can define 16 named styles.

**Help** You can also style a range with one of the built-in templates in the style gallery. For more information, search on "Templates" in Help.

## To define or delete named styles

1. Select a cell whose style you want to define as a named style.
2. Choose Style Named Style.

3. Enter a name of up to 35 characters in the Style name text box.
4. Choose Define.

   You can use the range selector to select another cell whose style you want to define as a named style; then repeat steps 3 and 4.
5. To delete a named style, select it from the Existing styles list box and choose Clear.

   Deleting a named style doesn't affect any of the ranges where you previously applied this style.
6. Choose Close.

## To apply a named style

1. Select the range where you want to apply a named style.
2. Choose Style Named Style.
3. Select a named style from the Existing styles list box.
4. Choose OK.

You can also use the style selector on the status bar to apply a named style to a selected range or collection.

## Changing column width

When a value is too wide to fit in a cell, it appears in scientific notation or as a line of **** (asterisks). To display the value, you must widen the column.

You can change the width of columns by dragging, or by using Style Column Width. Use Style Column Width to change the column to a specific width, reset to the default width, or set the width to fit the largest entry in the column.

## To change a column by dragging

*To change the column width to fit the largest entry in the column, double-click the border to the right of the column letter.*

1. Move the mouse pointer to the letter of the column.
2. Point at the right column border.

   The mouse pointer changes to a black two-headed horizontal arrow.
3. Drag left to narrow the column or right to widen it.
4. Release the mouse button when the column is the width you want.

## To change more than one column by dragging

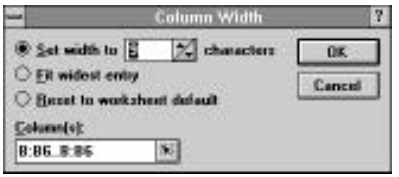
1. Select the columns.
2. Point to a border between any of the column letters in the selected columns.

   The mouse pointer changes to a black two-headed horizontal arrow.
3. Drag left to narrow the column or right to widen it.
4. Release the mouse button when the column is the width you want.

1-2-3 changes the width of all the selected columns to match the one you dragged.

## To change columns to a specified width

1. Select a range that includes cells in the columns you want to change.
2. Choose Style Column Width.




3. Select an option.
   - "Set width to" adjusts the column to the width you specify. Click the arrows or enter a number from 1 to 240 in the characters text box.
   - "Fit widest entry" adjusts each column to the width of the widest entry in the selected range in that column.
   - "Reset to worksheet default" adjusts the columns to the default width defined with Style Worksheet Defaults.
4. Choose OK.

**Help** For more information about how fonts, values, and labels can affect column width, search on "Width" in Help.

## Changing row height

1-2-3 automatically adjusts row height to match the height of the largest font of the data you put in the row. You can also change row height manually by dragging a row border or by using Style Row Height.

### To change a row by dragging

*To reset the row height to fit the largest font in the row, double-click the border below the row number.*

1. Move the mouse pointer to the number of the row.
2. Point to the lower border of the row.

   The mouse pointer changes to a black two-headed vertical arrow.
3. Drag up to narrow the row or down to widen it.
4. Release the mouse button when the row is the height you want.

### To change more than one row by dragging

1. Select the rows.
2. Point to a border between any of the row numbers in the selected rows.

   The mouse pointer changes to a black two-headed vertical arrow.
3. Drag up to narrow the row or down to widen it.
4. Release the mouse button when the row is the height you want.

1-2-3 changes the height of all the selected rows to match the one you dragged.

### To change rows to a specified height

1. Select a range that includes cells in the rows you want to change.
2. Choose Style Row Height.

3. Select an option.
   - "Set height to" changes row height to the height you specify. Click the arrows or enter a height from 1 through 255 in the points text box.

     When you set the row height to a specific number of points, it no longer automatically adjusts to fit the largest font in the row.
   - "Fit largest font" resets the height of each selected row to the height of the largest font in the row.
4. Choose OK.

## Hiding data

You can hide data in a range so that the range appears blank. You can also hide a column or a worksheet so that the entire column or worksheet disappears from the worksheet display. You can't hide a row.

Hiding data is a good way to keep other users of your file focused on what you want them to see rather than on confidential or distracting data. For example, suppose you have a file with two worksheets in it. The first worksheet contains data and a chart. The second contains macros and calculations. To help other users focus on the chart and data that you want them to see, hide the worksheet containing the macros and calculations.

You can perform 1-2-3 operations on ranges in hidden columns or worksheets by typing the address or range name in a dialog box or by selecting the surrounding columns or worksheets. Formulas that refer to data in hidden columns or worksheets continue to work correctly. To make formulas refer to ranges in hidden columns or worksheets, type the address in the formula instead of selecting the range.

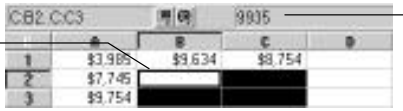
You can prevent changes to hidden data by protecting it and sealing the file. For more information about sealing a file, see page 153.

> **Caution** If hidden data isn't protected and sealed, you can accidentally change it. For example, you can accidentally delete text, or change settings such as font and color. If you enter new data in a hidden cell, the new entry replaces the old one but is still hidden. When you redisplay the hidden cell, it will show the changed data or settings.

## To hide data in a range

1. Select the range or collection.
2. Choose Style Number Format.
3. Select Hidden from the Format list box.
4. Choose OK.

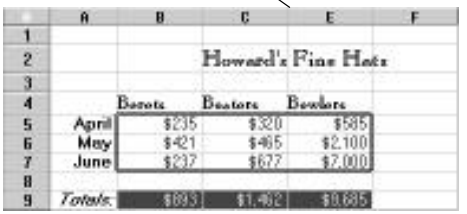
The contents of the range are no longer visible. If you select a cell in this hidden range, however, the contents of the cell appear in the contents box, unless the file is sealed.




**Note** If you print a range that contains hidden cells, the contents of the hidden cells don't print.

## To hide columns or worksheets

When you hide a worksheet, 1-2-3 hides the tab for that worksheet. When you hide a column, 1-2-3 hides the letter for that column, as shown below. You can't move the cell pointer to hidden columns or worksheets unless you redisplay them.




1. Select the entire column or worksheet.
2. Choose Style Hide.

**Note** If you print a range that contains hidden columns or worksheets, the hidden columns or worksheets don't print.

## To display hidden columns or worksheets

1. Select a cell or a range of cells in the columns or worksheets surrounding the columns or worksheets you want to display. Do not select entire columns or worksheets.

   For example, to display hidden column D, select a cell or a range of cells in columns C and E. To display worksheets B and C, select a cell or a range of cells in worksheets A and D.
2. Choose Style Hide.

3. Select Column or Sheet.
4. Choose Show.

## Related Help topics

There are many default settings that can affect the appearance of data and the worksheet. For information about setting defaults, search on "Default settings" in Help.

For a tutorial lesson about ways to enhance a worksheet's appearance, choose Help Tutorial and select Lesson 3.

# 13 Printing Data

You can print ranges, charts, maps, drawn objects, and query tables. To enhance your printed pages, you can add headers, footers, center your data horizontally or vertically for printing, print titles and page breaks; shrink and enlarge printed data; change the page orientation; and save named page settings for printing. You can also preview up to nine pages at a time and print directly from the Print Preview window. This chapter describes how to print data, preview printing, and enhance your printed pages.

## Quick printing

*The fastest way to print the current worksheet is to click the Quick Print icon, shown above. Choose Tools SmartIcons to add this icon to your set of SmartIcons.*

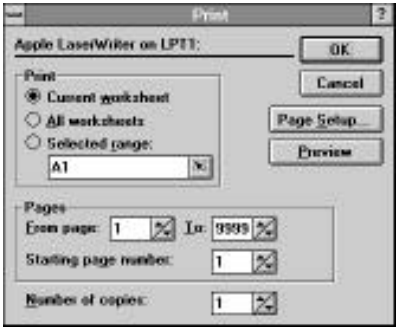
The quickest way to print is to use the default settings. Generally, printing requires only the default printer and default page settings. You can customize the page settings as described later in this chapter. However, you can also print right away without changing any defaults.

You can print the current worksheet, the entire file, a range, or a collection. By default, 1-2-3 prints any charts, maps, drawn objects, and query tables within your print ranges. For information about changing this default, see "To hide or show worksheet elements in print" on page 150. You can also print a chart, map, drawn object, or query table by itself without any worksheet data.

> **Note** Before you print, make sure a printer was installed during the Windows installation procedure. To see if a printer is installed on your system, choose File Printer Setup. 1-2-3 displays the names of all installed printers in the Printers list box. If the list box doesn't display any printer names, see your Windows documentation for information about using the Windows Control Panel to install a printer.

## To print the current worksheet or file

1. Move the cell pointer to the worksheet or file.
2. Choose File Print or press **CTRL+P**.




3. Under Print, select an option.
   - Current worksheet prints the active area of the current worksheet.
   - All worksheets prints the entire file.
4. Choose OK.

1-2-3 prints the current worksheet or the entire file, including all cell contents, charts, maps, drawn objects, and query tables.

## To print a selected range or collection

1. Select the range or collection.

   If you want to print a long label, make sure you select the cells the label overlaps, as well as the cell containing the label. For example, to print a long label entered in A2 that overlaps B2 and C2, be sure to include cells A2, B2, and C2 in the range.

   If you want to print a chart, drawn object, or query table make sure that it's *completely* within the range or collection.

2. Choose File Print or press **CTRL+P**.
3. Choose OK.

1-2-3 prints the range or collection, including all cell contents, charts, maps, drawn objects, and query tables.

## To print charts or query tables only

You can select charts, maps, and query tables to print without printing data in cells. The drawn objects you can print are lines, arrows, shapes, text blocks, pictures, and embedded objects. Printing charts, maps, drawn objects, and query tables without other data is useful when you want to make overhead transparencies or prints for a presentation.

1. Select one or more charts, drawn objects, or query tables.
2. Choose File Print or press **CTRL+P**.
3. Choose OK.

**Note** 1-2-3 automatically prints charts, maps, and drawn objects centered on the page.

## Print previewing

Before printing, you can preview how your pages will look when printed. Previewing is useful for checking that page breaks occur where you want them. It's also useful for checking that headers, footers, and the layout of printed pages is what you want.

1-2-3 displays a preview of the printed page in the Print Preview window. 1-2-3 displays the preview pages in black and white or color, according to the type of printer you selected using File Printer Setup.

If the page settings aren't what you want, you can use an icon in the Print Preview window to display the Page Setup dialog box. You can use the icons and the scroll bars in the Print Preview window to move around in the Print Preview window. You can also use the icons to zoom in and zoom out, and to print.

### To preview pages

1. Select what you want to preview.

   Move the cell pointer to the worksheet or file you want to preview; or select a range, collection, chart, map, drawn object, or query table.

2. Choose File Print Preview.

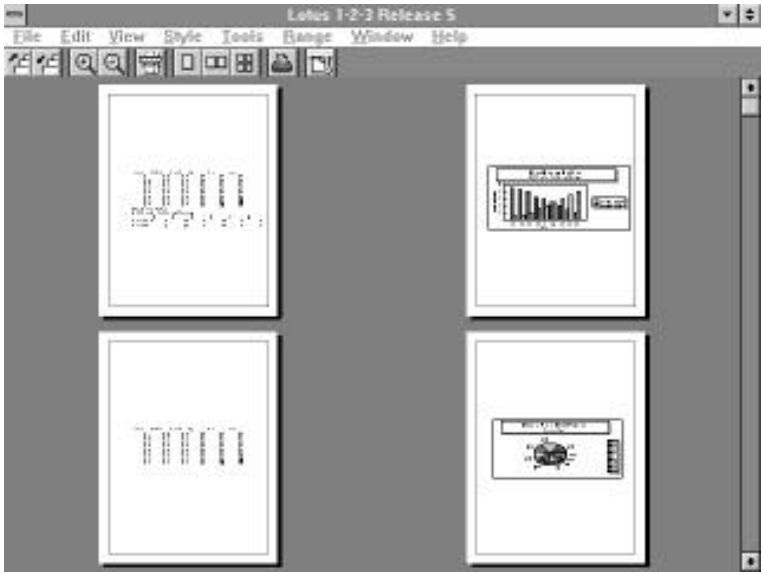
   Depending on what you selected to preview, 1-2-3 displays a dialog box like the one shown below.

All worksheets are selected for previewing

3. Under Preview, select Current worksheet, All worksheets, or Selected range, chart, drawn object, or query table.

4. To change the default pages to preview, specify them under Pages.
5. Choose OK.

1-2-3 displays the Print Preview window. If you have multiple pages to view, you can click the icon shown left to see up to nine pages at once.




6. Use the icons, as described below:

| *Click* | *Or press* | *To* |
|---|---|---|
| | **ENTER** or **PG DN** | Display the next page |
| | **PG UP** | Display the previous page |
| | **GRAY MINUS** | Zoom out |
| | **GRAY PLUS** | Zoom in |
| | * (asterisk) | Display one full page |
| | | Display two facing pages |

*Continued*

| *Click* | *Or press* | *To* |
|---|---|---|
| | | Display multiple pages |
| | | Change the page setup |
| | | Print |
| | **ESC** | Close the Print Preview window |

After zooming a page, you can use the scroll bars or ↑, ↓, →, ← to move around the page. To return to the original unzoomed state, click the icon to display one full page, shown in the above table, or press * (asterisk).

## Adding headers and footers

A **header** is text printed below the top margin of each page, and a **footer** is text printed above the bottom margin. You can enter up to 512 characters of text in a header or footer; however, 1-2-3 doesn't print any text that extends beyond the right margin of the printed page.

As well as entering text in the headers and footers, you can use the buttons in the Page Setup dialog box to enter the date or time of printing, the page number, the file name, or data from a cell in the worksheet.

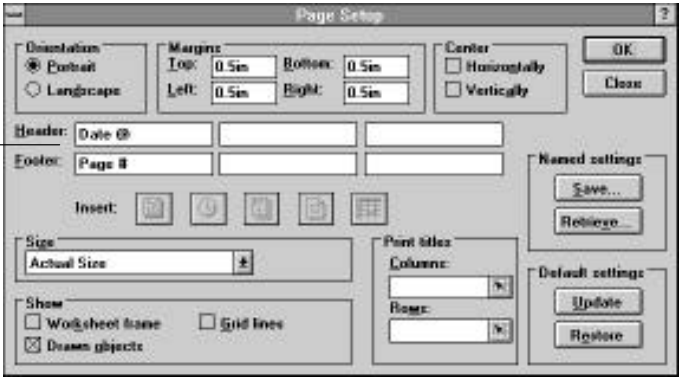
If you type @ (at sign) or + (plus sign) to enter the date or time or use a button in the Page Setup dialog box, 1-2-3 updates the date and time each time you print. If you don't want the date and time to update each time you print, you can type them in.

Also, you can combine the date, time, page number, and file name with other header and footer text that you type. For example, you can type Page and then enter # (number sign) or click the page number button. You can't combine the contents of a cell with other text you type.

## To add headers and footers

1. Choose File Page Setup.

Enter headers and footers in these boxes to align text to the left, center, and right




2. Next to Header or Footer, enter text in one or more of the text boxes.

You can also do any of the following:

| *To enter* | *Click* | *Or type* |
|---|---|---|
| The date of printing | | @ (at sign) |
| The time of printing | | + (plus sign) |
| The page number | | # (pound sign) |
| The file name | | ^ (caret) |
| The contents of a cell | ...then type the address or name of a cell | \ (backslash) ...then type the address or name of a cell |

3. Choose OK.

**Note** You can't use a | (vertical bar) character in a header or footer. Also, to display @ (at sign), + (plus sign), # (pound sign), ^ (caret), or \ (backslash) in a header or footer, enter an ' (apostrophe) immediately before the character. For example, enter '# to display #.

## Adding and removing page breaks

1-2-3 automatically paginates what you're printing based on how many complete columns and rows can fit on the current page. Page breaks never occur partway through columns or rows.

After you preview or print a range, the automatic page breaks appear as dashed lines in the print range. If the pages don't automatically break where you want, you can add page breaks to keep related data together or to print certain data on separate pages.

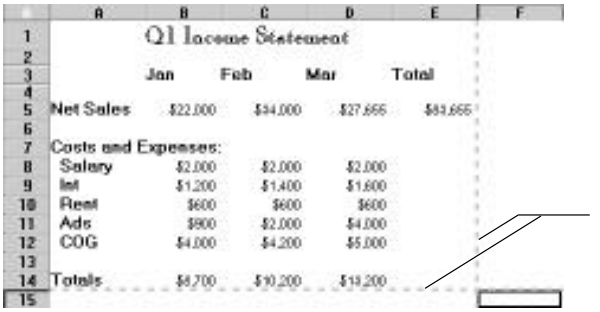
> **Note** You can change the way pages break by setting different print margins (see page 148), shrinking or enlarging printed data (see page 149), and by changing the page orientation (see page 150). You can also change settings in the worksheet that affect page breaks, such as column width or row height. See Chapter 12 for more information.

### To add a page break

1. Select a cell below the row or to the right of the column where you want the page to break.
2. Choose Style Page Break.
3. Do one or both of the following:
   - To add a page break above the row containing the selected cell, select the Row check box.
   - To add a page break to the left of the column containing the selected cell, select the Column check box.
4. Choose OK.

**Shortcut** The SmartIcons at left insert page breaks above or to the left of the current cell.

When you print the data, 1-2-3 starts a new page at the location you specified. For example, the following illustration shows a dashed line indicating a page break along the row above and the column to the left of the selected cell.




**Note** 1-2-3 doesn't automatically break pages between worksheets in a multiple-sheet file. To start each worksheet on a new page, insert a page break at the top of each worksheet after worksheet A.

### To remove a page break

1. Select a cell below the row and to the right of the column where the page breaks.
2. Choose Style Page Break.
3. Deselect the Row check box, the Column check box, or both check boxes.
4. Choose OK.

## Adding print titles

Adding print titles to printed pages is like freezing titles in your onscreen worksheet. Print titles help you keep track of the categories of data in your printed worksheet. You can specify columns as vertical print titles, rows as horizontal print titles, or both. Columns print along the left edge, and rows along the top edge of each page.

Ranges in the left column and top row are set as print titles and appear on every printed page

You can select as many contiguous columns and rows as you like and add them as print titles. It's practical to set only a few columns and rows as titles, however, so you can still fit all the data you want to print.

1-2-3 uses as print titles only the rows and columns that correspond to your print range. For example, if you specify D3..D15 as a print range and column A as a print title, 1-2-3 prints the contents of A3..A15 as the print title.

## To add print titles

*Don't include the print titles in your print range, or 1-2-3 will print them twice.*

1. Choose File Page Setup.
2. Under Print titles, specify a range for vertical titles in the Columns text box and a range for horizontal titles in the Rows text box.

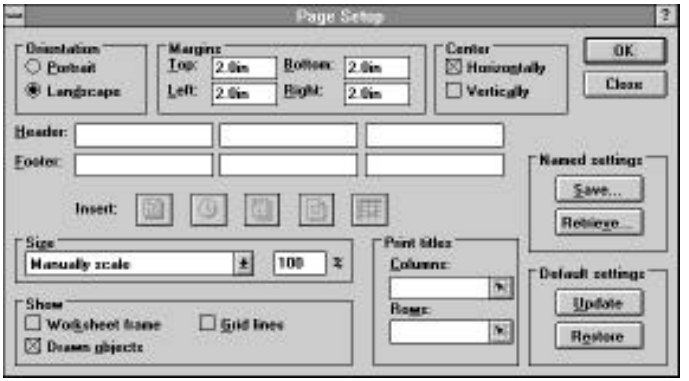
   The range you specify needs to include only one cell from each column or row.
3. Choose OK.

**Shortcut** Select a range and click one of the SmartIcons at left to set the selected column or row as a vertical or horizontal print title.

## Enhancing your printed pages

You can enhance the appearance of your printed pages by customizing the page settings. You can change print margins; center a selection for printing horizontally or vertically; shrink or enlarge printed data; hide or show the worksheet frame, grid lines, and drawn objects; and change the page orientation.

You change page settings by choosing File Page Setup. You can also go to Page Setup from the Print dialog box and the Print Preview window. In all cases, the following dialog box appears:




### To change print margins

You can change the top, bottom, left, and right print margins If the printer you're using has minimum margins larger than what you enter, edges of your printed pages may be cut off. If this happens, enter larger margins.

1. Choose File Page Setup.
2. Under Margins, click the arrows or enter a measurement for each print margin in the Top, Bottom, Left, or Right text boxes.

   To specify a margin in millimeters or centimeters, type mm or cm after the measurement number.
3. Choose OK.

### To center a selection for printing

1. Choose File Page Setup.
2. Under Center, select one or both options.
3. Choose OK.

**Note** Selected charts, maps, and drawn objects are always centered on the page, except when printed with a range.

**Shortcut** Use the SmartIcons at left to center the current selection horizontally, vertically, or horizontally and vertically on the page.

## To shrink or enlarge printed data

You can reduce the size of printed worksheet data to fit all columns on a single page, all rows on a single page, or everything on a single page. You can also shrink or enlarge printed data by a percentage. When you shrink data to fit on a single page, keep in mind that the more data you try to fit, the smaller and more difficult it becomes to read. You can also shrink or enlarge a printed chart, or drawn object.

### To shrink or enlarge a range, collection, or worksheet

1. Choose File Page Setup.
2. Under Size, select an option.
   - Actual size prints the selection in the size it appeared on screen, starting at the top left corner of the page.
   - Fit all to page fits all the data on a single printed page.
   - Fit columns to page shrinks all the columns of data to fit on a single printed page. The printed output is more than a single page if the number of rows exceeds what can fit on one page.
   - Fit rows to page shrinks all the rows of data to fit on a single printed page. The printed output is more than a single page if the number of columns exceeds what can fit on one page.
   - Manually scale shrinks or enlarges the printed data by a percentage, from 15 to 1000, you enter in the text box. For example, enter 75 to shrink the selection to 75% of its original size.
3. Choose OK.

*You can also try changing the page orientation to landscape to fit a large number of columns on the page. See page 150 for information.*

**Shortcut** The SmartIcons at left change the page setting to fit all columns, all rows, or all data on a single page.

### To shrink or enlarge a chart or drawn object

1. Choose File Page Setup.
2. Under Size, select an option.
   - Actual size prints the object in the size it appeared on screen, centered on the page. A large chart, map, or other drawn object might not entirely fit on a single printed page. 1-2-3 then prints one page with as much of the chart, map, or drawn object as will fit.

- Fill page shrinks or expands the object, changing its proportions, to fit on one page.
- Fill page but keep proportions shrinks or enlarges the selected object, but maintains its proportions.

## To hide or show worksheet elements in print

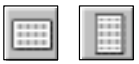
You can print a worksheet showing the worksheet frame, grid lines, charts and other drawn objects; or you can hide these elements for printing. For example, for your own reference, one printed version of a worksheet could show grid lines and the worksheet frame and hide drawn objects. Another version, for presentation, could hide the frame and grid lines, but show all the charts and other drawn objects.

1. Choose File Page Setup.
2. Under Show, select or deselect one or more options: Worksheet frame, Grid lines, Drawn objects.
3. Choose OK.

## To change page orientation

You can change the orientation of printed pages from **portrait** (upright) to **landscape** (sideways). If you have many columns of data, landscape printing may help you fit all the columns on a single page. You can also try reducing data to fit it on a single page. For information about reducing the size of printed data, see page 149.

1. Choose File Page Setup.
2. Under Orientation, select an option.
   - Landscape prints sideways.
   - Portrait prints upright.
3. Choose OK.



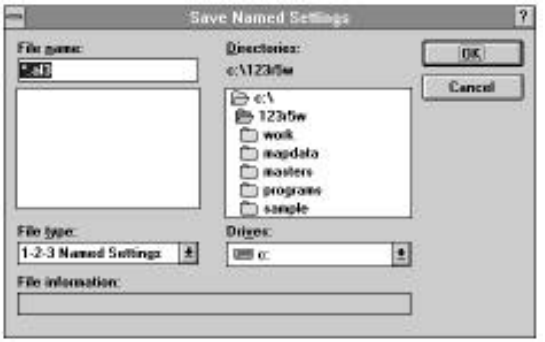
**Shortcut** The SmartIcons at left change the page orientation to landscape or portrait.

## Using named page settings

After you've used the page setup options to create page settings, you can name the page settings and save them to use any time you print. This way you can easily apply a complex combination of page settings to different data. You can also use named page settings to print the same data in different ways; for example, with grid lines and without. Named page settings include the print range and all the options you can set in the Page Setup dialog box.

## To name and save page settings

1. Choose File Page Setup.
2. Under Named settings, choose Save.




3. Enter a name of up to 15 characters in the File name text box.
4. Choose OK.

   You return to the Page Setup dialog box.
5. Choose OK.

1-2-3 saves the named page settings in a file with the extension .AL3.

## To use named page settings

1. Choose File Page Setup.
2. Under Named settings, choose Retrieve.

3. Select a named setting from the File name list box.
4. Choose OK.

   You return to the Page Setup dialog box.
5. Choose OK.

The settings you retrieved are now the current page settings; 1-2-3 will print according to these settings until you change them.

## Related Help topics

You can use File Printer Setup to change the default printer. For more information search on "Printers" in Help and select the "File Printer Setup" topic.

You can also change or restore the default page settings. For information, search on "Default page settings" in Help.

# 14 Protecting Data

Sometimes your files contain data you don't want others to change or see. For example, you want to prevent others from changing a set of formulas, or you want to limit who can open a file containing confidential financial data. This chapter describes how to protect data by sealing a file or by preventing others from opening a file.

## Sealing a file

**Sealing** a file prevents changes to cell contents, styles, and settings. When you seal a file, others can open the file. However, unless they know the password, they can't change data in the file except in ranges you specifically unprotected before you sealed the file.

When a file is sealed, you can't show hidden worksheets and columns, or insert and delete rows, columns, or worksheets. You also can't change protection settings, file reservation status, range names, style settings, formats, alignments, column width, row height, page breaks, frozen titles, drawn objects, or query tables.

> **Caution** Remember your password for sealing a file. When you seal a file with a password, you can unseal it again *only* if you enter the exact password.

### To seal a file

1. Choose File Protect.

2. Under File protection, select the Seal file check box.

3. Choose OK.

   1-2-3 prompts you to enter a password to seal the file.

4. Enter a password in the Password text box.

   A password can include 15 characters or less. 1-2-3 displays an * (asterisk) for each character as you enter the password. 1-2-3 is case-sensitive for passwords, so you must remember the exact combination of uppercase or lowercase letters you use when you create the password.

5. Enter the same password in the Verify text box.
6. Choose OK.

1-2-3 dims the menu commands for any actions that you can't perform when a file is sealed.

**Note** Sealing a file with a password is different from saving a file with a password. For information about saving a file with a password, see page 155.

## To seal a file and leave specified ranges unprotected

When you seal a file, you can leave specified ranges unprotected so others can enter data in these ranges. Others can change the contents of the specified ranges, but not the styles.

1. Select the range or collection where you want to allow changes.
2. Choose Style Protection.

3. Select the "Keep data unprotected after file is sealed" check box.
4. Choose OK.
5. Use File Protect to seal the file as described on page 153.

After you seal the file, the status bar displays Pr when the cell pointer is on a protected cell, and U when the cell pointer is on an unprotected cell.

### To reprotect ranges

1. Unseal the file by choosing File Protect, deselecting the Seal file check box, and choosing OK.

   1-2-3 prompts you to enter a password to unseal the file.
2. Enter the password and choose OK.
3. Select the unprotected range or collection you want to reprotect.
4. Choose Style Protection.
5. Deselect the "Keep data unprotected after file is sealed" check box.
6. Choose OK.
7. Use File Protect to seal the file again, as described on page 153.

## Preventing others from opening a file

You can limit who can open a file by saving it with a **password**. Only users who know the password can open, copy, or print the file. You can attach a password to a file when you save it with File Save As.

**Help** If you work on a network, you can also limit access to a file by getting the file reservation. For information about getting the file reservation, search on "Reservation" in Help.

### To limit access to a file

1. Make sure the cell pointer is in the file you want to save.
2. Choose File Save As.
3. Under Save, select the "With password" check box.
4. Choose OK.

   1-2-3 displays the Password dialog box.
5. Enter a password in the Password text box.

   A password can include 15 characters or less. 1-2-3 displays an * (asterisk) for each character as you enter the password. 1-2-3 is case-sensitive for passwords, so you must remember the exact combination of uppercase or lowercase letters you use when you create the password.

6. Enter the same password in the Verify text box.
7. Choose OK.

**Caution** Remember your password. When you save a file with a password, you can open it again *only* if you enter the exact password. Any user who knows the password can change or remove it. If you try unsuccessfully to open a password-protected file, check to see if another user who knew the original password changed it.

## To delete a password

1. Make sure the cell pointer is in the file whose password you want to delete.
2. Choose File Save As.
3. Under Save, deselect the "With password" check box.
4. Choose OK.

**Note** Only users who know the password can open the file and delete the password.

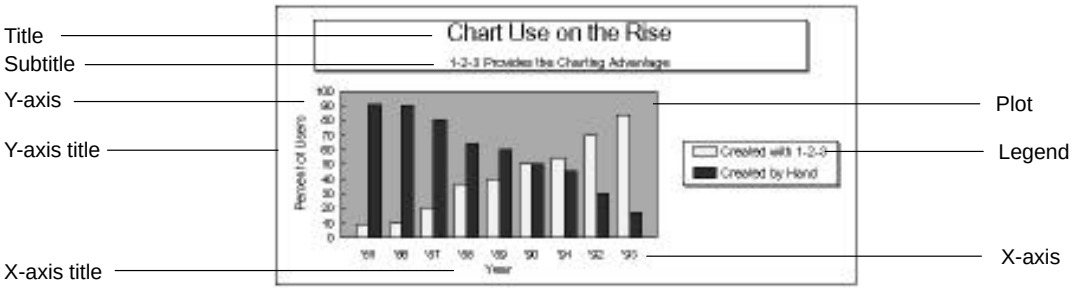
# 15 Working with Charts and Maps

1-2-3 produces presentation-quality charts right on the worksheet. You can create many different chart types in 2D and 3D, and you can change easily from one type to another. This chapter describes how to create 1-2-3 charts, change chart types, use chart names, enhance charts, and create maps.

> **Note** You work with charts the same way as you work with other drawn objects. For information about selecting, sizing, moving, copying, deleting, and styling drawn objects, see Chapter 16. For information about printing charts, see "Quick printing" on page 139. To save a chart, save the file containing the chart.

## What is a chart?

A **chart** is a visual representation of worksheet data. Charts reveal the significance of data and make it easier to identify trends and relationships. They're also dynamic; when you change the data a chart is based on, 1-2-3 updates the chart.

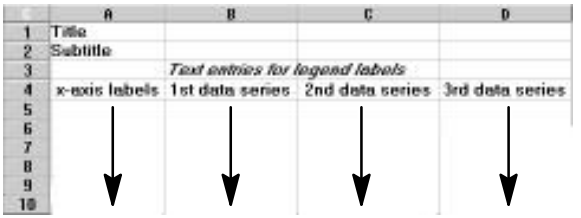



Most charts plot data against a horizontal x-axis and a vertical y-axis. The **x-axis** can include a scale or categories such as years, geographic areas, or age ranges. The **y-axis** can define the scale of values plotted in the chart. You can show units of measure, such as years or kilos, and title each axis to describe the categories or units plotted against it. You can also include labels for the chart title, subtitle, legend, and footnote.

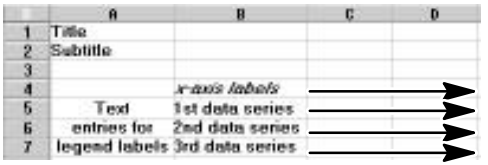
## Creating a chart

You can quickly create a chart from a selected range of data. When you create a chart, 1-2-3 plots each row or column of data in the selected range as a **data series**, a group of bars, lines, areas, or pie slices. A chart can contain up to 23 data series. 1-2-3 plots data series according to the following rules:

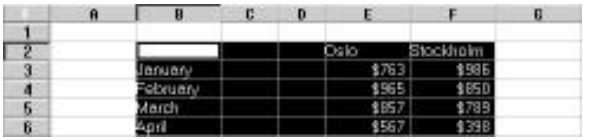
- If the selected range contains more rows of data than columns of data, 1-2-3 plots the data series by columns.




- If the selected range contains more columns of data than rows of data, or the same number of columns and rows of data, 1-2-3 plots the data series by rows.

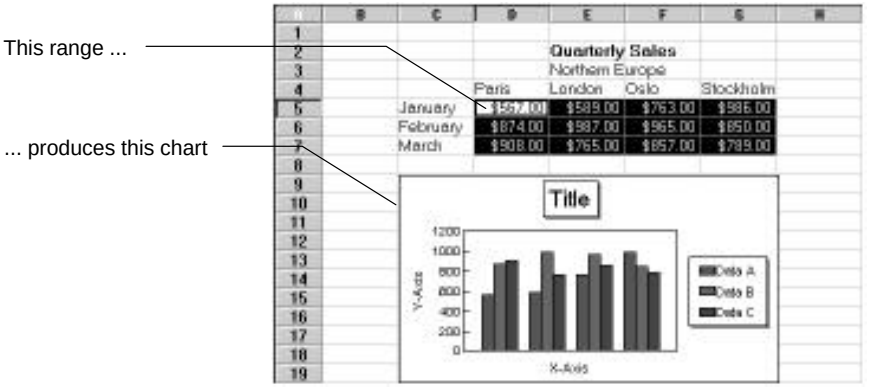



- 1-2-3 doesn't count blank columns or rows in the selected range. For example, 1-2-3 plots the data series shown below by columns, and counts the selection as having five rows and three columns.




**Help** You can use Chart Ranges to define data series that don't follow these rules. For information about how to define, delete, and change data series, search on "Data ranges" in Help.

If you select only numeric data and create a chart, 1-2-3 creates a default title, axis titles, and legend, as shown below.




If your selected range includes column and row headings, and text above or to the left of the numeric data, 1-2-3 uses the text to create the title, subtitle, axis labels, and legend, as shown below.

## To create a chart

When you create a chart, 1-2-3 uses the initial default chart type, a bar chart. You can change the default, as described on page 161.

1. Select the range or collection of data you want to chart.

   If you want, include text for the title, subtitle, axis labels, and legend.

2. Choose Tools Chart.

   In the worksheet, the mouse pointer changes to the one shown below.

*To cancel a chart while creating it, press* **ESC**.

3. Do one of the following:
   - To create the chart in the default size, click the worksheet where you want the top left corner of the chart to appear.
   - To size the chart yourself, drag across the worksheet and release the mouse button when the chart is the size you want.

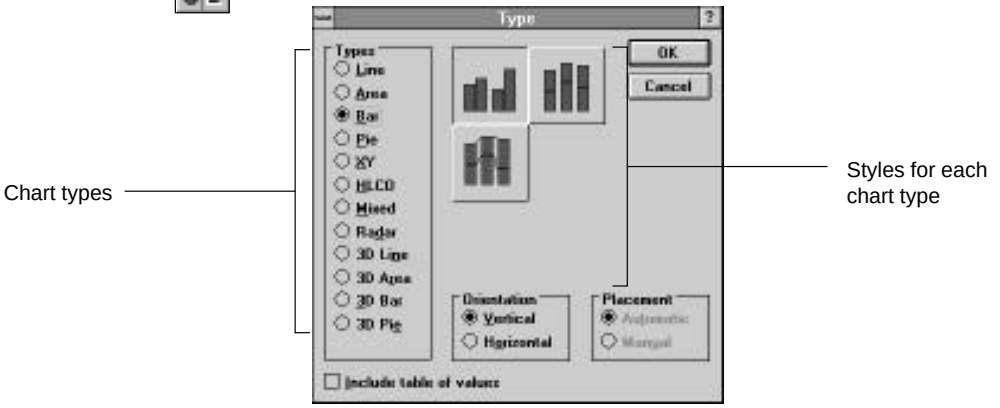
If the chart covers data, you can drag or size the chart when you want to see the data. To delete a chart, select it and choose Edit Cut or press **DEL**.

## Changing the chart type

1-2-3 provides many different types of charts, including 3D bar, line, area, and pie charts. After creating a chart, you can change it to the type you want. The type you choose depends on how you want to present your data. This section describes how to change from one type of chart to another and how to change the default chart type.

### To change chart type

1. Click the chart to select it.
2. Choose Chart Type.



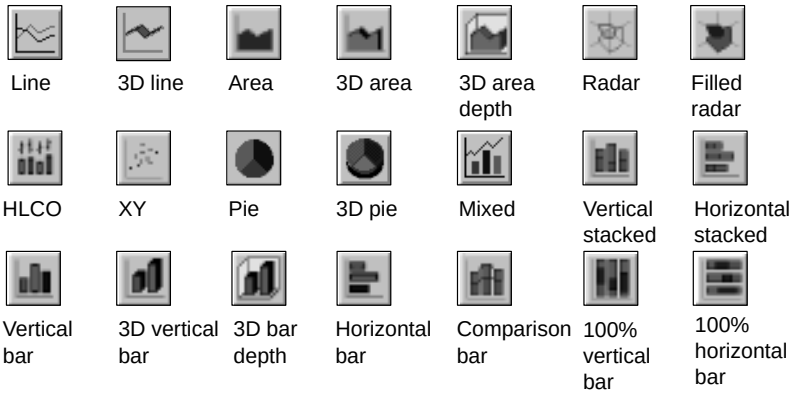
*You can also display your data in geographical maps. See page 170 for more information.*

3. Under Types, select a chart type.
4. Select one of the styles for the chart type.
5. Under Orientation, select an option.
   - Vertical displays the x-axis across the bottom of the chart.
   - Horizontal displays the x-axis along the left side of the chart.

   **Note** Orientation is not available for pie charts or radar charts.
6. If you previously moved the plot and want to return it to the default position, select Automatic under Placement.
7. To display data values under the chart, select the "Include table of values" check box.
8. Choose OK.

1-2-3 displays the chart as the new chart type.

**Shortcut** Select the chart and click one of the SmartIcons shown below to change the chart type. If the icon doesn't appear in your set of SmartIcons, you can use Tools SmartIcons to add it.




## To change the default chart type

1. Create a chart using Tools Chart.
2. Change the chart to the type you want as the default.
3. Choose Chart Set Preferred.

1-2-3 uses the chart type you selected as the default for new charts. To change an existing chart to the default type, select it and choose Chart Use Preferred.

## Types of charts

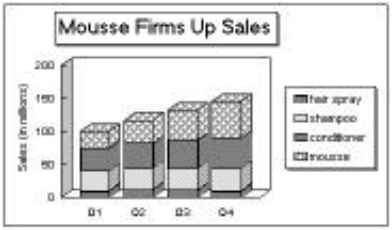
This section describes and illustrates all the different chart types. It also includes a table to help you choose the chart type that best presents your data.

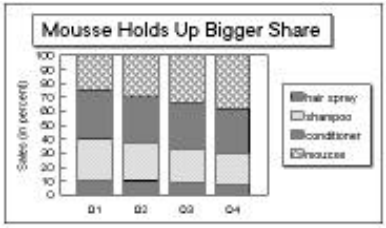
## Bar charts

Bar charts are the most common type of business chart. Each type of bar chart illustrates a specific relationship among the data in your worksheet. Bar charts work best when you have relatively few data elements.

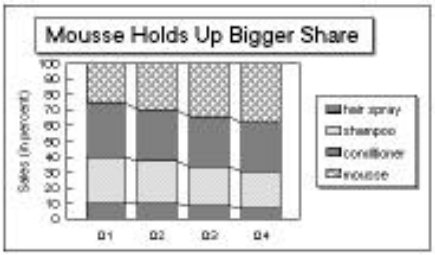
**Standard bar charts** emphasize individual values. The x-axis can show time progressing from left to right. The chart on the left below shows a set of sales data plotted for each year between 1989 and 1993. If you have more than one data range, 1-2-3 creates a clustered bar chart and displays each data range in a different pattern or color, as shown below on the right. Using clustered bars lets you compare several points in time.

Use a **stacked bar chart** when you want to compare totals in addition to individual values for each period. The bars in a stacked bar chart represent totals, and the segments in each bar represent the parts that comprise the total. For example, the charts below use the same data to show the total sales for each quarter, as well as the sales figures for each hair care product. The chart on the right shows the relative contributions of each product as a percent of sales.



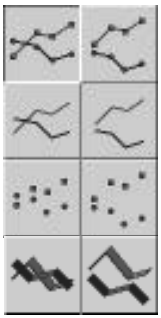



Use a **comparison bar chart** when you want a stacked bar chart that emphasizes the differences between corresponding segments in each bar.



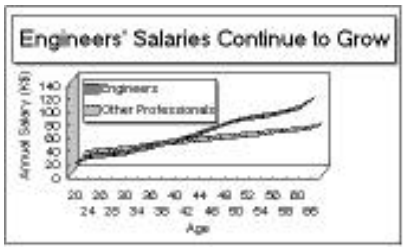

## Line and area charts

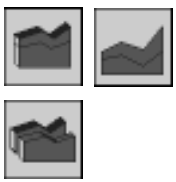
Line and area charts show the changes in a set of data over time. Like bar charts, line and area charts often show time progressing from left to right on the x-axis. These charts work especially well when you have many data elements.



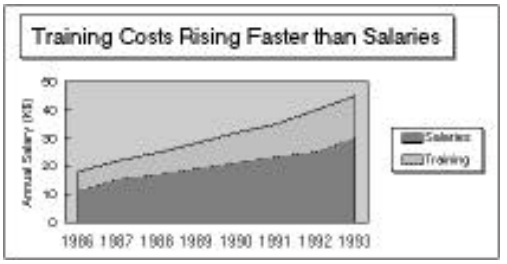
When you draw a **line chart**, 1-2-3 plots each element in a data series as a **data point** and connects the data points with a line. 1-2-3 can represent each data point with a symbol, such as a square or a triangle. You can change these symbols by selecting the line and choosing Style Lines & Color.

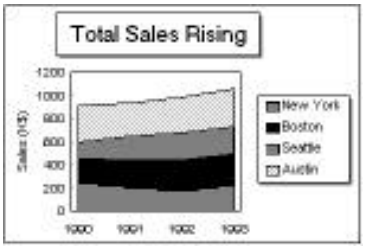
Using line charts, you can analyze actual values as well as compare the slope of lines to measure the rate of change. You can add visual interest to simple line charts by making them 3D.



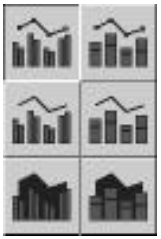



**Area charts** show trends in data over time by emphasizing the area under the curve created by each data series. Like line charts, area charts downplay individual values. The first area chart below reveals that training costs, although less than salary costs, are increasing faster than salaries. The second chart shows that total sales are improving, despite changes in individual sales offices.

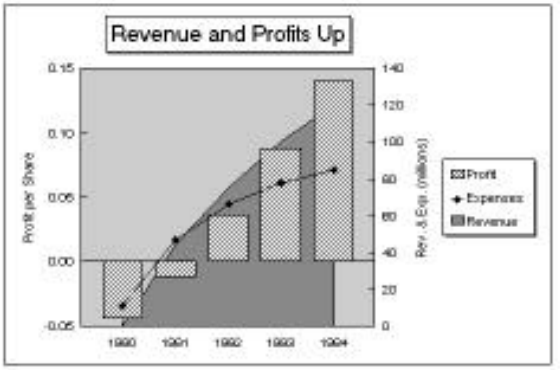



## Mixed charts

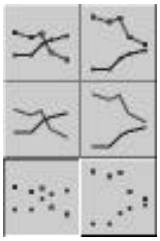


A **mixed chart** can combine parts from a line chart, a bar chart, or an area chart. This lets you plot data in two forms on the same chart. In the example below, the bars show that the company has moved from a loss to profitability over five years, the line shows the trend for expenses, and the area shows the total revenues. You can also create bar / area, and bar / line combinations.



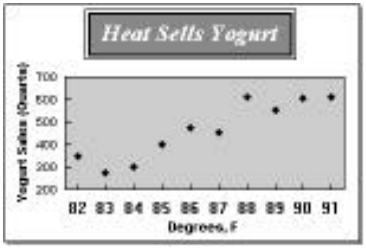

**Help** You can create your own mixed charts by using Chart Ranges to change the type of individual data ranges to line, area, or bar. For more information, search on "Data ranges" in Help.

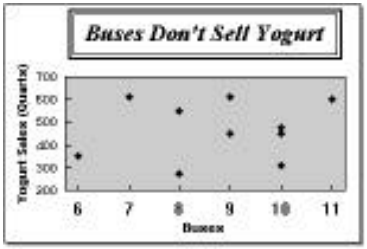
## XY charts



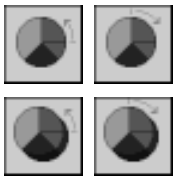
**XY charts** are similar to line charts, except that the data points are plotted against a numeric x-axis. An XY chart whose points are plotted without a connecting line is called a **scatter chart**.

You use an XY chart to see if there is a correlation between large sets of data. If the data points cluster around an imaginary line, then a correlation exists. The more points approach the "line," the stronger the correlation. The chart on the left below shows a correlation; the chart on the right shows no clear correlation.



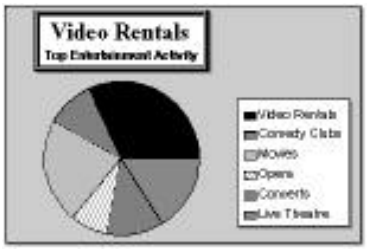



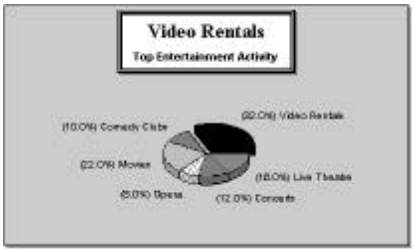

## Pie charts



**Pie charts** compare parts to the whole. 1-2-3 charts each data point or element as a slice in the pie. The size of a slice corresponds to the percentage of the data range it represents. You can include a legend that identifies each slice, or you can include labels that show the actual percentages or values that each slice represents.

You can also explode slices to set them apart from the rest of the pie. The data series can proceed in clockwise or counter-clockwise order. The charts below show the increasing popularity of video rentals, as compared to other kinds of entertainment.




## HLCO charts

**High-Low-Close-Open (HLCO) charts** are also called stock market charts. Use HLCO charts to track data that fluctuates over time, such as stocks, commodities, air temperature, and currency rates. HLCO charts show both ranges and data points.

A **whisker HLCO chart** consists of a set of vertical bars, with two markers on each bar. Each vertical bar shows the range of values between the first and second data series (the high and low values). The right marker shows the third data series (the ending or closing value) and the left marker shows the fourth data series (the starting or opening value).

The fifth data series is plotted as a bar chart below the HLCO chart, and represents trading volume in stock market charts. Any additional data series are plotted as lines in the HLCO portion of the chart.

The marker on the left shows the opening value

The top of each bar shows the high value

The bottom of each bar shows the low value

The marker on the right shows the closing value

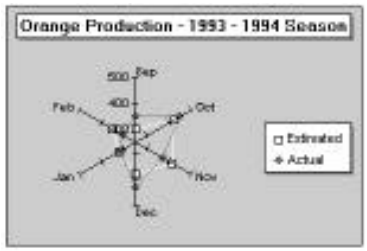
The bar chart shows volume

A **candlestick HLCO chart** provides the same information but shows the third and fourth data series (close and open) as a widened vertical bar spanning the range between close and open. The vertical bar is white if Close is higher than Open ("Advance"), and solid blue if Closed is lower than Open ("Decline"). The rest of the chart format is the same as the whisker HLCO.

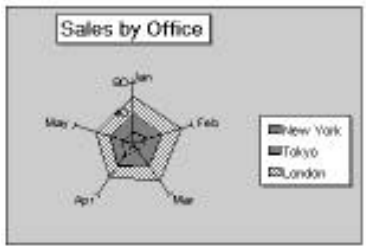
The widened vertical bar shows the range between open and close

## Radar charts

A **radar chart** is a line or area chart wrapped around a central point. Each axis represents a set of data points. Because they plot data as a function of distance from a central point, radar charts are useful for showing the symmetry or uniformity of data. For example, the line radar chart below shows the actual yield of Florida oranges over a 6-month period plotted against projected yields for these periods.




The area radar chart below shows sales results for each of three offices, along with the total sales for all three offices, over a five-month period.




## Choosing the best type of chart

When charting data, think about which chart type most clearly represents the data. The table below describes when it's best to use a particular chart type.

| *To show* | *Use this chart type* | *For example* |
|---|---|---|
| Items that change over time | Line, bar, mixed bar/line, stacked bar, area, HLCO | Annual sales from 1988–1994; 30-day stock trend |
| Items at a specific point in time | Horizontal bar, horizontal stacked bar | 1994 sales for 5 products; 1994 costs by month |
| Parts of the whole | Pie, 100% horizontal stacked bar, 100% area | Market share by company; percent of office space used in New York by industry |
| Frequency distributions | Bar | Number of homes in various price ranges; number of employees in various age ranges |
| Relationships between variables | Bar, scatter (XY) | Level of education compared to hours spent watching TV; average drop in asking price for home, versus length of time on market |
| Ranges of data | Bar, HLCO | Daily temperature ranges in February for Juneau, Alaska |
| Symmetry or uniformity of data | Radar | Individual performance versus group performance |

## Naming and finding charts

1-2-3 automatically assigns default names to all charts, starting with Chart 1. You can change the default name to a more descriptive one. This section describes how to rename a chart and how to find a chart by using the name. Going to a chart by name is particularly useful for finding charts in large files.

### To rename a chart

1. Select the chart.
2. Choose Chart Name.
3. Enter a name in the Chart name text box.

   You can't use the same name for more than one chart in the current file.
4. Choose Rename.

### To find a chart

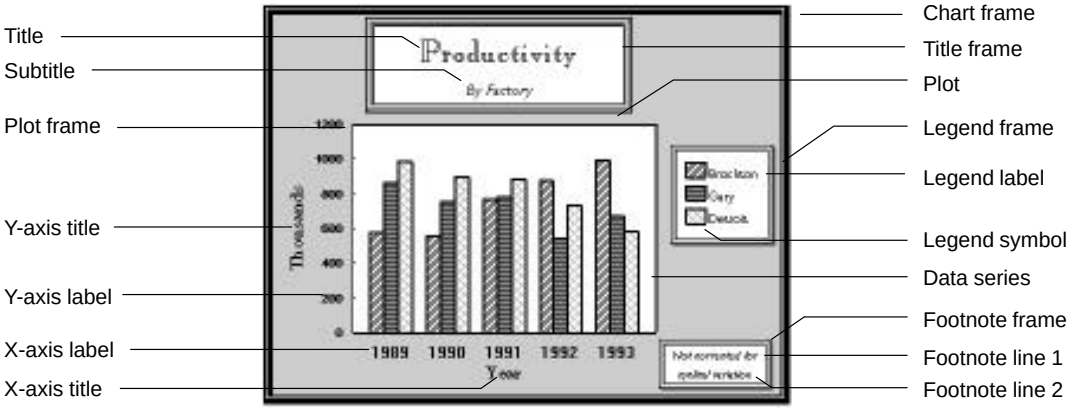
1. Choose Edit Go To.
2. From the Type of item drop-down box, select Chart.
3. If the chart is in another active file, select the file name from the In file drop-down box.
4. Select the name of the chart.

1-2-3 selects and displays the chart.

## Enhancing charts

You can customize a chart by working directly with its elements. For example, you can style, size, and move the title, footnotes, and legend. You can also change the axis scale and tick marks.

The illustration below shows the elements of a chart that you can work with and enhance.




**Help** For additional information, search on “Chart elements” in Help.

*To see the styling options available for a particular chart element, select it and press the right mouse button.*

You can style chart elements the same way you style other drawn objects. For example, you can use Style Lines & Color to add designer frames and interior colors and patterns to any framed chart element. For more information about working with drawn objects, see Chapter 16. You can also style text in a chart. For example, you can select the chart title and use Style Font & Attributes to change the font.

## Related Help topics

Tutorial lesson 4 gives you hands-on practice in creating and working with charts. To start the Tutorial, choose Help Tutorial.

You can add grid lines to a chart at major and minor intervals. For information, search on “Chart grid lines” in Help.

You can add labels for each data point in a data series. For more information, search on “Data labels” in Help.

You can specify a color and pattern for each point in a data series by using Chart Numeric Color and specifying a range. For example, you can highlight a specific bar in a bar chart by making it a different color from all the rest; or you can make the color of a particular bar dependent upon a variable, so the bar changes color when the variable exceeds a specified limit. For more information, search on "Colors" in Help and select the topic "Setting up a Colors or Patterns Range."

## What is a map?

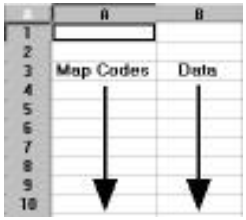
A **map** links worksheet data to a geographic map. For example, you can use a map to display sales information for each country in the world by linking the sales data in the worksheet to a map of the world.

Maps display data according to a set of predefined geographic regions, which depend on the type of map you use. The map groups the data into up to six categories, and shows each category with a separate color on the map.

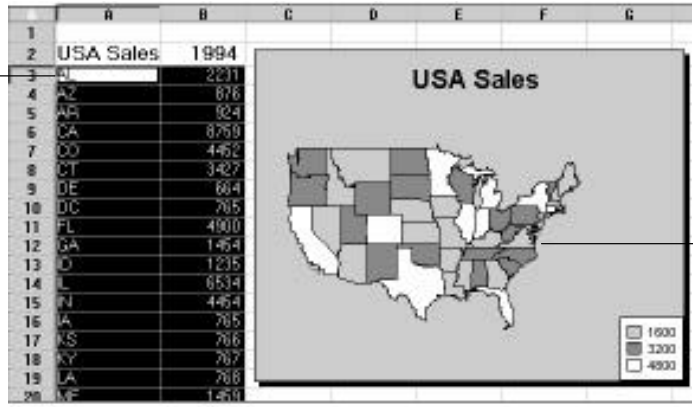
## Creating a map

You can quickly create a map from a selected range of data. When you set up the range, you must know the 2-character map code for each geographic region used in the map. For example, states in the United States have 2-character map codes that match mail abbreviations, such as MA for Massachusetts, OH for Ohio, CT for Connecticut, and so forth. Similarly, countries in Europe have pre-defined codes.

- The left column of the selected range contains the 2-character map codes for each location.
- The second column contains the data for each geographic region.




Use Tools Map Insert New Map to create a map from a selected map range.




**Help** For more information on creating and using a map, search on “Maps” in Help.

## Changing a map

You can change the colors used for each data group in a map. For example, you could display areas that lost revenue in red. You can also group geographic locations and display each location with a separate pattern. You can also include pin characters that flag specific locations on the map, such as an important city.

Pattern

Pin character

Pattern legend

To change map settings, use Tools Map Colors & Legend, Tools Map Patterns & Legend, and Tools Map Ranges & Title.

**Help** For more information on enhancing maps, search on "Maps" in Help.

# 16 Working with Graphics

You can use graphics to enhance your presentation of data in 1-2-3. This chapter tells you how to create, work with, and style drawn objects, such as lines, arrows, shapes, and text blocks.

## What are drawn objects?

**Drawn objects** are graphic elements you can use to enhance your worksheet data, as shown in the illustration below.

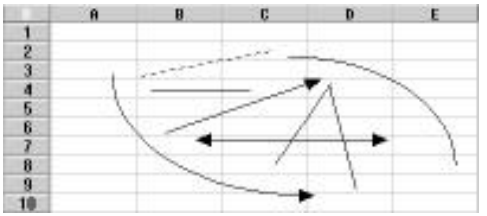
When you create and arrange drawn objects on a worksheet, they appear and print as part of the worksheet. In a multiple-sheet file, you can have different drawn objects on every worksheet.

You can create lines, arrows, shapes, and text blocks. The types of lines you can draw are plain lines, polylines, arcs, and freehand drawings. The shapes you can draw are rectangles, rounded rectangles, squares, polygons, ellipses, and circles. You can also copy a picture from another program to the Clipboard and paste it into a 1-2-3 worksheet.

Charts, chart elements, macro buttons, and embedded objects are also types of drawn objects. For information about creating and using charts, see Chapter 15. For information about creating and using macro buttons, see Chapter 24. For information about creating embedded objects, see Chapter 25.

## Creating lines, arcs, and arrows

You can use arrows to point out important data in your worksheet. You can use lines to create shapes such as triangles. As you draw a line, arc, or arrow you can drag it to any size or angle. When drawing an arc, drag in the direction you want the arc to curve. When you draw an arrow, the arrow head appears at the end where you stop dragging.



### To create a line, arc, or arrow

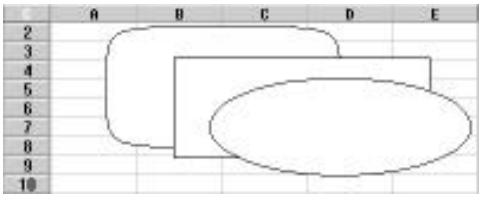
*For horizontal, vertical, or 45-degree lines or arrows, hold down* **SHIFT** *as you drag.*

1. Choose Tools Draw Line, Tools Draw Arc, or Tools Draw Arrow.
2. Move the mouse pointer where you want to begin drawing the line, arc, or arrow.
3. Drag across the worksheet to where you want to end the line, arc, or arrow.
4. Release the mouse button.

**Shortcut** You can use the SmartIcons shown at left in place of step 1 to create lines, arcs, and arrows.

## Creating rectangles and ellipses

You can use rectangles, rounded rectangles, and ellipses to surround areas of your worksheet, or to create designs such as logos.



### To create a rectangle or ellipse

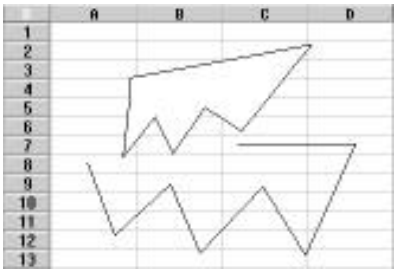
*To draw a square instead of a rectangle or a circle instead of an ellipse, hold down* **SHIFT** *as you drag.*

1. Choose Tools Draw Rectangle, Tools Draw Rounded Rectangle, or Tools Draw Ellipse.
2. Move the mouse pointer where you want to begin drawing the shape.
3. Drag across the worksheet where you want the shape to appear.
4. Release the mouse button.

**Shortcut** You can use the SmartIcons shown at left to create a rectangle, rounded rectangle, or an ellipse.

## Creating polylines and polygons

A **polyline** is an open shape consisting of straight or freehand line segments. A **polygon** is a closed shape with any number of straight or freehand line segments as sides. A polyline or polygon can be a combination of straight and freehand line segments.




### To create a polyline or polygon

*For horizontal, vertical, or 45-degree lines, hold down* **SHIFT** *as you drag.*

1. Choose Tools Draw Polyline or Tools Draw Polygon.
2. Move the mouse pointer where you want to begin drawing the first line segment.
3. To draw a straight line segment, drag across the worksheet to where you want to end the line. To draw a freehand line segment, hold down **CTRL** while dragging.
4. Release the mouse button.
5. Drag or **CTRL**+drag to draw each line segment.
6. Double-click to complete the polyline or polygon.

You don't have to draw the last line segment in a polygon; 1-2-3 automatically connects the last line segment you drew to the first.

**Shortcut** You can use the SmartIcons at left in place of step 1 to create a polygon or polyline.

## Drawing freehand

You can draw freehand on the worksheet to create any shapes you want.

### To draw freehand

1. Choose Tools Draw Freehand.
2. Move the mouse pointer where you want to begin the freehand drawing.
3. Drag across the worksheet.
4. Release the mouse button where you want the drawing to end.

## Using text blocks

Text blocks are like notes you stick on a page to add comments or emphasize important information. You can size the text block and place it anywhere on the worksheet. You can edit text in a text block and style it.

### To create a text block

1. Choose Tools Draw Text.
2. Move the mouse pointer where you want to begin the text block.
3. Do one of the following:
   - Click to create the text block in the default size.
   - Drag across the worksheet and release the mouse button when the text block is the size you want.

   1-2-3 displays the text block with the insertion point, a blinking vertical bar, in the top left corner.
4. Enter text by typing or by pressing **SHIFT+INS** to paste it in.

   For example, you can copy text from a cell to the Clipboard and press **SHIFT+INS** to paste it into the text block.
5. When you finish entering text, click the worksheet.

### To edit text in a text block

1. Select the text block.
2. Double-click the text block to start editing.
3. Edit the text.
4. When you finish editing, click the worksheet.

### To change the appearance of a text block

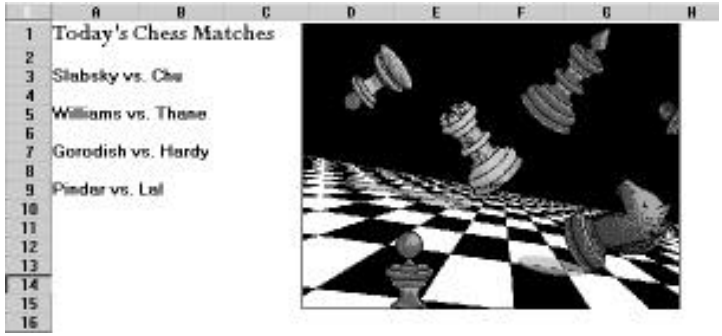
*To quickly access font, attributes, line, and color options for the current selection, click the right mouse button.*

1. Select the text block.
2. Do one of the following:
   - To change the type face, size, color, or attributes of the text in the text block, choose Style Font & Attributes.
   - To change the alignment, choose Style Alignment.
   - To apply edge styles, colors, and designer frames to the text block, choose Style Lines & Color.

   **Note** You can't apply different fonts, attributes, and colors to different parts of the text in a text block. You can apply only one font, attribute, and color to all the text. For more information about applying styles, see Chapter 12.

## Bringing pictures into 1-2-3

You can bring a picture from another program into 1-2-3. For example, you can create or edit a picture in Windows Paintbrush, copy it to the Clipboard, and paste it into your 1-2-3 worksheet.




### To bring a picture into 1-2-3

1. Make sure the Clipboard contains a copy of the picture.
2. Click the worksheet where you want to place the top left corner of the picture.
3. Choose Edit Paste.

The picture appears on the worksheet. You can select, size, move, style, and delete it like any other drawn object.

## Working with drawn objects

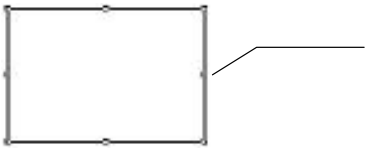
You can select, copy, move, size, style, and delete drawn objects. Working with a drawn object doesn't affect the worksheet area behind the object. For example, if you move or size an object, it doesn't move or size the worksheet cells behind the object. Moving or sizing the cells behind a drawn object can affect the object, depending on how the object is fastened to the cells. For more information about fastening drawn objects to cells, see page 181.

### To select drawn objects

*To select more than one drawn object, click the first one and then* **SHIFT+** *click or* **CTRL+** *click the others; or lasso the objects.*

1. Move the mouse pointer over the drawn object you want to select.
2. Click the object.

   Small squares called **handles** appear at the corners, mid-points, and ends of the object. You can use these handles to size the object.



**Note** You can't select a macro button by clicking it with the left mouse button. You can use the lasso icon shown at left to select a macro button or any other drawn objects. You can also select a macro button by **SHIFT**+clicking it, **CTRL**+clicking it, or pointing to it and clicking the right mouse button. Clicking the right mouse button selects the button and brings up the right mouse menu.

### To copy drawn objects

You can copy drawn objects within the current worksheet, between other worksheets or files, and to other applications. You can copy drawn objects using the Clipboard, as described in this section, or by dragging with the mouse.

*To copy a selected drawn object in the current worksheet, press* **INS**.

1. Select one or more drawn objects.
2. Choose Edit Copy.
3. Select a cell where you want to paste the object.
4. Choose Edit Paste.

**Help** To find out how to copy drawn objects by dragging, search on "Copying drawn objects" in Help.

## To move drawn objects in the current worksheet

1. Select one or more drawn objects.

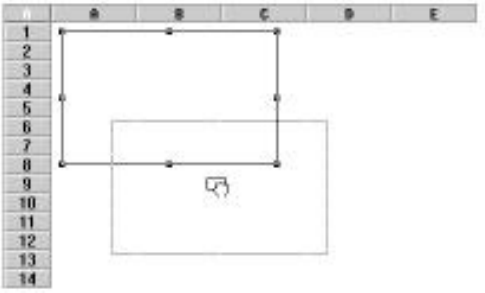
   To move more than one drawn object, position the mouse pointer over any one of the selected objects.
2. Drag the object by any part except the handles.

   To move the object to a part of the worksheet that is not visible, move the mouse pointer to the edge of the worksheet to scroll through the worksheet.

*To cancel the move, press* **ESC** *before you release the mouse button.*

3. Release the mouse button when the object is where you want it.

As you drag a drawn object, an outline of the object appears, and the mouse pointer changes as shown below.



## To move drawn objects to another worksheet or file

1. Select one or more drawn objects.
2. Choose Edit Cut.
3. Select a cell in the worksheet where you want to paste the object.
4. Choose Edit Paste.

**Help** To find out more about moving drawn objects by dragging, search on "Moving drawn objects" in Help.

## To size drawn objects

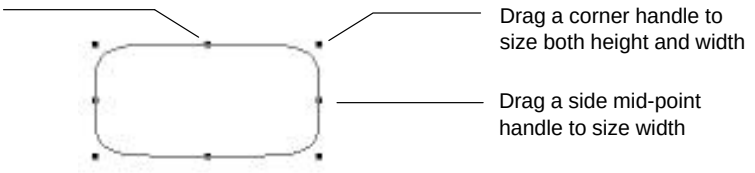
*To cancel sizing, press* **ESC** *before you release the mouse button. If you don't like the results after sizing, press* **CTRL+Z** *or choose Edit Undo to restore the object to its original size.*

You can change the size of any drawn object. You can change width, height, or both for all objects other than lines or arrows.

1. Select one or more drawn objects.
2. Drag a handle in the direction you want to size the object.

   When you select multiple drawn objects, you can size them all by dragging a handle of one object.

   To maintain the proportions of a drawn object, hold down **SHIFT** and drag a corner handle in the direction you want to size the object.




3. Release the mouse button when the object is the size you want.

## To delete drawn objects

1. Select one or more drawn objects.
2. Choose Edit Clear or press **DEL**.

   **Note** When you delete a drawn object with Edit Clear or **DEL**, 1-2-3 doesn't put the object on the Clipboard. Choose Edit Cut when you want to delete a drawn object and put it on the Clipboard.

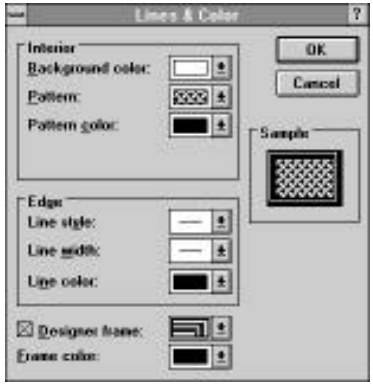
## Enhancing drawn objects

You can enhance drawn objects with a variety of visual effects. You can change lines and edges, add designer frames, and change patterns and colors. You can also shuffle drawn objects, flip them, rotate them, group them, lock them, and fasten them to underlying cells.

## To change lines, edges, patterns, colors, or designer frames

*Double-click a drawn object to display the Lines & Color dialog box for styling the object.*

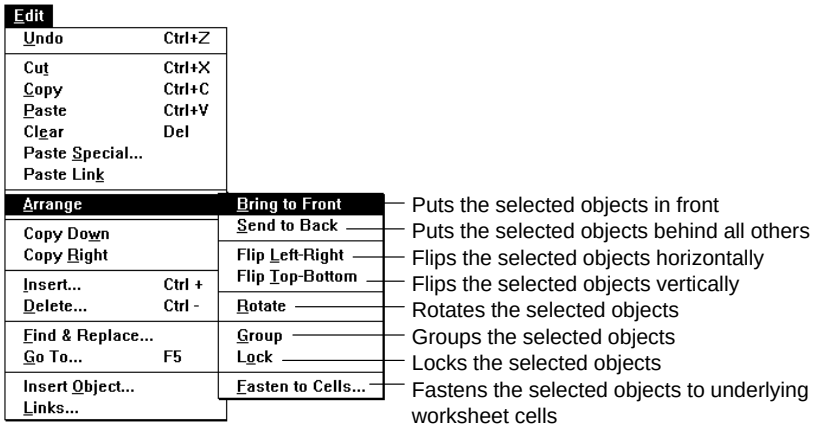
1. Select one or more drawn objects.
2. Choose Style Lines & Color.




3. Select the options you would like to change.
4. Choose OK.

## To arrange drawn objects

You can use the Edit Arrange commands to shuffle overlapping drawn objects, flip or rotate objects, group objects so you can work with them as a unit, and lock objects to prevent accidental change. You can also fasten objects to the worksheet cells behind them so you can move or resize cells and objects together.




**Help** For more information, search on “Arranging drawn objects” in Help.

# 17 Using Version Manager

You can use Version Manager to perform advanced what-if analysis. For example, you can create and test financial scenarios, or analyze business assumptions to discover financial possibilities. You can use Version Manager by yourself, or you can share files and create versions and scenarios in a workgroup. This chapter describes how to use Version Manager to create and share versions and scenarios.

## What are versions?

**Versions** are sets of different data for the same named range. Each version has a name, a date and time stamp, the name of the person who created or modified the version, and optional styles and comment. You use Version Manager to create and manage versions.

For example, suppose you enter the values 520, 435, 315, and 225 in the range A:B2..A:E2. You then use Version Manager to name this range Income and to create a version called High Income, as shown below.

High Income version

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | Income | 520 | 435 | 315 | 225 | |

You then enter the values 440, 360, 220, and 125 in Income and create a second version named Level Income, as shown below.

Level Income version

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | Income | 440 | 360 | 220 | 125 | |

Finally, you create a third version using the values of 315, 270, 165, and 78 named Low Income.

Low Income version

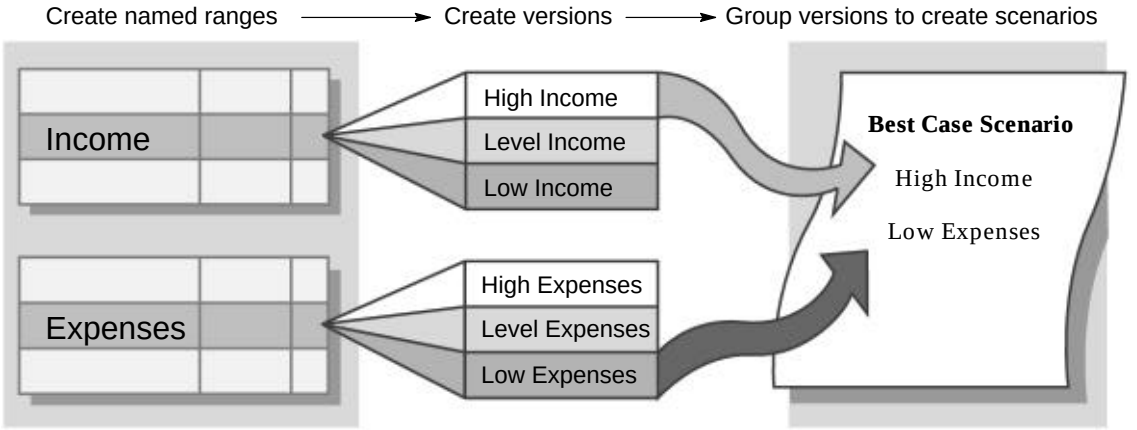
| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | Income | 315 | 270 | 165 | 78 | |

1-2-3 saves all three versions of Income along with other information including your name as creator of the version, the date and time you created the version and, optionally, any styles you applied to the version's range, and a comment.

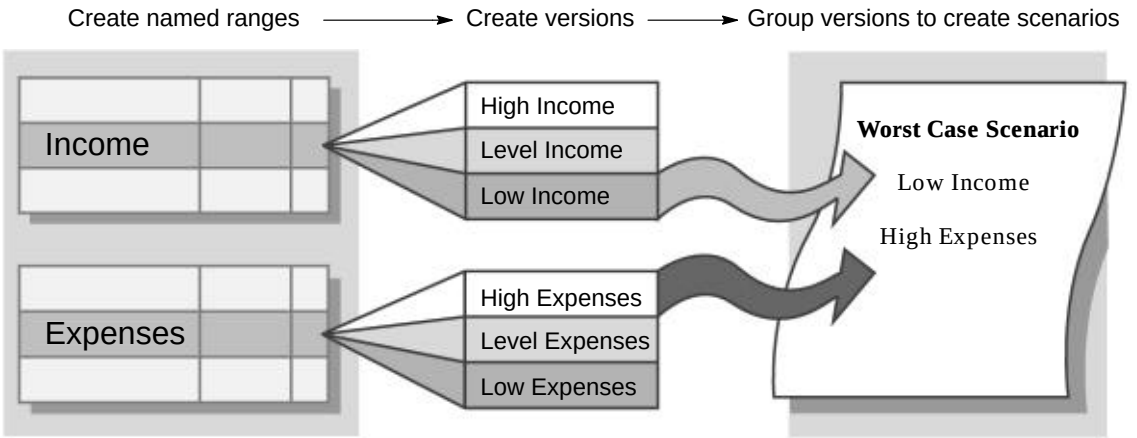
You can create versions of any named range in a file. For example, as well as creating versions of Income, you can name another range Expenses and create versions named High Expenses, Level Expenses, and Low Expenses.

## What are scenarios?

A **scenario** is a named group of versions. For example, you can create scenarios by grouping different versions of the ranges Income and Expenses. You can group the High Income version of Income with the Low Expenses version of Expenses to create a scenario named Best Case.




You can also create a scenario named Worst Case by grouping the Low Income version of Income with the High Expenses version of Expenses, as shown below.



## Working with Version Manager

When you choose Range Version, 1-2-3 displays the Version Manager window, containing the Version Manager or the Version Manager Index. You use the Manager and Index to create versions and scenarios for the current file. You can move back and forth between the Manager, the Index, and the worksheet.

You use the **Manager** to work with one version at a time. You can use the Manager to create, delete, and update versions; display a version in the worksheet; and change version information, such as a version comment.

**Help** For information about the function of each Manager button, search on "Versions" in Help and choose the topic "Range Version Manager." The Help topic contains a picture of the Manager. To pop up a description of any Manager button, point to the button in the picture and click it.

You use the **Index** to work with more than one version or scenario at a time and track changes. For example, you can use it to group versions into a scenario and to modify a scenario. You can also use the Index, like the Manager, to work with one version at a time.

Using the Index, you can see information about many versions simultaneously; sort the versions by range name, version name, scenario name, date, or creator; and create or modify a scenario by grouping versions.

**Help** For information about the function of each Index button, search on "Scenarios" in Help and select the topic "Range Version Manager Index." The Help topic contains a picture of the Index. To pop up a description of any Index button, point to the button in the picture and click it.

You can leave the Version Manager window open while you work, shrink it to an icon, move it, size it, and maximize it. Increasing the size of the window vertically when you're working with the Manager is a way to display comments about versions.

### To move between the worksheet, Manager, and Index

You often move back and forth between the worksheet, the Manager, and the Index. For example, you can enter data in a range, then use the Manager to name the range and create a version. Next you can move back to the worksheet to enter new data in the range and return to the Manager to create a new version. Then you can switch from the Manager to the Index and group one of these versions with versions of other named ranges to create a scenario.

1. To move back and forth between the Manager and Index, choose To Index or To Manager, or press **ALT+T**.
2. To move back and forth between the Version Manager window and the worksheet, click the worksheet, click the Version Manager window, or press **ALT+F6**.

## Using versions

You can use Version Manager to create, delete, and update versions. You can also change information saved with a version, such as a comment, and you can display different versions of named ranges in the worksheet.

### To create a version

You can create versions of a range only if it is named. You can use Version Manager to name a range and create versions of that range. You can also use Version Manager to create versions of ranges you previously named using the Range Name command. For rules about naming ranges and information about using Range Name, see Chapter 9.

1. Enter data for the version into the range.
2. If you already named the range, make sure the cell pointer is in the range. If the range is unnamed, select the entire range.

3. Choose Range Version.
4. Choose Create.

5. If you haven't already named the range, you can accept the default range name or enter a different name in the Range name text box.
6. Accept the default version name or enter a name in the Version name text box.
7. To add a comment about the version, enter it in the Comment text box.
8. Under Sharing options, select an option: Unprotected, Protected, or Protected & hidden. Unprotected is the default.
9. To save any styles you applied to the version, select the Retain styles check box.

   **Note** When you share a file on a Lotus Notes server, the file is sealed. If you protect a version, you can't unprotect it unless you know the password for unsealing the file and have access to the Notes server.
10. Choose OK.

## To display a version in the worksheet

1. Choose Range Version.
2. In the Manager, in the Named range drop-down box, select the range for which you want to display a version.
3. Select the version from the "With version(s)" drop-down box.

   1-2-3 displays the selected version in the worksheet, or displays the Show Version dialog box if displaying the selected version would write over unsaved data.

You can also display a version in the worksheet by double-clicking it in the Index.

## To display more than one version

If you created versions for several named ranges, you can select a version for each range and display these versions in the worksheet.

1. Choose Range Version.
2. In the Index, hold down **CTRL** and click the versions you want to display in the worksheet.
3. Choose Show.

   1-2-3 displays the selected versions in the worksheet, or displays the Show Version dialog box if displaying the selected versions would write over unsaved data.

## To modify the version settings

You can change the comment, the style setting, and the sharing setting for a version. You can also rename the range.

1. Choose Range Version.
2. In the Manager, select the version from the "With version(s)" drop-down box; or in the Index, select the version from the list.

   If the version you want to modify is hidden, you must use the Index. Select "Hidden only" from the Shown drop-down box, then select the version you want to modify.
3. Choose Info.

4. To rename the range, enter a new name in the Range name text box.
5. To modify the comment, edit it in the Comment text box.
6. To save the range's styles with the version when you update the version data, select the Retain styles check box.

   If the version is displayed in the worksheet and does not contain unsaved data, 1-2-3 updates the styles for the version when you choose OK. Otherwise, the next time you update this version, 1-2-3 updates the styles as well as the data for the version.

7. To modify the sharing setting, select a sharing option: Unprotected, Protected, or Protected & hidden.

   **Note** When you share a file on a Lotus Notes server, the file is sealed. If you protect a version, you can't unprotect it unless you know the password for unsealing the file.

8. Choose OK.

## To update a version

Any time you modify the data or styles in a version, you must update the version if you want to save your changes.

Until you update a modified version, it appears in italics with a line through the check mark

1. Choose Range Version.
2. In the Manager, select the version from the "With version(s)" drop-down box.
3. In the worksheet, enter the new data and styles for the version.
4. In the Manager, choose Update.

   1-2-3 asks you to confirm the update.

5. Choose OK.

*You can use the Index to update more than one version at a time.*

**Help** For information about how to modify a protected version or a protected and hidden version, search on "Modifying versions" in Help and select the topic "Version Info."

## To delete a version

1. Choose Range Version.
2. In the Manager, select the version from the "With version(s)" drop-down box; or in the Index, select one or more versions.

   **Note** You can only delete unprotected versions. To delete a protected version, select the version, choose Info, and change the sharing option to Unprotected.

3. Choose Delete.

   1-2-3 asks you to confirm the deletion.

4. Choose OK.

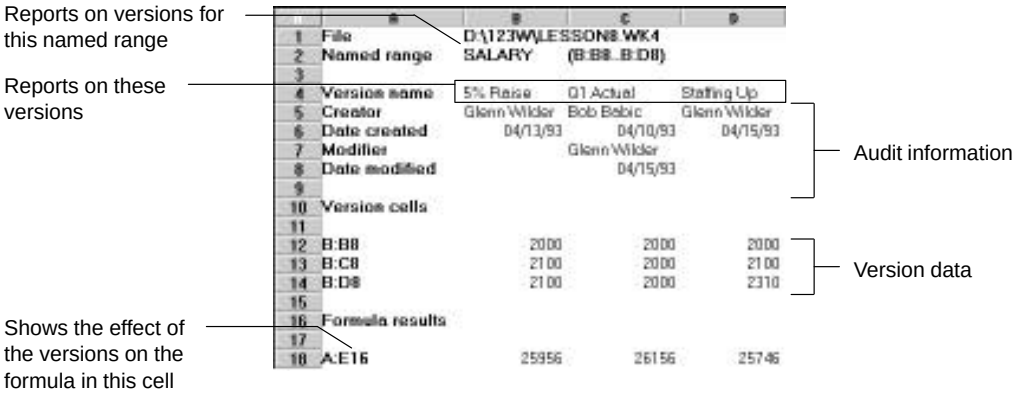
## To create a version report

You can create reports about versions. A report can list the versions for a single named range. It can also show the version data, the effect of selected versions on formulas in the worksheet, and audit information, such as who last modified a version.

1. Choose Range Version.
2. In the Index, choose Report.

3. In the "Report on named range" drop-down box, select a range.
4. In the Versions list box, select the version or versions you want 1-2-3 to report on.
5. To see how the selected versions affect the results of formulas in the worksheet, specify the address or name of the range containing the formulas in the "Include results for formulas from this range" text box.
6. To include the data for the selected versions, select the Version data check box.
7. To include the names of users who created and last modified the version, with the date and time the version was created or last modified, select the Audit information check box.
8. Under Arrange data, select By columns or By rows.
9. Choose OK.

1-2-3 creates the report in a new file and gives the file a unique name beginning with REPORT; for example, REPORT03.WK4, as shown below. You can print and save a version report just like any other file.




## To sort versions

In the Index, you can sort versions so that you see only the versions you want to work with. Often, you sort versions before grouping them to create a scenario. Sorting also helps you track changes to versions and scenarios.

You can sort versions by range name, version name, creator or modifier, and date created or modified. You can also sort by scenario to see which versions comprise a scenario.

1. Choose Range Version.
2. In the Index, select a sorting option from the Sort drop-down box.

The illustration below shows versions sorted by range name.

The next illustration shows versions sorted by date created.

Versions sorted by date

## Using scenarios

You can group selected versions for different named ranges to create scenarios. This section describes how to create, display, modify, and delete scenarios.

### To create a scenario

1. Choose Range Version.
2. In the Index, hold down **CTRL** and click the versions you want to group into a scenario.

   Select only one version from each range. The version name appears in the Selected versions list box.
3. Choose Scenario.

4. Accept the default scenario name or enter a different name in the Scenario name text box.
5. To add a comment about the scenario, enter it in the Comment text box.

6. Under Sharing options, select an option: Unprotected, Protected, or Protected & hidden.

   **Note** When you share a file on a Lotus Notes server, the file is sealed. If you protect a version, you can't unprotect it unless you know the password for unsealing the file.

7. To add a version to the scenario, select the version in the Available versions list box, and choose << or double-click the version.
8. To remove a version from the scenario, select the version in the Selected versions list box, and choose >> or double-click the version.

   1-2-3 removes the version name from the Selected versions list box.

9. Choose OK.

1-2-3 creates a scenario with the name you specified, comprised of the versions you grouped. The Index displays your new scenario with any other scenarios, sorted by name.

## To display a scenario

*To display one scenario in the worksheet, double-click it.*

1. Choose Range Version.
2. Select Scenario name from the Sort drop-down box.
3. Select the scenario you want to display in the worksheet.
4. Choose Show.

   1-2-3 displays the selected scenario in the worksheet, or displays the Show Scenario dialog box if displaying the selected scenario would write over unsaved data.

## To modify a scenario

You can change the group of versions that comprise a scenario. You can also modify the comment and the sharing setting.

1. Choose Range Version.
2. In the Index, select Scenario name from the Sort drop-down box.

   If the scenario you want to modify is hidden, select "Hidden only" from the Shown drop-down box.

3. Select the scenario.
4. Choose Info.

*You can modify the sharing options for more than one scenario at a time. Select the scenarios and choose Info.*

5. To modify the comment, edit it in the Comment text box.
6. To add a version to the scenario, select the version in the Available versions list box, and choose << or double-click the version.

   The version name appears in the Selected versions list box.
7. To remove a version from the scenario, select the version in the Selected versions list box, and choose >> or double-click the version.

   1-2-3 removes the version name from the Selected versions list box.
8. To modify the sharing setting, select a sharing option: Unprotected, Protected, or Protected & hidden.
9. Choose OK.

**Help** For information about how to modify a protected scenario or a protected and hidden scenario, search on "Modifying scenarios" in Help and select the topic "Scenario Info."

## To delete a scenario

1. Choose Range Version.
2. In the Index, select Scenario name from the Sort drop-down box.
3. Select one or more scenarios.
4. Choose Delete.

   1-2-3 asks you to confirm the deletion.
5. Choose OK.

**Note** When you delete a scenario, you delete a grouping of versions, not the versions themselves.

## Sharing versions and scenarios

You can share versions and scenarios in a workgroup. For example, you can share an income statement projection worksheet with your co-workers, letting them enter their projections for income and expenses as versions of named ranges. Then you can group different versions to create scenarios. You can share files containing versions and scenarios in three ways: using Lotus Notes, using a network, and without a network.

### Sharing files using Lotus Notes

To share files using Lotus Notes, you create a **shared file** — a sealed 1-2-3 file saved on a Notes server. Then everyone in the workgroup can create, delete, modify and display versions and scenarios in the shared file. Workgroup members can simultaneously work with versions and scenarios without writing over each other's work. You can use Lotus Notes to replicate shared files among Notes servers.

#### To create a shared file

1. Open the file you want to share.
2. Use Version Manager to create named ranges and give each at least one version.

   A named range must already have at least one version in order for workgroup members to be able to create versions.
3. Use Style Protection to allow changes to cell contents in the named ranges.

   For information about unprotecting ranges, see "To seal a file and leave specified ranges unprotected" on page 154.
4. Choose File Save As.
5. Select the shared file type, .NS4, in the File type drop-down box.
6. In the Notes servers drop-down box, select the name of a Notes server accessible to everyone you want to share the file with, and, if necessary, select the directory in the Directory list box.You must have access rights to the server to place a file on it.

   If you want to test the file before putting it on the Notes server, you can select your local Notes directory in the Notes servers drop-down box. Then, after you finish testing, you can copy it to the Notes server.
7. Enter a file name in the File name text box, and choose OK.

   1-2-3 displays the Set Password dialog box.

8. In the Password text box, enter a password to seal the shared file.

   A password can include 15 characters or less. 1-2-3 displays an * (asterisk) for each character as you enter the password. 1-2-3 is case-sensitive for passwords, so you must remember the exact combination of uppercase or lowercase letters you use when you create the password.

9. In the Verify text box, enter the same password, and choose OK.

1-2-3 saves the file as a shared file with the extension .NS4 and seals the file with the password you entered, protecting all cells except the ranges you marked as unprotected.

### To use a shared file

1. Choose File Open.
2. Select the shared file type, .NS4, from the File type drop-down box.
3. Select the name of a Notes server from the Notes servers drop-down box.
4. Select the file name in the File name list box.
5. Choose OK.
6. Use Version Manager to create, modify, delete, or display versions and scenarios in the shared file.

   **Note** You can create and display versions of unprotected named ranges only.

7. Choose File Save Versions to save the new versions and scenarios you created.

If another user creates versions or scenarios in a shared file and saves the file while you're using it, 1-2-3 beeps and displays the message "New versions have been posted" in the title bar. To display newly created versions or scenarios, refresh the file.

### To refresh a shared file

1. Choose Range Version.
2. In the Index, choose the Refresh button, shown at left.

1-2-3 makes available all newly created versions and scenarios. A dot appears next to all newly created versions and scenarios until you display them in the worksheet or choose the Mark All Unread button, shown at left.

If a version is unprotected, anyone can update it with new information. To ensure that a version remains with the initial data, the sharing options should be set to protected.

**Note** The Refresh button appears only if Lotus Notes is installed on your computer. Refresh is dimmed when the shared file has no new versions or scenarios or when the current file isn't a shared file.

## Sharing files using a network

To share files using a network, you create a file on a network file server that all members of your workgroup can access. Your co-workers can create, modify, delete and display versions and scenarios in the file. You can save changes to a file shared over a network only if you have the file reservation.

### To share a file on a network file server

1. Open the file you want to share.
2. Use Range Name to name the ranges for which you want your co-workers to create versions.
3. To unprotect the named ranges, use Style Protection.

   For information, see "To seal a file and leave specified ranges unprotected" on page 154.
4. To seal the file with a password, use File Protect.

   Sealing a file prevents changes to the file except in the unprotected ranges. For more information, see "Sealing a file" on page 153.
5. Choose File Save As.
6. Select a network file server from the Drives drop-down box.
7. Enter a file name in the File name text box.
8. Choose OK.

### To use a file shared on a file server

1. Choose File Open.
2. In the Drives drop-down box, select the network file server where the file is stored.
3. Select the file name in the File name list box.

4. Choose OK.

   If another user has the file reservation, 1-2-3 displays a message, and you can't save changes to the file. You can open the file for reading only, and you can try to get the reservation later.

   To save changes to the file, you can also use File Save As to save the file with a different name. Later when the file reservation is available, you can merge your versions and scenarios into the shared file. For information about merging versions and scenarios, see page 199.

5. Use Version Manager to create, modify, delete, or display versions and scenarios in the shared file.

   **Note** You can create versions of unprotected named ranges only.

6. Choose File Save to save the new versions and scenarios you created.

**Help** For more information about file reservations, search on "Reservation" in Help.

## Sharing files without a network

To share files without a network, create a file and send copies of it to everyone in your workgroup. You can maintain a master copy of the file; your co-workers enter versions and scenarios in their own separate copies of the file. After they return their copies, you can merge everyone's versions and scenarios into the master copy of the file.

**Note** When you merge versions and scenarios, make sure the **destination file**, the one you're copying to, contains ranges with the same names and dimensions as the named ranges in the **source file**, the one you're copying from. 1-2-3 copies the new versions from the source file into the destination file.

### To share a file without a network

1. Open the file you want to share.
2. Use Range Name to name the ranges for which you want your co-workers to create versions.
3. Use Style Protection to unprotect the named ranges.

   For information, see "To seal a file and leave specified ranges unprotected" on page 154.

4. Use File Protect to seal the file with a password.

   Sealing a file prevents changes to the file except in the unprotected ranges. For more information, see “Sealing a file” on page 153.

5. Use File Save As to save the file.

### To merge versions and scenarios

*To display a list of merged versions, save the destination file immediately before merging. Then merge the files, and in the Index, select New only from the Shown drop-down box.*

1. Make sure the source file and the destination file are both active.
2. Make the destination file the current file.
3. Choose Range Version.
4. In the Index, choose Merge.

5. In the “From file” drop-down box, select the name of the source file.
6. To merge only versions and scenarios created on or after a particular date, enter the date in the “Modified on or after date” text box.

   Enter the date in day-month-year, day-month, or long international format.

7. To merge only versions and scenarios created or last modified by a particular user, select the user’s name in the “Last modified by” drop-down box.
8. Choose OK.

1-2-3 displays a message with the results of the merge. For a detailed explanation of this message, press **F1 (HELP)** or click the ? button in the message box. After you merge the new versions into your master copy, you can again share copies of the file with everyone in the workgroup.

## Related Help topics

For information about Version Manager @functions, search on "Information @Functions." For information about Version Manager macros, search on "Version Manager macro commands."

Tutorial lesson 8 gives you hands-on practice creating versions and scenarios. Choose Help Tutorial to start the Tutorial.

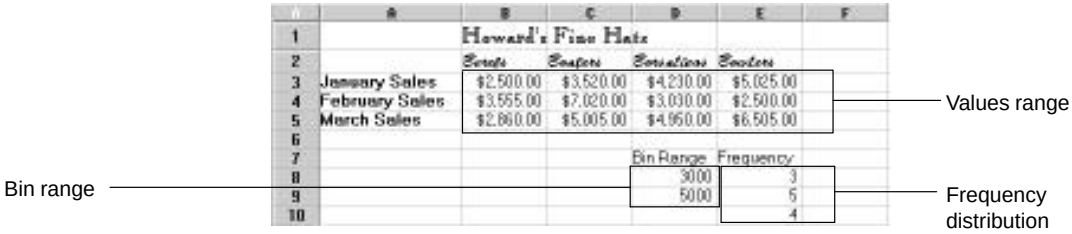
# 18 Performing Statistical Analysis

A 1-2-3 worksheet is useful not only for tracking day-to-day activities, but also for analyzing statistics over time. Statistical analysis involves collecting, organizing, and interpreting numeric data. 1-2-3 has several features that simplify statistical analysis. This chapter describes how 1-2-3 can calculate frequency distributions, perform a regression analysis, and invert and multiply data matrixes.

## Calculating a frequency distribution

A **frequency distribution** counts how many values in a range fall within certain numeric intervals. The **values range** contains the values to count. The **bin range** contains the numeric intervals within which you want to distribute the values.

For example, suppose you want to count how many of your first quarter monthly sales orders for hats are less than or equal to $3,000, how many are greater than $3,000 and less than or equal to $5,000, and how many are greater than $5,000. The monthly sales orders are the values. The bins, the upper limit of each interval, are 3,000 and 5,000.




The resulting frequency distribution shows how many values are equal to or less than the bin value to the left. 1-2-3 also counts any values that are greater than the largest bin value and displays that number in the cell just below and to the right of the largest bin value.

A frequency distribution always produces one more value than the number of bins. If there are no values for a bin, 1-2-3 enters 0 next to

the bin. In the example on the previous page, three orders are less than or equal to $3,000, five are greater than $3,000 and less than or equal to $5,000, and four are greater than $5,000.

**Help** For more information about how to calculate a frequency distribution, search on "Frequency distribution" in Help.

## Performing a regression analysis

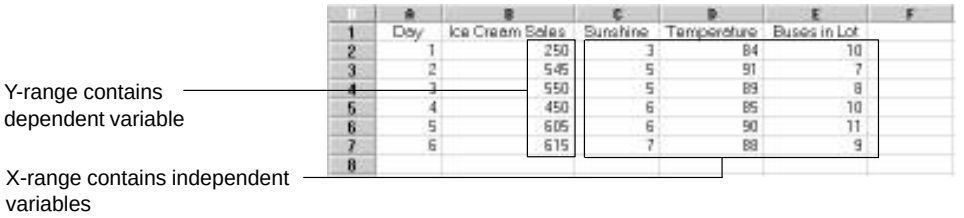
A **regression analysis** determines whether one set of data has any relationship, or **correlation**, to another set of data. Once you calculate these relationships, you can make predictions. 1-2-3 performs **multiple linear regression analysis**, which predicts a value for a single dependent variable based on the values of one or more independent variables.

For example, suppose you run an ice cream stand at a tourist location, and you want to predict approximately how many quarts of ice cream you'll sell the next day. You think that your sales depend on three key factors: the number of hours of sunshine, the midday temperature, and the number of buses in a nearby parking lot. These are called **independent variables**. Since you're assuming your sales depend on these values, sales is the **dependent variable**.

You collect data for a six-day period so you can perform a regression analysis. If the correlation between the three factors and sales is strong enough, you can predict future sales based on the values for the independent variables.

### To perform a regression analysis

To perform a regression analysis, you need to set up three ranges of data: the **y-range** containing the values for the dependent variable, the **x-range** containing the values for the independent variables, and the **output range** where you want 1-2-3 to display the results of the regression analysis. You can enter these ranges in a single worksheet, as shown in the illustration below, or in different worksheets in the same file.




| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Day | Ice Cream Sales | Sunshine | Temperature | Buses in Lot | |
| 2 | 1 | 250 | 3 | 84 | 10 | |
| 3 | 2 | 545 | 5 | 91 | 7 | |
| 4 | 3 | 550 | 5 | 89 | 8 | |
| 5 | 4 | 450 | 6 | 85 | 10 | |
| 6 | 5 | 605 | 6 | 90 | 11 | |
| 7 | 6 | 615 | 7 | 88 | 9 | |
| 8 | | | | | | |

When you choose Range Analyze Regression, 1-2-3 analyzes the relationship between the dependent variable and the independent variables as shown in the illustration below.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Day | Ice Cream Sales | Sunshine | Temperature | Buses in Lot |
| 2 | 1 | 250 | 3 | 84 | 10 |
| 3 | 2 | 545 | 5 | 91 | 7 |
| 4 | 3 | 550 | 5 | 89 | 8 |
| 5 | 4 | 450 | 6 | 85 | 10 |
| 6 | 5 | 605 | 6 | 90 | 11 |
| 7 | 6 | 615 | 7 | 88 | 9 |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | Regression Output: | | | |
| 12 | Constant | | | -2327.9095 | |
| 13 | Std Err of Y Est | | | 32.6714791 | |
| 14 | R Squared | | | 0.97722522 | |
| 15 | No. of Observations | | | 6 | |
| 16 | Degrees of Freedom | | | 2 | |
| 17 | | | | | |
| 18 | X Coefficient(s) | | 61.17698 | 28.4478809 | 0.59564719 |
| 19 | Std Err of Coef. | | 12.18849 | 6.79391567 | 11.8965812 |

Point where regression line intercepts the y-axis

$R^2$ value

Slope for each independent variable

Standard error of each x coefficient

Standard error of estimated y-value

Number of rows of data

Number of observations minus number of independent variables minus 1

The results tell you about the relationships between data. **R Squared** ($R^2$) tells you how closely the independent and dependent variables are correlated, or how much variation in the dependent variable can be explained by the combination of the independent variables. The value of $R^2$ is between 0 and 1. The closer the $R^2$ value is to 1, the more closely the independent variables are related to the dependent variable. Since $R^2$ is close to 1 in the example above, a strong correlation exists between ice cream sales, the weather, and the number of buses.

> **Note** If 1-2-3 displays a value less than zero for $R^2$, you specified a zero intercept when it was not appropriate. Repeat the Range Analyze Regression command, but under Y-intercept, select Compute to have 1-2-3 recalculate the regression and adjust $R^2$ accordingly.

**Help** For more information about how to perform a regression analysis, search on "Regression analysis" in Help.

## To predict values for dependent variables

Once you prove that a relationship exists between the dependent and independent variables, you can use the values for the independent variables to predict values for the dependent variables.

For example, suppose the weather forecast tells you that tomorrow will be cloudy, with only two hours of sunshine and a midday temperature of 84°F. You guess that no more than five buses will

visit. You know there's a strong correlation between the weather, the number of buses, and ice cream sales. So, you can use the values for hours of sunshine, the number of buses, and midday temperature to predict tomorrow's sales.

1. Enter the predicted value for each independent variable in the cell below the column of existing values. Enter text to identify the forecast, as in B:A8 in the illustration below.

Predicted values for independent variables

B:B9 (C9*$C$18)+(D9*$D$18)+(E9*$E$18)+$D$12

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Day | Ice Cream Sales | Sunshine | Temperature | Buses in Lot | |
| 2 | 1 | 250 | 3 | 84 | 10 | |
| 3 | 2 | 545 | 5 | 91 | 7 | |
| 4 | 3 | 550 | 5 | 89 | 8 | |
| 5 | 4 | 450 | 6 | 85 | 10 | |
| 6 | 5 | 605 | 6 | 90 | 11 | |
| 7 | 6 | 615 | 7 | 88 | 9 | |
| 8 | Forecast | | | | | |
| 9 | | 187.0346754 | 2 | 84 | 5 | |
| 10 | | | | | | |
| 11 | | Regression Output: | | | | |
| 12 | Constant | | | -2327.9095 | | |
| 13 | Std Err of Y Est | | | 32.6714791 | | |
| 14 | R Squared | | | 0.97722522 | | |
| 15 | No. of Observations | | | 6 | | |
| 16 | Degrees of Freedom | | | 2 | | |
| 17 | | | | | | |
| 18 | X Coefficient(s) | | 61.17698 | 28.4478809 | 0.59564719 | |
| 19 | Std Err of Coef. | | 12.18849 | 6.79391567 | 11.8965812 | |

2. Enter the formula shown below in a blank cell in the dependent variable column. In the figure above, the formula is in cell B:B9.

   The formula refers to the predicted values and the X Coefficients in the output range of the example. The formula may look complicated, but it's really only the sum of the following items:

The constant (or y-axis intercept)

The third x value multiplied by the third x coefficient

The second x value multiplied by the second x coefficient

The first x value multiplied by the first x coefficient

**+(C9*$C$18)+(D9*$D$18)+(E9*$E$18)+$D$12**

The results of the regression predict that you'll sell approximately 187 quarts of ice cream tomorrow if the weather and number of buses are as forecasted.

**Note** When you use values from the regression output in formulas, select them when building the formula or copy them from the output range. Don't type them over or you may get undesired rounding errors.

## Using data matrixes

Finding solutions to problems with many variables requires using data matrixes. A 1-2-3 **matrix** is a multiple-cell range that contains a value in each cell. The range can be in one worksheet or across worksheets (a 3D matrix). Each value represents a constant in a formula or the coefficient for a variable in a formula.

**Matrix analysis** finds the relationship between two or more sets of variables in one or more formulas. You use the relationships to determine which combination of values will produce the result you want for the formulas.

For example, suppose a bank has three main divisions: business accounts, house loans, and car loans. The bank also has a venture capital branch that takes money from the bank's total income to provide loans for start-up businesses.

By setting up this problem as a series of simultaneous equations, you can use matrix analysis to determine what percentage of its income each division contributes to the total venture funds. The following equation represents this relationship:

*x%**(Business) + *y%**(House) + *z%**(Car) = Total venture funds

*x%*, *y%*, and *z%* are the percentages of their income that each division contributes to the total venture funds. The x, y, and z percentages are what you want to find.

First, you set up a matrix of values for total income received from each of the three sources, and a corresponding column for the total venture funds received, as shown in the illustration below.

Matrix of income values

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | | Total Income from Loans (thousands) | | | | | | |
| 2 | | | | | | | | |
| 3 | | Business | House | Car | | Total Venture Funds | | |
| 4 | 1990 | $10,944.00 | $48,760.00 | $22,451.00 | | $24,300.00 | | |
| 5 | 1991 | $12,321.00 | $46,650.00 | $26,434.00 | | $24,800.00 | | |
| 6 | 1992 | $11,564.00 | $45,732.00 | $21,540.00 | | $23,600.00 | | |

Next, you invert the matrix of income values in range B4..D6, as shown in the illustration below.

Result of inverting the matrix

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | | Total Income from Loans (thousands) | | | | | | |
| 2 | | | | | | | | |
| 3 | | Business | House | Car | | Total Venture Funds | | |
| 4 | 1990 | $10,944.00 | $48,760.00 | $22,451.00 | | $24,300.00 | | |
| 5 | 1991 | $12,321.00 | $46,650.00 | $26,434.00 | | $24,800.00 | | |
| 6 | 1992 | $11,564.00 | $45,732.00 | $21,540.00 | | $23,600.00 | | |
| 7 | | | | | | | | |
| 8 | | -0.00075 | -8.7E-05 | 0.000894 | | | | |
| 9 | | 0.000149 | -8.8E-05 | -4.7E-05 | | | | |
| 10 | | 0.000089 | 0.000234 | -0.00033 | | | | |

You next multiply the inverted matrix by the total venture funds to find what percentage each income source contributes to the total venture funds.

The result is a matrix with the same number of rows as the first matrix and the same number of columns as the second matrix. The resulting matrix contains the solutions for each variable, as shown in the illustration below.

Venture funds matrix (second matrix)

Inverted income source matrix (first matrix)

Result of multiplying the venture funds by the inverted matrix

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | | Total Income from Loans (thousands) | | | | | |
| 2 | | | | | | | |
| 3 | | Business | House | Car | | Total Venture Funds | |
| 4 | 1990 | $10,944.00 | $48,760.00 | $22,451.00 | | $24,300.00 | |
| 5 | 1991 | $12,321.00 | $46,650.00 | $26,434.00 | | $24,800.00 | |
| 6 | 1992 | $11,564.00 | $45,732.00 | $21,540.00 | | $23,600.00 | |
| 7 | | | | | | | |
| 8 | | -0.00075 | -8.7E-05 | 0.000894 | | | |
| 9 | | 0.000149 | -8.8E-05 | -4.7E-05 | | | |
| 10 | | 0.000089 | 0.000234 | -0.00033 | | | |
| 11 | | | | | | | |
| 12 | Business | 58.77% | | | | | |
| 13 | House | 32.33% | | | | | |
| 14 | Car | 9.36% | | | | | |

**Help** For more information about inverting and multiplying matrixes, search on "Matrixes" in Help.

## Inverting and multiplying 3D matrixes

When you invert a 3D matrix, the matrix you want to invert and the results range must be square and contain the same number of worksheets. When inverting a 3D matrix, 1-2-3 inverts the matrix in each worksheet of the 3D range and enters the results in each worksheet.

When you multiply 3D matrixes *both* matrixes must be 3D, and both must contain the same number of worksheets. They must be in the same file but can be in different worksheets. Also, the 3D results matrix must be in the same file as the matrixes you're multiplying but can be in different worksheets.

1-2-3 multiplies the range in the first worksheet of the first matrix by the range in the first worksheet of the second matrix and enters results in the first worksheet; then multiplies the range in the second worksheet of the first matrix by the range in the second worksheet of the second matrix and enters the results in the second worksheet, and so on.

# 19 Solving What-If Problems

A what-if problem is based on a question, such as “What if my sales went up 30%? What would happen to my profits?” A what-if problem can require changing one or more values. This chapter describes how to use Backsolver and what-if tables to solve what-if problems. Version Manager, described in Chapter 17, and Solver, described in Chapter 20, are other tools for solving complex what-if problems.

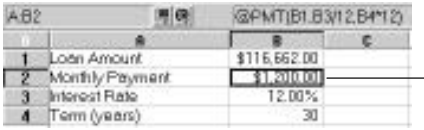
## Using Backsolver

**Backsolver** works backwards from the result of a formula to find the values of one or more variables in the formula. You supply the formula result and specify which variable or variables you want Backsolver to change to arrive at this result. Backsolver then calculates the values of the variable or variables and changes these values in the worksheet.

For example, the worksheet in the illustration below uses @PMT to calculate a monthly loan payment based on a total loan amount of $100,000, an interest rate of 12%, and a term of 30 years. The result of @PMT using these variables is a monthly loan payment of $1,028.61.

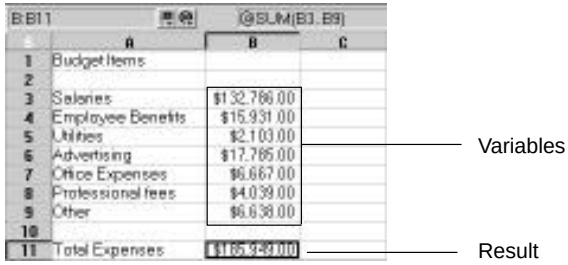
The variables produce this formula result

What if you can afford a $1,200.00 monthly payment? How does that affect the amount of money you can borrow? The next illustration shows how Backsolver recalculates @PMT to produce a monthly payment of $1,200, and enters the changed loan amount, $116,662, in cell B1.

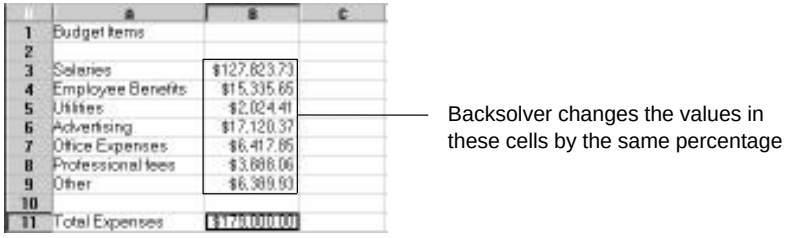



Backsolver finds the loan amount that results in a monthly payment of $1,200

As well as using Backsolver to change a single value, you can also change a range of values by the same percentage so a formula results in the value you specify. For example, the worksheet in the illustration below uses @SUM to calculate the total annual expenses of a small company. The result of @SUM using the values in range B3..B9 is $185,949.




What if you reduce your total expenses to $179,000? How would that affect the value of each item in your budget? You can use Backsolver to reduce all the values in B3..B9 by the same percentage so that @SUM in B11 results in your specified goal of $179,000. The following illustration shows how Backsolver reduces each value so they add up to $179,000.




To solve a problem with Backsolver, you need to specify the following information:

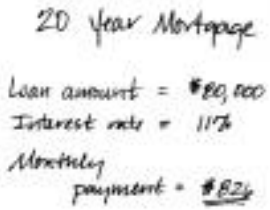
- The address of the formula you want to solve.
- The result you want for the formula.
- The address of the variable or variables you want Backsolver to change to arrive at your result.

**Help** For more information about using Backsolver, search on "Backsolver" in Help.

## Using what-if tables

You can set up a **what-if table** to calculate the results of substituting different values in formulas. You can create tables that substitute values for one, two, or three variables in a formula. These are called 1-variable, 2-variable, and 3-variable what-if tables. The tables you create supply 1-2-3 with everything it needs to solve the what-if problem. Then you use Range Analyze What-if to calculate the results.

To create a what-if table, you supply the formulas and the different values for formula variables. Then 1-2-3 calculates the formulas with every combination of values for the variables and enters the results in the worksheet. You can chart the results to find patterns and relationships.




For example, what-if tables come in handy when you're considering mortgage possibilities. Suppose you decide initially not to borrow more than $80,000. Using a formula, you write out calculations showing that if you borrow $80,000 for 20 years at 11% interest, your monthly payments will be $826.

Next you write out the same calculation with a number of different interest rates starting at 9.5% and going up to 11.5% in 0.5% increments. Since lower interest rates mean lower monthly payments, you explore higher mortgage amounts — $90,000 and $100,000. Finally, you repeat all of these calculations varying the term of the loan, using 10, 15, 20, and 30 year terms.

In the illustration below, your calculations show the monthly payment value for every combination of term, interest rate, and loan amount — a total of 72 separate hand-written calculations.

10 Year Mortgage

| Interest rate | Loan amount $80,000 | $90,000 | $100,000 |
|---|---|---|---|
| 9.5% | 1,035 | 1,165 | 1,294 |
| 10.0% | 1,057 | 1,189 | 1,322 |
| 10.5% | 1,079 | 1,214 | 1,349 |
| 11.0% | 1,102 | 1,240 | 1,378 |
| 11.5% | 1,125 | 1,265 | 1,406 |
| 12.0% | 1,148 | 1,291 | 1,435 |

15 Year Mortgage

| Interest rate | Loan amount $80,000 | $90,000 | $100,000 |
|---|---|---|---|
| 9.5% | 835 | 940 | 1,044 |
| 10.0% | 860 | 967 | 1,075 |
| 10.5% | 884 | 995 | 1,105 |
| 11.0% | 909 | 1,023 | 1,137 |
| 11.5% | 935 | 1,051 | 1,168 |
| 12.0% | 960 | 1,080 | 1,200 |

20 Year Mortgage

| Interest rate | Loan amount $80,000 | $90,000 | $100,000 |
|---|---|---|---|
| 9.5% | 746 | 839 | 932 |
| 10.0% | 772 | 869 | 965 |
| 10.5% | 799 | 899 | 998 |
| 11.0% | 826 | 929 | 1,032 |
| 11.5% | 853 | 960 | 1,066 |
| 12.0% | 881 | 991 | 1,101 |

30 Year Mortgage

| Interest rate | Loan amount $80,000 | $90,000 | $100,000 |
|---|---|---|---|
| 9.5% | 673 | 757 | 841 |
| 10.0% | 702 | 790 | 878 |
| 10.5% | 732 | 823 | 915 |
| 11.0% | 762 | 857 | 952 |
| 11.5% | 792 | 891 | 990 |
| 12.0% | 823 | 926 | 1,029 |

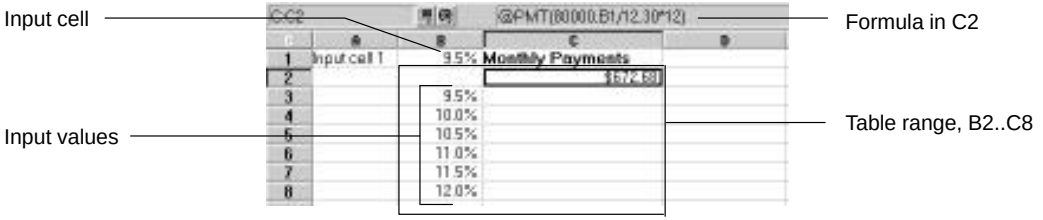
Using a 1-2-3 what-if table gives you the same results in a quicker, more reliable way.

**Help** For more information about using what-if tables to cross-tabulate information in a 1-2-3 database table, search on "Cross-tabulation" in Help.

## Solving a problem by changing one variable

A **1-variable what-if table** displays the result of changing a single variable in one or more formulas. You set up the what-if table by supplying the formulas and the different values you want 1-2-3 to substitute for the variable. You indicate an input cell for 1-2-3 to use during the value substitutions, and then you use Range Analyze What-if Table to calculate the results.

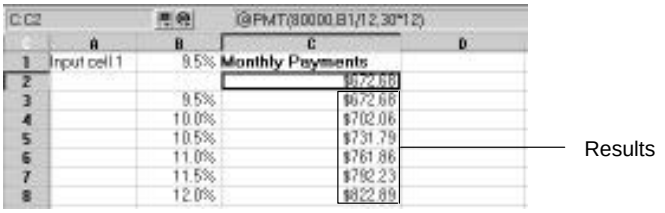
For example, you can create a 1-variable table that shows the monthly payments for a 30-year mortgage of $80,000 at different interest rates. The variable in this what-if problem is the interest rate. You supply the different values for this variable when you set up the what-if table. The illustration below shows how to set up a 1-variable problem with a table range and an input cell outside the table range.



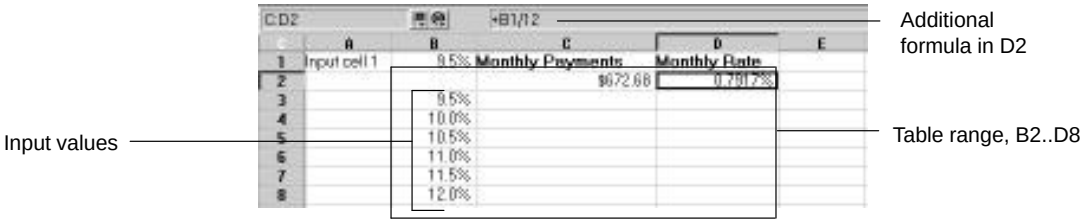

In the example, B1 is the **input cell** where 1-2-3 temporarily stores the different values for the variable while calculating the formula. It's a good idea to label the input cell and enter a sample value to verify that the formula is correct. This also helps you remember where the input cell is and what kind of data it contains. 1-2-3 ignores the sample value when calculating the results.

The table range, B2..C8, includes the input values, the formula, and the cells below the formula where 1-2-3 displays the results. The **input values**, B3..B8, are the various interest rates you want 1-2-3 to substitute in the formula. The formula in C2 uses @PMT.

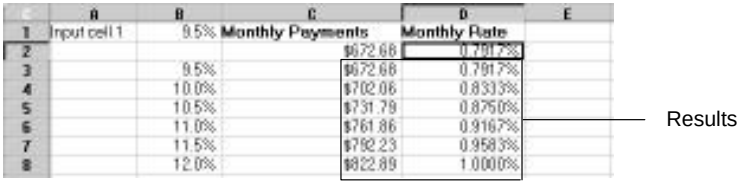
The formula calculates the payment for a 30-year mortgage of $80,000 at the interest rate in B1. The formula must refer to the input cell, B1. When you use Range Analyze What-if Table, 1-2-3 substitutes in B1 all the input values you specified, calculates the formula with all these input values, and displays the results in the cells below the formula, as shown in the illustration below.




You can also set up a 1-variable table that uses the same input values with more than one formula. The 1-variable table below is the same as the previous one, except it contains an additional formula for calculating monthly interest. You can extend the table range by adding adjacent columns to the right for as many formulas as you want.




When you use Range Analyze What-if Table, 1-2-3 substitutes in B1 all the input values you specified, calculates the formulas with all these input values, and displays the results in the cells below the formulas, as shown in the illustration below.

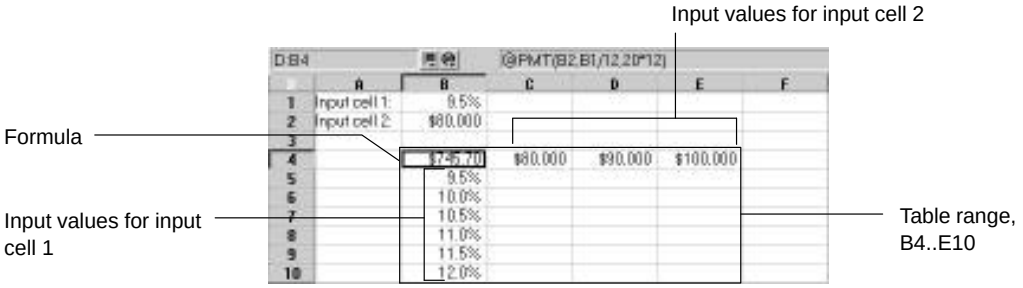



**Help** For more information about setting up and calculating 1-variable what-if tables, search on "1-variable tables" in Help.

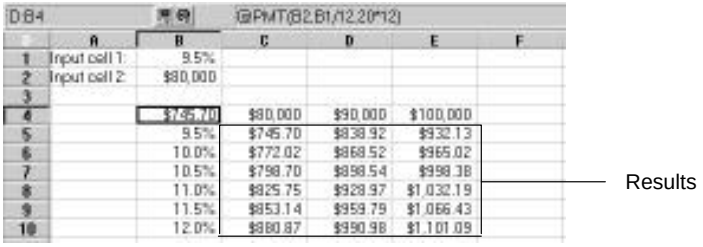
## Solving a problem by changing two variables

A **2-variable what-if table** calculates a formula by changing values for two variables in the formula. 1-2-3 substitutes different values for each variable and displays the results. For example, you can use a 2-variable table to calculate monthly payments for mortgages of $80,000, $90,000, and $100,000 using various interest rates. The variables are interest rate and total mortgage amount.

You set up this problem with a table range and two input cells outside of the table range. For a 2-variable table, the table range includes a single formula, two sets of input values, and space below the input values for 1-2-3 to display the results. The following illustration shows the set-up of the table range and the two input cells for a 2-variable table.



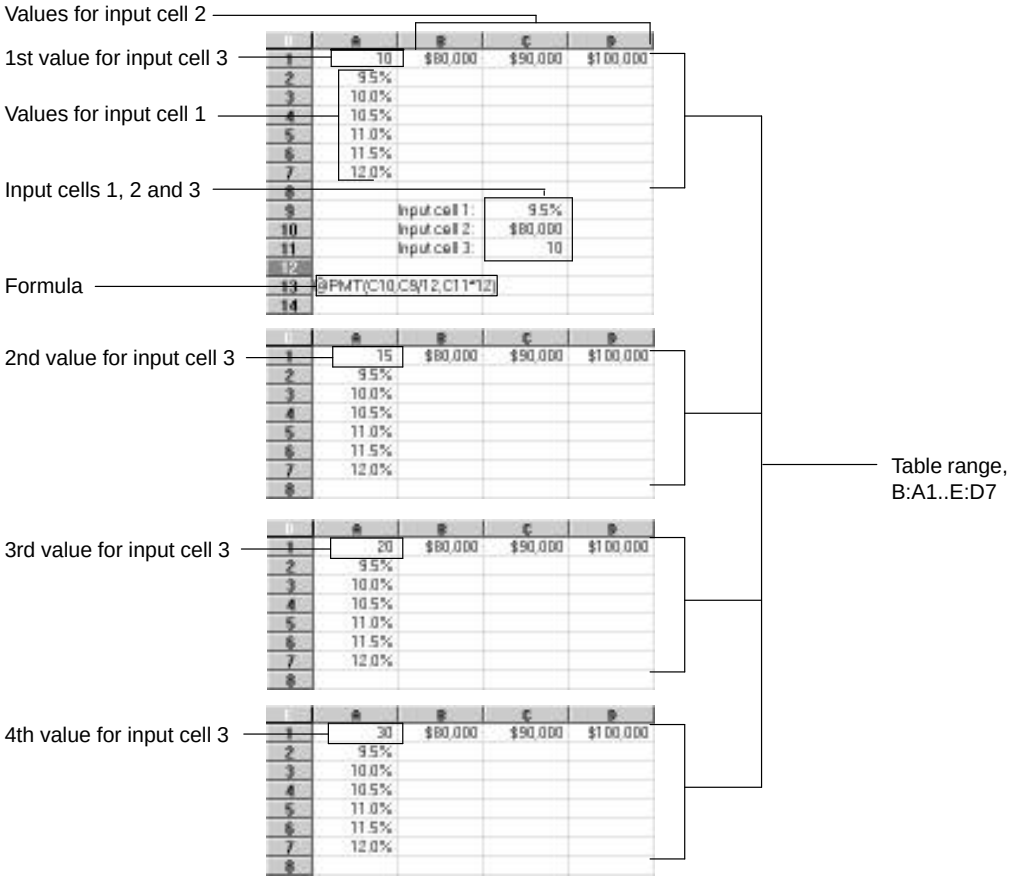

When you choose Range Analyze what-if Table, 1-2-3 substitutes values for the two variables in the formula and displays the results as shown in the next illustration.




**Help** For more information about setting up and calculating 2-variable what-if tables, search on 2-variable tables" in Help.

## Solving a problem by changing three variables

A **3-variable what-if table** calculates a formula by changing values for three variables. 1-2-3 substitutes different values for each variable. For example, you can use a 3-variable table to calculate monthly payments for mortgages of $80,000, $90,000, and $100,000 using various interest rates, and a number of different terms, such as 10, 15, 20, and 30 years. The variables are interest rate, mortgage amount, and term. The illustration below shows the set-up for a 3-variable table using a 3D range across four worksheets.




The set-up of a 3-variable table is similar to the 2-variable table, but the table range is 3D, and the third variable, the term, is different in each worksheet. You put the formula and the three input cells outside the table range. The formula and input cells appear only in the first worksheet, outside the table range. In all other ways, the set-up in each worksheet is the same.

When you choose Range Analyze What-if Table, 1-2-3 calculates the 3-variable what-if problem and displays the results, as shown in the next illustration.

Results

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 10 | $80,000 | $90,000 | $100,000 |
| 2 | 9.5% | $1,035 | $1,165 | $1,294 |
| 3 | 10.0% | $1,057 | $1,189 | $1,322 |
| 4 | 10.5% | $1,079 | $1,214 | $1,349 |
| 5 | 11.0% | $1,102 | $1,240 | $1,378 |
| 6 | 11.5% | $1,125 | $1,265 | $1,406 |
| 7 | 12.0% | $1,148 | $1,291 | $1,435 |
| 8 | | | | |
| 9 | | Input cell 1: | 9.5% | |
| 10 | | Input cell 2: | $80,000 | |
| 11 | | Input cell 3: | 10 | |
| 12 | | | | |
| 13 | @PMT(C10,C9/12,C11*12) | | | |
| 14 | | | | |

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 15 | $80,000 | $90,000 | $100,000 |
| 2 | 9.5% | $835 | $940 | $1,044 |
| 3 | 10.0% | $860 | $967 | $1,075 |
| 4 | 10.5% | $884 | $995 | $1,105 |
| 5 | 11.0% | $909 | $1,023 | $1,137 |
| 6 | 11.5% | $935 | $1,051 | $1,168 |
| 7 | 12.0% | $960 | $1,080 | $1,200 |
| 8 | | | | |

Results

Results

Results

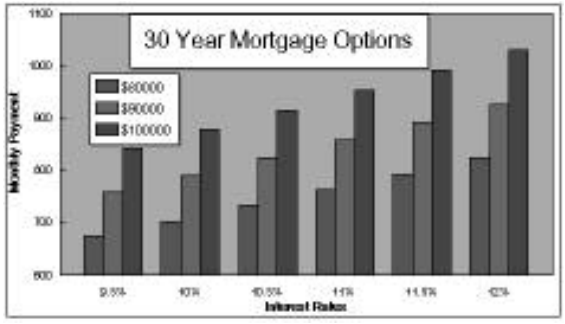
| | A | B | C | D |
|---|---|---|---|---|
| 1 | 20 | $80,000 | $90,000 | $100,000 |
| 2 | 9.5% | $746 | $839 | $932 |
| 3 | 10.0% | $772 | $869 | $965 |
| 4 | 10.5% | $799 | $899 | $998 |
| 5 | 11.0% | $826 | $929 | $1,032 |
| 6 | 11.5% | $853 | $960 | $1,066 |
| 7 | 12.0% | $881 | $991 | $1,101 |
| 8 | | | | |

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 30 | $80,000 | $90,000 | $100,000 |
| 2 | 9.5% | $673 | $757 | $841 |
| 3 | 10.0% | $702 | $790 | $878 |
| 4 | 10.5% | $732 | $823 | $915 |
| 5 | 11.0% | $762 | $857 | $952 |
| 6 | 11.5% | $792 | $891 | $990 |
| 7 | 12.0% | $823 | $926 | $1,029 |
| 8 | | | | |

**Help** For more information about setting up and calculating 3-variable what-if tables, search on "3-variable tables" in Help.

## Charting what-if tables

Creating a chart is a good way to analyze the results of a what-if table. For example, if you decide you can afford a monthly payment between $800 and $900, you can see quickly from the chart below that you have six options. For more information about creating charts, see Chapter 15.



# 20 Using Solver

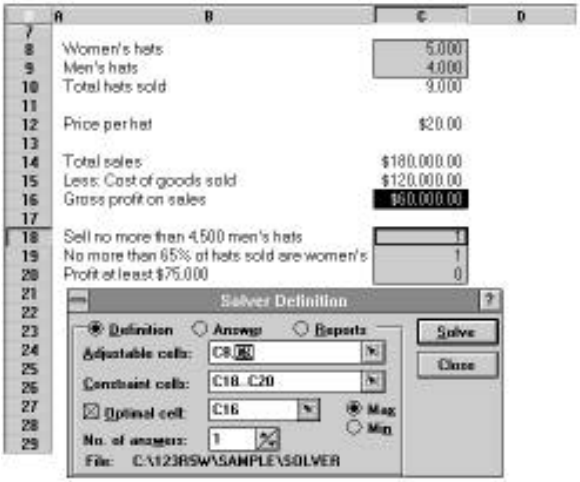
Solver is a tool for solving and analyzing mathematical problems in a worksheet. You express a Solver problem by building a model in your worksheet using the formulas already there, not by using complex modeling languages or unfamiliar metaphors. This chapter describes how Solver works. You can find out how to use Solver and see Solver examples in Help and in the sample solutions file SOLVER.WK4, in the SAMPLE subdirectory of your 1-2-3 directory.

## What can Solver do?

Solver can solve almost any problem that you can describe with algebraic and logical relationships (formulas) in a worksheet. Regardless of the complexity of the problem, most of your work is done before you start Solver, since Solver uses the formulas that already exist in your worksheet.

For example, suppose you use a worksheet to analyze the profits and losses of your hat manufacturing business. Solver can help you determine how to maximize profits by varying the number and mix of hats produced. This problem is in the worksheet titled PL in the Solver sample file.

The formulas in the worksheet define the problem in terms of algebraic and logical relationships that Solver understands. After you start Solver by selecting Range Analyze Solver, you identify these relationships for Solver by specifying ranges in the Solver Definition dialog box.




Solver can provide several answers to a problem, including the optimal answer. By finding multiple answers and presenting the values of all the variables for each answer, Solver can provide you with a wider range of possibilities, one of which might be more useful than the mathematically optimal answer. Because Solver also works with Version Manager, you can preserve any answer as part of a scenario.

You can use Solver when your worksheet model has one or more of the following characteristics:

- Uses numbers and formulas
- Can have more than one meaningful answer
- Iteration (guessing) is the only method of solving
- Contains several variables or formulas that must stay within constraints

**Note** If your problem requires that only one variable reach a single fixed value, without constraints on other variables, try using Backsolver first. For more information, see "Using Backsolver" on page 209.

The following are examples of problems that work well with Solver:

- Planning the most profitable combination of production levels at your company, given the constraints of available resources
- Analyzing a budget to find the best combination of sales increases and cost reductions
- Planning staffing levels to maximize profit without overburdening any one project
- Structuring an investment portfolio for best total return, using information on predicted income, appreciation, and diversification

Once you've found the solution you want, Solver can prepare reports that explain in detail how it approached the problem and how it reached a solution. Solver can report its results in a worksheet file so that you can save, print, or chart the results, or do further calculations.

## How Solver works

Solver uses a combination of symbolic (algebraic) and numeric techniques (or "rules") to find answers. First, Solver tries to solve each problem using symbolic techniques. Then, if it can't find an answer using symbolic techniques, it turns to numeric techniques.

### Symbolic and numeric solving techniques

Symbolic solving techniques use the rules of algebra. For example, suppose A2 contains the formula +A1+5.

| | A | B |
|---|---|---|
| 1 | 20 | |
| 2 | +A1+5 | |

Solver and the worksheet know that +A2=A1+5. Unlike the worksheet, however, Solver also knows that A1=A2–5. Solver uses hundreds of these rules to solve problems that you can't solve with normal worksheet recalculation.

Numeric solving techniques are essentially trial and error, based on guessing or **iteration**. When it uses numeric solving techniques, Solver starts by using the values in the adjustable cells as guesses, then repetitively adjusts these guesses until it finds an answer. Solver uses numeric techniques only if it can't solve the problem using symbolic techniques.

For example, the following formula is too complicated for symbolic techniques, so Solver would try to solve it using numeric techniques.

A1^7+3*(B1)^7+A1*B1–120=–25

Solver determines when to apply symbolic or numeric solving techniques to solve a problem; you don't need to tell Solver which technique to use.

For certain types of problems, Solver knows that numeric solving techniques won't yield a solution. Instead, Solver uses iteration for these problems. When using iteration, Solver may try several different starting values until it either finds an answer or gives up.

Sometimes Solver can't find an answer through iteration starting from the initial values in the adjustable cells. If this happens, Solver asks you to guess the value for some of the adjustable cells to point it in the right direction.

### Multiple worksheets and files

Solver can use cells in any active worksheet or file. You can have many active files in 1-2-3, thus cells in your Solver problem can span more than one active file. However, if you make changes to any of these files that cause 1-2-3 to recalculate after Solver solves the problem, Solver discards all the answers it found.

To avoid losing your answers, create a report in a worksheet (a Solver table report) before changing anything in the active files. Remember to save the report if you want to preserve the answers.

**Help** For more information about saving Solver answers, search on "Answers" in Help.

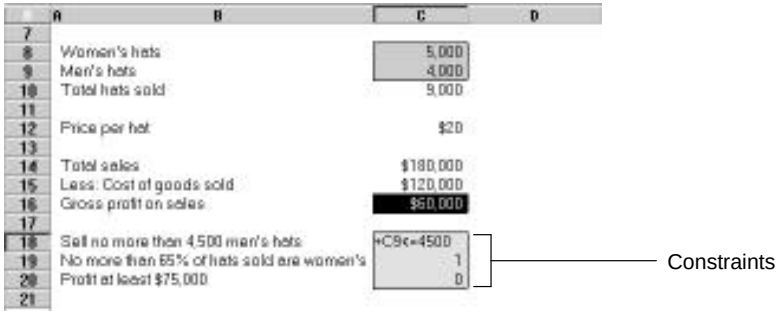
## Using Solver

Because Solver uses the relationships you created when you built your worksheet, most of the work in using Solver involves defining the constraints and the objectives of the problem.

### Setting up the constraints

**Constraints** are logical formulas in the worksheet that specify conditions you want each answer to satisfy. A **logical formula** returns either 1 (true) or 0 (false) depending on whether a condition is satisfied and uses logical operators such as < , >, <=, >=, or = to define the condition.

In the hat manufacturer example shown below, the constraint to sell no more than 4,500 men's hats is expressed in cell C18 as the logical formula +C9<=4500.




## Determining adjustable cells

**Adjustable cells** contain the values that Solver can change when attempting to satisfy the constraints. You must provide one adjustable cell for each variable you want Solver to change. Adjustable cells can't contain formulas or text. In the example above, the adjustable cells are C8 and C9.

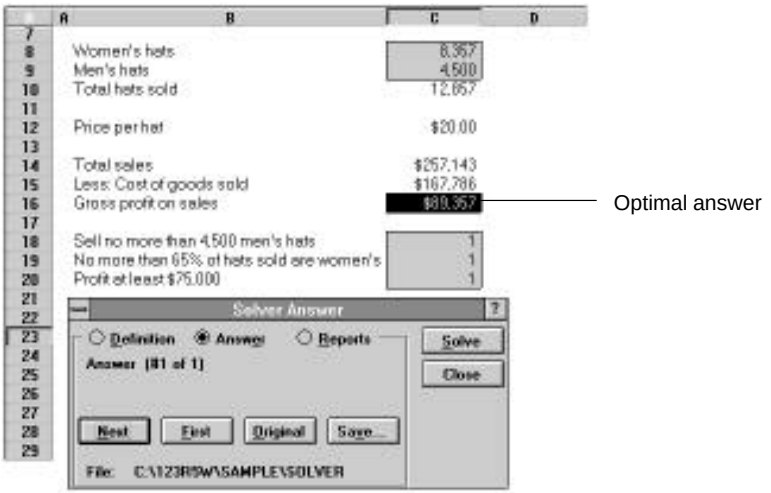
## Determining an optimal cell

An **optimal cell** contains a value or formula that you want Solver to maximize or minimize within the constraints of the current problem. The optimal cell can be an adjustable cell but it can't be a constraint cell.

If it can use algebraic techniques to solve the problem, Solver can find an **optimal answer**. This is the answer that maximizes or minimizes the optimal cell. Otherwise, it finds a **best answer**. In the example, the value to maximize is gross profit on sales, so cell C16 is the optimal cell.

## Viewing answers

When Solver finishes solving the problem, it places the optimal or best answer in the worksheet. The example shows that Solver found $89,357 to be the optimal answer.

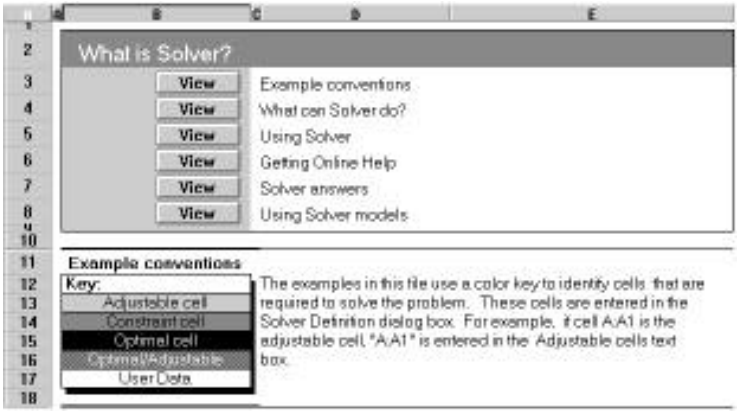



The dialog box stays open to let you display other answers and create reports.

## Solver examples

If you would like to work with some Solver examples, you can use the sample file, SOLVER.WK4. The Install program copied SOLVER.WK4 to the subdirectory SAMPLE in your 1-2-3 directory. (If you're using the network version of 1-2-3, SAMPLE is a subdirectory in your personal directory.)

SOLVER.WK4 file contains 11 examples of varying complexity, ranging from simple mortgage problems to complex budgeting problems. Each example occupies a worksheet in the file. The first worksheet, shown below, is an introduction, which includes the conventions used in the sample file. A table of contents appears at the bottom of the introduction sheet. To see a specific example, look it up in the table of contents and select the appropriate worksheet tab.




Each example in SOLVER.WK4 has the adjustable cells, constraint cells, and the optimal cell identified and ready for Solver to use. You can solve each example by using the Range Analyze Solver command or by pressing the macro button titled "Example."

## Solver answers

This section describes how to save Solver answers and gives you information about how to interpret answers.

**Help** For more information about interpreting Solver answers, search on "Answers" in Help.

### Saving answers

Once you solve a problem, you can save the problem statement — the adjustable, constraint, and optimal cells — by saving the file that contains the problem. Then the next time you open the file you can choose Range Analyze Solver and solve for the answers again.

1-2-3 also provides ways to save the answers themselves. You can save a single answer with your original problem statement, or you can save a list of all answers by producing and saving an Answer table report. You can also save an answer as a scenario, which allows you to view and share the answer using Version Manager.

**Help** To find out how to save Solver answers, search under "Saving a Solver table report," "Answer table," and "Scenarios from Solver" in Help.

## Number of answers

Solver doesn't always find the number of answers you specify when you set up a problem. If there are fewer possible answers than you specified, Solver finds only that number of answers.

Sometimes Solver finds more answers than you specified. For example, if an equation has more roots than the number of answers you specified, Solver finds all of them. Solver also finds one more answer than specified when the original values you supplied constitute a valid answer. You can choose Solve in the Solver Answer dialog box to find out if Solver can find more answers.

## Avoiding negative answers

Solver sometimes returns negative numbers when you try to minimize the optimal cell. If you want the values of your adjustable cells and the optimal cell to be always positive, enter a new constraint for each adjustable cell and for the optimal cell to specify that the cells must be greater than or equal to 0.

For example, if A1 is an adjustable cell for which you want to see only positive values, include +A1>=0 as a new constraint. Make sure you specify the new constraint cells in the Solver Definition dialog box.

## Avoiding roundoff errors

When Solver finds an answer, it places that answer in the adjustable cells and lets the worksheet calculate the result. In some cases, the worksheet, which sometimes uses different calculation methods from Solver, calculates a result that doesn't satisfy one or more constraints. This is called a **roundoff error**.

Roundoff errors occur most often when Solver works with very small or very large numbers. An answer with a roundoff error is still a valid answer. In most cases, roundoff errors shouldn't affect how you use the answer.

**Help** For more information about roundoff errors, search on "Roundoff errors" in Help.

## Solver reports

Solver reports help you understand how Solver determined answers, how one answer compares to other answers, and how much flexibility you have in changing an answer. This information can help you select the answer that's most appropriate for you. Because reports can be separate worksheet files, they also preserve the answers, allowing you to change the original files without losing the answers.

**Help** For more information about the types of Solver reports available and how to use them, search on "Solver reports" in Help.

## Tips on using Solver

This section provides information that can help you set up problems for Solver.

### Using @functions in Solver problems

Since Solver problems are based on ordinary worksheets, @functions that are useful in a worksheet are equally useful in Solver problems based on that worksheet. Here are some things to remember when using @functions:

- Make sure the formulas in your model contain @functions that Solver supports.

**Help** For a list of the @functions Solver supports, search on "@Functions in Solver problems" in Help.

- Adding and multiplying @functions together, or using large ranges in @HLOOKUP, @VLOOKUP, or statistical @functions, may make a problem difficult to solve.
- Limit the use of @CHOOSE, @HLOOKUP, @IF, @INDEX, @INT, @MOD, @ROUND, and @VLOOKUP. Also, don't combine these @functions in a formula. Although Solver supports these @functions, they can make a problem difficult to solve.
- Limit the use of nested @functions, especially @IF. If Solver can't solve a problem that has many nested @functions, rewrite the @functions across several cells.

### Maximum problem size

Solver can't solve large problems that require more memory than your computer can provide. Both the number of cells involved and the complexity of the model affect Solver's ability to solve a problem.

In particular, the number of cells containing formulas affecting the optimal cell can have a significant effect.

Here are some guidelines for designing a problem that Solver can solve quickly and efficiently:

- Solver uses the combined total of adjustable cells, constraint cells, the optimal cell, and any other cells it needs to compute the answer. Try to keep this combined total to fewer than 1,000 cells.
- Use Tools Audit to determine the number of formulas affecting the optimal cell. If a formula isn't connected directly or indirectly to an adjustable cell you can convert it to a constant to simplify the problem. You can do this by converting formulas to their values using Edit Paste Special, or by using the {RANGE-VALUE} macro command.
- The number of formulas and the number of relationships between formulas in the model can sometimes have more impact than size.
- Increasing the number of adjustable cells and constraint cells usually increases the time required to find all the answers.
- Using @functions other than @SUM and @AVG increases the chance that Solver needs you to supply guess values before it can find an answer.
- Increasing the number of adjustable cells and @functions increases the chance that 1-2-3 won't have enough memory to solve the problem.

## Related Help topics

You can use macros to perform most of the functions that you perform with Solver menu commands. For more information, search on "Solver macro commands" in Help.

# 21 Working with 1-2-3 Databases

1-2-3 makes using database tables easy because you work entirely with menu commands, the mouse, and SmartIcons. You never have to memorize or type field names, criteria ranges, values, or logical operators. If you have Lotus Approach Release 3.0 or later, you can use its powerful features to manage and analyze data contained in 1-2-3 database tables, without leaving 1-2-3. This chapter describes how to create and query 1-2-3 database tables and external tables that you connect to. It also explains how to view, organize, and analyze your data using Lotus Approach. For information about connecting to external database tables, see Chapter 22.

## What is a 1-2-3 database table?

A **1-2-3 database table** is a worksheet range containing data organized as fields and records. A **field** is a column that contains a single category of data, such as telephone numbers. A **record** is a row containing data for each field, such as one person's name, ID number, department, and telephone number. The top cell in each column must contain a **field name**, a label that identifies the category of data in the column.

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | LAST | FIRST | ID | EXT | DEPT | CITY | |
| 2 | Amadeus | Jordan | 3307 | 4260 | Sales | Los Angeles | |
| 3 | Anthony | Ruth | 978 | 1851 | Marketing | Boston | |
| 4 | Janelle | Rapsody | 9372 | 1876 | Manufacturing | Baltimore | |
| 5 | Cooke | Mattie | 970 | 1915 | Sales | Birmingham | |
| 6 | Joan | Betty | 9057 | 1899 | Executive | Cambridge | |
| 7 | Alexay | Elijah | 86 | 3500 | Sales | New York | |
| 8 | Leeya | Basha | 231 | 2262 | Sales | Paris | |
| 9 | Moriah | Joshua | 734 | 8975 | Research | Boston | |
| 10 | Shing | Victor | 4481 | 0752 | Sales | London | |
| 11 | Antoinette | Erika | 1426 | 968 | Research | Tokyo | |

Field names

A field

A record

You set up a 1-2-3 database table with field names, fields, and records so you can manipulate large amounts of data and get precisely the information you need. Once you set up a 1-2-3 database table, you can perform queries by creating query tables; and you can find, add, and delete records. You can also use database @functions.

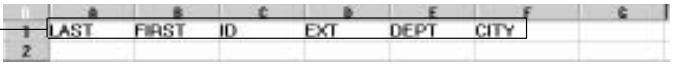
## Creating a 1-2-3 database table

A 1-2-3 database table must fit on a single worksheet and can contain up to 256 fields and 8,191 records.

### To create a 1-2-3 database table

1. Enter field names in adjacent cells in an empty row. Field names must be in one row only; this is the first row of your table.

Field names

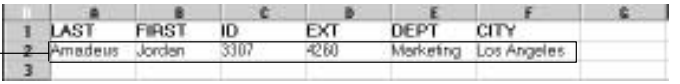



Use the following guidelines when naming fields:

- Use a label for each field name, rather than a number or formula. If you use numbers and formulas as field names, you can get unexpected results.
- To enter a field name that begins with a number or other non-alphabetic character, precede the name with a label-prefix character.
- Don't use the same field name for more than one field in the same table.
- Don't use , (comma), . (period), : (colon), ; (semicolon), - (hyphen), # (number sign), ~ (tilde), ! (exclamation point), spaces, or arithmetic operators in a field name.
- Don't use field names that look like cell addresses, such as P12, X24, or EX100.

2. Enter the data for the first record in the row immediately below the field names. Don't leave an empty row.
   - You can enter text, numbers, @functions, or formulas. You get more reliable results when you query a database table if your @functions and formulas contain absolute rather than relative references.

First record




- Don't use a repeating character, such as a hyphen, to separate the row containing field names from the data.
- You get more reliable results when you query a table if all entries in the same field contain the same type of data. It's better, for example, if a field for street addresses contains all labels rather than a mixture of labels and values.

3. Enter the other records without leaving empty rows between them.

   1-2-3 lets you enter duplicate records, but a database table is more convenient to use if each record has at least one unique field entry. For example, include a field containing unique ID numbers when you create a table.

4. If you want, you can name your 1-2-3 database table using the Range Name command.

   Assigning a range name to a database table makes it easier to specify the table for Tools Database commands and @functions. Also, you must name your tables if you want to join them. For more information about naming a range, see Chapter 9.

   Use the following rules when you name tables:

   - The row containing the field names must be the first row of the named range.
   - To avoid confusion, don't use a range name that matches a field name in the same table or any other table you want to query.

5. If you want, you can add styles, such as text attributes, number formats and alignments, to the data in a database table. For information about changing the appearance of data in a worksheet, see Chapter 12.

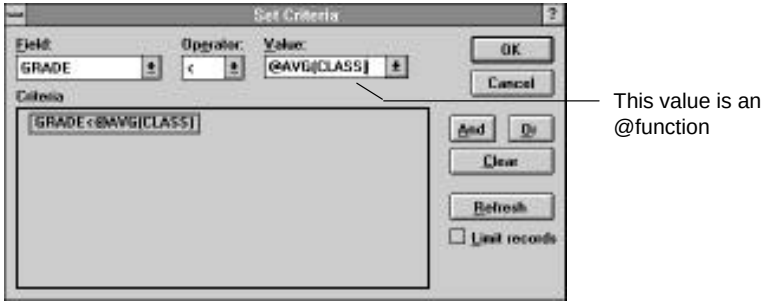
## Using criteria

You use criteria when you work with query tables, join database tables, and when you find, append, and delete records. **Criteria** tell 1-2-3 which records you want to work with. Rather than entering criteria in a range, you specify and manipulate them directly in a dialog box. The database dialog boxes display criteria and the relationships between multiple criteria graphically. This makes criteria easy to understand and use.

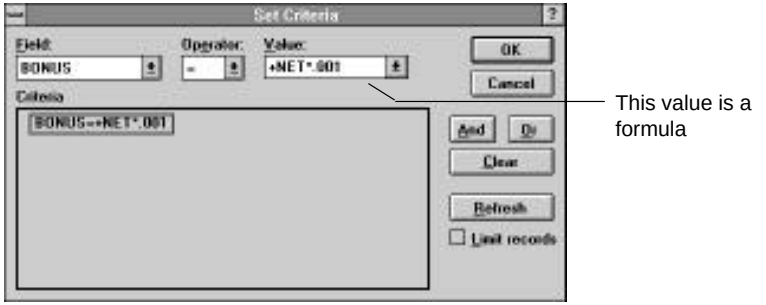
In all the dialog boxes where you build criteria, you can specify numbers, labels, formulas, @functions, and logical operators. You build a criterion in a dialog box by selecting a field, a logical operator, and a value. 1-2-3 provides field names and values for each field in the table; you don't have to write them down or memorize them.

## Using @functions and formulas in criteria

You can enter an @function or a formula as the value in a criterion. For example, to find students whose grades are below the class average, you can enter an @function as shown below.




To find anyone whose profit-sharing bonus wasn't equal to .1 percent of the net profits, you can enter a formula as the value of the criterion as shown below.



## Using multiple criteria

You can specify more than one criterion by using the logical operators And and Or. When you use And with multiple criteria, you narrow the search. When you use Or, you expand the search.

For example, suppose you want records of employees who work in the Sales department in Boston. First, you specify the criterion CITY=Boston. Next, to narrow the search, you choose the logical operator And. Then, you specify a second criterion, DEPT=Sales. The illustration below shows how 1-2-3 graphically represents the And relationship between multiple criteria.

You can use Or to display records of employees who work in either Boston or Paris. First, you specify the criterion CITY=Boston. Next, to expand the search, you choose Or as the logical operator. Then, you specify the second criterion, CITY=Paris. The illustration below shows how 1-2-3 graphically represents the Or relationship.

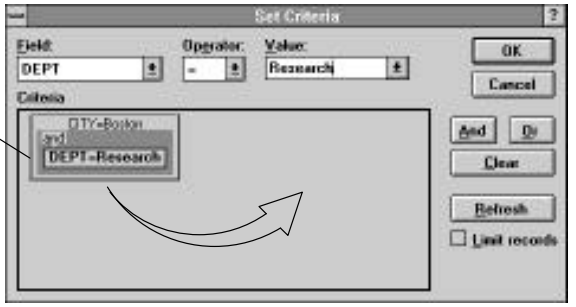
You can also specify multiple criteria with combinations of And and Or relationships. For example, suppose you want to display the records of employees in the Sales department who work in either Boston or London. All records must meet the criteria DEPT=Sales, And CITY=Boston Or CITY=London. The next illustration shows how 1-2-3 graphically represents the logical relationship between these criteria.

Combination of And and Or

## Changing relationships between criteria

You can change the logical relationship between one criterion and another by dragging a criterion to a different position. For example, the illustrations below show how you can drag the box containing the criterion DEPT=Research to the right to change CITY=Boston And DEPT=Research to CITY=Boston Or DEPT=Research.

Drag this criteria to the right ...




... to change the relationship to Or

You can move and copy a box containing more than one criterion. Select the box and **SHIFT**+drag to move it or **CTRL**+drag to copy it.

## Using wildcard characters in criteria

You can also specify **wildcard characters** in the value of a criterion to search for records that match certain characters in a field. To match any single character, use a ? (question mark) where you want the match. For example, if you specify Jo?n as the value, as shown below, 1-2-3 displays last names such as John, Joln, Jonn, Jorn and so on.

The * (asterisk) matches all characters from * to the end of the label (up to, and including, the 512-character maximum). For example, if you specify Jo*, as shown below, 1-2-3 displays all last names that begin with Jo, such as Joanas, Joannas, Johnson, Jones and so on.

## Using query tables

A **query table** is a workspace where you can work with data from a 1-2-3 database table or an external table. It's set up like a database table with fields, field names, and records. You can specify criteria and choose which fields to display, so the query table contains only the database records you want. In the query table, you can display data to use in reports and models without changing any data in the source database table.

The source database table

A query table

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | LAST | FIRST | ID | EXT | DEPT | CITY | |
| 2 | Amadeus | Jordan | 3307 | 4260 | Sales | Los Angeles | |
| 3 | Cooke | Mattie | 970 | 1915 | Sales | Birmingham | |
| 4 | Jean | Betty | 9057 | 1899 | Executive | Cambridge | |
| 5 | Alexey | Elijah | 86 | 3500 | Sales | New York | |
| 6 | Leeya | Bashe | 231 | 2262 | Sales | Paris | |
| 7 | Moneh | Joshua | 734 | 8975 | Research | Boston | |
| 8 | Shing | Victor | 4461 | 0752 | Sales | London | |
| 9 | | | | | | | |
| 10 | | LAST | FIRST | ID | EXT | DEPT | CITY |
| 11 | | Amadeus | Jordan | 3307 | 4260 | Sales | Los Angeles |
| 12 | | Cooke | Mattie | 970 | 1915 | Sales | Birmingham |
| 13 | | Jean | Betty | 9057 | 1899 | Executive | Cambridge |
| 14 | | Alexey | Elijah | 86 | 3500 | Sales | New York |
| 15 | | Leeya | Bashe | 231 | 2262 | Sales | Paris |
| 16 | | Moneh | Joshua | 734 | 8975 | Research | Boston |
| 17 | | Shing | Victor | 4461 | 0752 | Sales | London |
| 18 | | | | | | | |

You can name a query table, style it, and sort the records in it. After working with data in a query table, you can leave the data in the source database table intact or update the table to reflect your changes. You can also refresh the data in a query table to reflect changes in the source database table.

## To create a query table

1. Choose Tools Database New Query.

2. Specify the range containing the database table; or, if the table you want to query is an external table or a named table, press **F3 (NAME)** or click the navigator and select the table name from the list.

   To query an external table you're not connected to, choose External and connect to the table.

*You can also choose which fields to display and set criteria after you create the query table.*

3. To specify which fields you want to appear in the query table, and the order of these fields, choose Choose Fields and follow the procedure for choosing fields described on page 240.
4. To specify which records appear in the query table, choose Set Criteria and follow the procedure for setting criteria described on page 238.

   When you query an external table, by default 1-2-3 limits the number of records in the query table to the first 25 that meet the criteria; use Set Criteria to change this limit.
5. Specify a location for the query table. Make sure the query table doesn't overlap the database table.

   **Caution** 1-2-3 writes over existing data in the query table range.

   If you specify the top left cell of a range, the query table contains as many of the fields and records as fit within the boundaries of the worksheet.

   If you specify a multiple-cell range, 1-2-3 displays only the fields and records that fit in that range. For example, if you specify a range of 5 columns and 10 rows, 1-2-3 displays a query table that contains the first 5 fields and the first 10 records in the order in which they appear in the database table. If you subsequently size the query table larger, 1-2-3 displays the additional fields and records.
6. Choose OK.

1-2-3 displays the query table. A dashed border around the query table indicates that you can size it to display more data. You can use the icon at left to expand the table to show all additional fields and records that fit within the worksheet boundaries.

To select an entire query table, click the border of the table. To select an entire field, click the cell containing the field name. You can also size, move, copy and delete a query table as you do a drawn object. For more information, see "Working with drawn objects" on page 178.

## To style a query table

When you create a query table, it inherits the styles and formats from the source database table. You can style the fields in a query table and change the appearance of data. For example, you can change the number format or the text color in a field.

1. To style the data in a field, select the first cell in the column below the field name.
2. Apply styles using Style Lines & Colors, Style Font & Attributes, and Style Number Format.

   For more information about changing the appearance of data, see Chapter 12.
3. Choose Query Refresh Now to apply the styles or formats to all the other cells in the field.

## To set criteria for a query table

When you set criteria for a new or existing query table, only data matching the criteria appears in the query table. For more information about using criteria, see page 231.

1. Do one of the following:

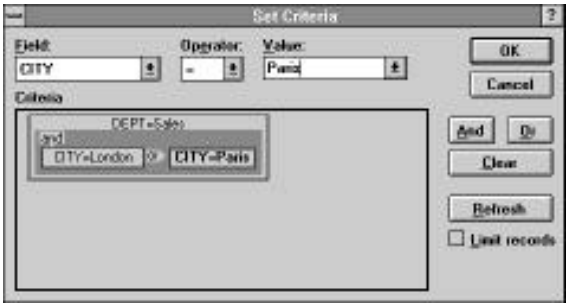
   - To set criteria for a new query table, select the range containing the database table, choose Tools Database New Query, then choose Set Criteria.

   - To set criteria for an existing query table, click the border of the query table to select it, then choose Query Set Criteria.
2. Specify a criterion by doing the following:
   - Select the field from the Field drop-down box.
   - Select the logical operator from the Operator drop-down box.
   - Specify the value in the Value drop-down box.

   For example, if you want the records of everyone in the Sales department, the criterion is DEPT=Sales; where DEPT is the field, = is the logical operator, and Sales is the value.
3. To narrow the search, choose And and repeat Step 2.
4. To expand the search, choose Or and repeat Step 2.
5. To remove a criterion, click the box that contains the criterion and choose Clear.
6. To apply new or changed criteria to the query table without closing the Set Criteria dialog box, choose Refresh.

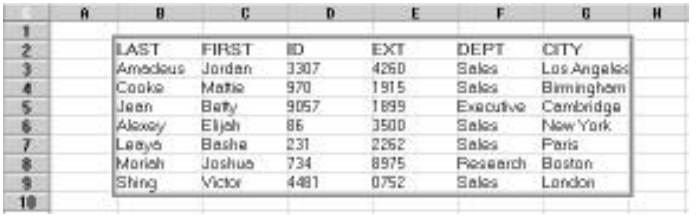
7. To specify the number of records you want to appear in the query table, select the Limit records check box and enter a number.
8. Choose OK.

For example, to display in your query table only records for people in the Sales department in London and Paris, you set the criteria DEPT=Sales, And CITY=London Or CITY=Paris, as shown in the dialog box below.



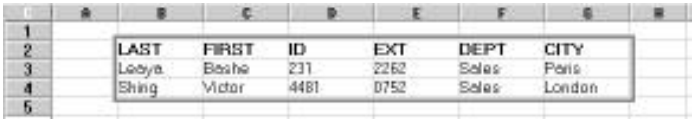

The next illustration shows the query table before and after using Query Set Criteria to set these criteria.

**Before**



| LAST | FIRST | ID | EXT | DEPT | CITY |
|---|---|---|---|---|---|
| Amadeus | Jordan | 3307 | 4260 | Sales | Los Angeles |
| Cooke | Mattie | 970 | 1915 | Sales | Birmingham |
| Jean | Betty | 9057 | 1899 | Executive | Cambridge |
| Alexey | Elijah | 86 | 3500 | Sales | New York |
| Leaya | Basha | 231 | 2262 | Sales | Paris |
| Morish | Joshua | 734 | 8975 | Research | Boston |
| Shing | Victor | 4481 | 0752 | Sales | London |

**After**



| LAST | FIRST | ID | EXT | DEPT | CITY |
|---|---|---|---|---|---|
| Leaya | Basha | 231 | 2262 | Sales | Paris |
| Shing | Victor | 4481 | 0752 | Sales | London |

## To choose fields in a query table

You can specify what fields you want to appear in a new or existing query table. You can also specify the order in which you want the fields to appear.

1. Do one of the following:

   - To choose fields for a new query table, select the range containing the database table, choose Tools Database New Query, then choose Choose Fields.

   - To choose fields for an existing query table, select the query table, and then choose Query Choose Fields.

   The Selected fields list box displays all the fields in the query table.

2. To remove fields from the query table, select them from the Selected Fields list box and choose Clear.
3. To add a field that appears in the database table but not in the query table, choose Add. Then select the field name, select an option under Insert, and choose OK.
4. To change the order of the fields in the query table, select a field in the Selected Fields list box and click the up or down arrow until the field is in the position you want.
5. Choose OK.

**Help** In the Choose Fields dialog box, you can also create a computed column by choosing Formula. For example, you can create a column that calculates a 5% bonus based on the value in the SALES column. For information about computed columns and how to create them, search on "Computed columns" in Help.

## To rename a query table

When you create a query table, 1-2-3 assigns a default name to the table, starting with Query 1. You can use the Query Name command to assign a more descriptive name to the table. You can use a query table name in formulas, and you can also go to and select a named query table by using Edit Go To.

1. Select the query table.
2. Choose Query Name.

   The default name of the query table appears in the Query name text box.

3. Enter the new name in the Query name text box.

   The name can be up to 15 characters long. You can't name a query table with the same name as another query table in the current file.

4. Choose Rename.

## To sort records

You can change the order of the records in a 1-2-3 database table or query table by sorting them.

1. Select a cell in the query table, or select the range containing the database table.

   Don't include the field names in the range containing the database table.

2. Choose Query Sort to sort a query table or Range Sort to sort a database table.

Help button

   If you're sorting a query table, the "Sort by" drop-down box displays the names of the fields in the query table. If you're sorting a database table, "Sort by" is a text box where you specify a cell in the field you want to sort by.

*Before sorting a database table, add a new column and use Range Fill to fill it with a sequence of numbers. This column defines the pre-sorted order of records. When you sort the table, include this column in the sort range. You can restore the original order by sorting on this column.*

3. Under "Sort by," select the name of the field in the query table you want to sort by, or select a cell in the field of the database table.

   The field you sort by is your **sort key**. You can use up to 255 sort keys.

4. Select an option.
   - Ascending sorts A – Z, and smallest number to largest number.
   - Descending sorts Z – A, and largest number to smallest number.

For example, you can sort in order of highest to lowest sales totals.

5. To specify additional sort keys, choose Add Key and repeat steps 3 and 4.

   For example, if the Last_Name field is sort key 1, select the First_Name field as sort key 2.

6. Choose OK.

1-2-3 sorts data according to the sort order specified during installation. The **sort order** is the order 1-2-3 uses for letters, numbers, blank cells, and symbols when you sort. The default sort order, Numbers first, sorts in the following order:

- Blank cells
- Labels beginning with a space
- Labels beginning with numbers in numerical order
- Labels beginning with letters in alphabetical order, with lowercase letters preceding uppercase letters; for example, a before A, b before B, and so forth
- Labels beginning with other characters in the Lotus Multibyte Character Set (LMBCS) code order

  **Note** For more information about LMBCS code order, see Appendix C.
- Values in numerical order

To change the default sort order, use the 1-2-3 Install program.

**Help** For more information about different sort orders, search on "Sort order" in Help. For information about deleting sort keys, search on "Clearing sort ranges and keys" in Help.

## To refresh a query table

You can refresh a query table to reflect changes in the source database table.

1. Select the query table.
2. Choose Query Refresh Now.

**Help** You can also use Query Refresh Now to update any settings you specified with Query Set Options. For more information, search on "Query options" in Help.

## To update a database table

You can update records in the source database table to reflect changes in a query table. For example, suppose you're consolidating the London and Paris sales offices to Barcelona. First you create a query table and set criteria so that only members of the London and Paris Sales departments appear in the table. You edit all these records to make the location Barcelona. Then you update the source database table with the modified records.

1. Choose Query Set Options.
2. Select "Allow updates to source table."
3. Choose OK.
4. Edit the query table.
5. Choose Query Update Database Table.

**Note** Since you can't update more than one database table at a time, you can't update joined tables. You also can't update computed columns or aggregate fields.

## Using Lotus Approach with 1-2-3 databases

You can use Lotus Approach Release 3.0 or later from within 1-2-3. Lotus Approach works directly on your 1-2-3 data and lets you create:

- Forms to view, enter, and edit the data, one record at a time
- Reports to organize, analyze, and present data
- Dynamic crosstabs to organize and summarize categories of data
- Mailing labels using various predefined formats

You can also use Approach to modify 1-2-3 database tables, sort, and query data.

You access Lotus Approach from the Tools Database menu.

**Help** To find out how to use Lotus Approach forms, reports, dynamic crosstabs, and mailing labels, search on "Approach" in Help.

## Finding records

You can use Tools Database Find Records to highlight database table records that you want to modify or review. Also, when you specify multiple criteria, it's a good idea to check that the criteria select the correct records. Tools Database Find Records highlights all the records in a 1-2-3 database table that meet the criteria you specify.

## To find records

1. Select the range containing the database table.
2. Choose Tools Database Find Records.
3. Specify a criterion by doing the following:
   - Select the field from the Field drop-down box.
   - Select the logical operator from the Operator drop-down box.
   - Specify the value in the Value drop-down box.

   For example, to find the records of everyone in the Sales department, the criterion is DEPT=Sales; where DEPT is the field, = is the logical operator, and Sales is the value.
4. To narrow the search, choose And and repeat step 3.

   For example, to find everyone in the Sales Department whose salary is greater than $40,000, choose And, then specify SALARY>40,000; where SALARY is the field, > is the logical operator, and 40,000 is the value.
5. To expand the search, choose Or and repeat step 3.

   For example, to find everyone in the Sales Department or in the Finance Department, choose Or, then specify DEPARTMENT=Finance; where DEPARTMENT is the field, = is the logical operator, and Finance is the value.
6. Choose OK.

*If you want to distinguish the records you found from other data in the table, use Style Lines & Color to give a background color to the collection of found records.*

1-2-3 highlights a collection of all records that meet your criteria. You can move around and edit the highlighted records as described below.

| *To* | *Press* |
|---|---|
| Go to the next record | **CTRL+ENTER** |
| Go to the previous record | **CTRL+SHIFT+ENTER** |
| Go to the next cell in a record | **ENTER** |
| Go to the previous cell in a record | **SHIFT+ENTER** |
| Edit data in a record | **F2 (EDIT)**, make your edits, and press **ENTER** to go to the next cell |
| Deselect the collection of highlighted records | **ESC**, or click any cell |

## Appending records to a database table

The best way to add records to the bottom of a 1-2-3 database table is to use Tools Database Append. When you use this command, 1-2-3 expands the named range of the table to include the appended records. Also, you can use this command to append records to an external table.

You can also append new records to a 1-2-3 database table by entering data for each field in the row immediately below the last record in the table. If the appended records are outside of the original named range of the table, however, you must use the Range Name command to redefine the range so it includes the new records.

### To append records

1. Select the range containing the records you want to append to the database table.

   Make sure to include the field names as the first row of the range. All the field names in the range you're appending must match the field names in the table to which you're appending records.
2. Choose Tools Database Append Records.
3. In the "To database table" text box, specify the table to which you're appending the records.
4. Choose OK.

1-2-3 appends the records to the bottom of the database table and expands the table range. After appending, you can sort records in the table. For more information about sorting records, see page 241.

## Deleting records from a database table

You can delete records from one database table at a time. 1-2-3 deletes all records that meet the criteria you specify. Before deleting records, you may want to use Tools Database Find Records to check that the criteria select the correct records. For more information about using Tools Database Find Records, see page 243.

### To delete records

1. Select the range containing the 1-2-3 database table.
2. Choose Tools Database Delete Records.
3. Specify a criterion by doing the following:
   - Select the field from the Field drop-down box.

- Select the logical operator from the Operator drop-down box.
- Specify the value in the Value drop-down box.

For example, if you want to delete the records of everyone in the Sales department, the criterion is DEPT=Sales, where DEPT is the field, = is the logical operator, and Sales is the value.

4. To narrow the search, choose And and repeat step 3.
5. To expand the search, choose Or and repeat step 3.
6. Choose OK.

1-2-3 deletes the records that match the criteria you specified. If you delete the wrong records, you can restore them by immediately choosing Edit Undo.

## Related Help topics

You can use Tools Database Crosstab to create a crosstab table summarizing data from a 1-2-3 database table. For information about crosstab tables and an example, search on "Cross-tabulation" in Help.

You can query multiple database tables simultaneously. For information about joining two or more tables, search on " Joining database tables" in Help.

In a query table you can create an alias for a field name by entering the new field name in place of the original. You can also use Query Show Field As to specify an alias field name for 1-2-3 to display in place of a current field name in a query table. Using either method changes only the field name in the query table, not the field name in the database table. For more information, search on "Field name alias" in Help.

You can use Query Aggregate to perform calculations on groups of data from a query table. For example, you can calculate sales by salesperson, by month of sale, or by account. For more information, search on "Aggregate columns" in Help.

You can use Query Show SQL to display the SQL command equivalent for creating the current query table. You can copy this SQL statement to the Clipboard to use, for example, in macros. For more information, search on "SQL commands" in Help.

Tutorial lesson 7 gives you hands-on practice working with a 1-2-3 database. Choose Help Tutorial to start the Tutorial.

# 22 Working with External Databases

You can connect to a database table outside 1-2-3 and work with it the same as you work with a 1-2-3 database table. This chapter describes how to connect to an external database table, create an external table, send commands to an external database, and disconnect from an external table. Chapter 21 describes how to work with the data once you've brought it into 1-2-3.

## What's an external database table?

An **external database table** is a group of related records stored in a file other than a .WK4 file, such as a dBASE IV .DBF file. An external table can be on a personal computer, a network server, a mainframe, or a CD-ROM.

## Connecting to an external database table

To use 1-2-3 commands on data in an external database table, you must first connect to the table. You connect to an external database table by using Tools Database Connect to External and a DataLens driver. A **DataLens driver** is a program that 1-2-3 uses to access data in external database tables. To connect to an external database table, you must know the name of the appropriate DataLens driver and the name of the table.

*You can also open dBASE and Paradox files directly into 1-2-3. See Appendix A for more information.*

**Note** 1-2-3 includes DataLens drivers for Paradox, dBASE IV, SQL Server, and Lotus Notes. You use the 1-2-3 Install program to install the DataLens drivers that come with 1-2-3. Additional drivers may be available. For information about drivers, search on "Drivers" and choose "DataLens Drivers" in Help.

Depending on the DataLens driver you select and how it's configured, 1-2-3 may prompt you for a user ID and password. If so, enter the user ID and password in the appropriate text boxes and select OK. If 1-2-3 prompts you for a user ID and password but you don't need them to connect to the driver, just select OK.

## To connect to an external database table

1. Choose Tools Database Connect to External.

If you know the name of the driver, the external database, and the external table, you can combine steps 2 through 4 by entering the names, separated by a space, in the text box. For example, enter DBASE_IV D:\123R5W\SAMPLE\DBASE EMPLOYEE where DBASE_IV is the driver name; D:\123R5W\SAMPLE\DBASE is the database name; and EMPLOYEE is the table name.

2. Specify the driver and choose Continue.

If necessary, enter a user ID and password.

*To display database names automatically, add a database record to the registration file, LOTUS.BCF.*

3. Specify the external database or directory and choose Continue.

If 1-2-3 can locate the external databases, it displays the names in the list box. If 1-2-3 doesn't display the name of the external database you want to use, type it in the text box.

**4.** Specify the external database table and choose Continue.

**5.** Accept the default range name for the table or enter a different name in the "Refer to as" text box, and choose OK.

The range name is the name you use in 1-2-3 to refer to the external table. If you change the default name, the name of the table in the database stays the same. You use the range name, for example, in queries, database @functions, and when disconnecting from the table.

By default 1-2-3 displays the name of the external table as the range name, unless you already have a range with this name in the file. If you already used the range name in the current file, the "Refer to as" text box is blank. If this happens, enter a name of up to 15 characters in the text box.

After connecting to the external table, you can use the Tools Database and Query commands to work with the external table in the same way you work with a 1-2-3 database table. See Chapter 21 for information about using these commands.

**Help** After connecting to an external table, you can also use database @functions and macros to analyze the data. For more information, search on "Database macro commands" in Help.

## Creating an external database table

You can use 1-2-3 to create a table in an external database. To create a new external table, you model it on an existing 1-2-3 database table.

**Note** When you create a new external table from a model table, make sure the 1-2-3 file containing the model table is active.

### To create an external database table

1. Choose Tools Database Create Table.
2. Connect to the external table as described in steps 2 through 5 on page 248.
3. Specify the range that contains the model table in the Model table range text box.

4. If your DataLens driver requires or supports a table creation command, specify one in the Creation command text box.

   A table creation command specifies additional information about the table. For example, the Paradox driver lets you use a table creation command to specify a sort order for the table. Search on "Drivers" in Help for information about the creation commands you can use with these drivers.
5. To copy the records from the model table, select the "Insert records from model table" check box.
6. Choose OK.

1-2-3 creates a new table in the external database. To add records to the new table, use Tools Database Append Records. For more information, see "Appending records to a database table" on page 245.

## Sending commands to an external database

When you want to perform a task specific to a particular database, you can use Tools Database Send Command. For example, you may want to encrypt an external database table or set an index in a multiple-index file. Depending on the driver you're using, you can send driver-specific commands directly to the DataLens driver or external database.

When sending a command to an external database, you must use the syntax required by the database management system that maintains the database. 1-2-3 doesn't validate your command syntax.

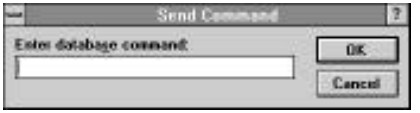
### To send a command to an external database

*To display database names automatically, add a database record to the registration file, LOTUS.BCF.*

1. Choose Tools Database Send Command.
2. Specify a driver and choose Continue.

   If the drop-down box doesn't display the driver you want, use the Install program to install the driver.
3. Specify the directory or external database and choose Continue.

   If necessary, specify a user ID and password. If 1-2-3 doesn't display the name of the external database you want, type it in the text box.




4. Enter the command.

   You can enter up to 512 characters.
5. Choose OK.

**Help** You can also use the {SEND-SQL} macro command to send SQL commands to a database. For information, search on "Database macro commands" in Help.

## Disconnecting from an external database table

Disconnecting from an external database table ends all data exchange between 1-2-3 and the external table. After you disconnect, any queries, database @functions, or macros that refer to the table will result in ERR. 1-2-3 doesn't update these queries or @functions until you reconnect to the external table. 1-2-3 reconnects when you select a cell in a query table that queries an external table and choose Query Refresh Now.

### To disconnect from an external database table

1. Choose Tools Database Disconnect.

2. Select the range name of the external database table from which you want to disconnect.
3. Choose OK.

1-2-3 disconnects from the database table you specified.

# 23 Customizing SmartIcons

SmartIcons provide a quick, simple way to do many 1-2-3 tasks. This chapter describes how to work with sets of SmartIcons, create customized icon sets, change the appearance of an icon, and assign a macro to an icon. For an overview of SmartIcons and a description of how to use them, see page 36.

**Help** For a SmartIcons reference organized by function, with a picture and description of each icon, search on “SmartIcons” in Help.

## Working with sets of SmartIcons

In addition to the default sets, 1-2-3 provides several specialized sets of SmartIcons, such as sets for editing and sets for working with macros. You can select which set you want to display; hide or show the set of SmartIcons; move the set or the SmartIcons in it; and change the display size of SmartIcons.

### To select which set of SmartIcons to display

To select the set you want to display, you can use the status bar or choose Tools SmartIcons. Use the status bar when you want to switch quickly between sets. Use Tools SmartIcons when you want to see a description of each icon in each set.

1. Do one of the following:
   - Click the SmartIcons selector on the status bar and select the icon set.

   - Choose Tools SmartIcons, select the icon set from the drop-down list, and choose OK.

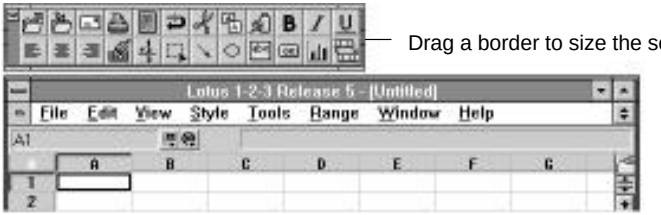
## To hide or show a set of SmartIcons

1. Do one of the following:
   - Click the SmartIcons button on the status bar and choose Hide SmartIcons or Show SmartIcons.
   - Choose View Set View Preferences; and under Show in 1-2-3, select or deselect the SmartIcons check box. Then choose OK.

## To move the set of SmartIcons

1. Choose Tools SmartIcons.
2. In the Position drop-down box, select Floating, Left, Top, Right, or Bottom.
3. Choose OK.

Selecting Left, Top, Right, or Bottom displays the SmartIcons set within the 1-2-3 window in the position you specified. If you select Floating, you can drag the SmartIcons set to any position inside or outside the 1-2-3 window, and you can manipulate the set.




## To move SmartIcons in a displayed set

You can use the mouse to rearrange the SmartIcons in a displayed set.

1. Point to the icon you want to move.
2. Hold down **CTRL** and drag the icon where you want it in the set.

   To move an icon to the end of the set, press **CTRL** and drag the icon outside the set.
3. Release the mouse button.

## To size SmartIcons

You can change the display size of SmartIcons.

Medium

Large

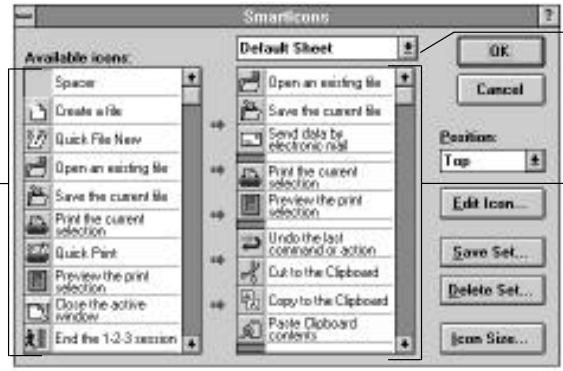
1. Choose Tools SmartIcons.
2. Choose Icon Size.
3. Select Medium or Large.
4. Choose OK.

## Creating and modifying sets of SmartIcons

You can modify any set of SmartIcons, your own sets or the default sets. The set that 1-2-3 displays by default depends on the current selection. You can modify sets of SmartIcons by moving, adding, removing, and grouping icons. You can also customize and name your own icon sets. For example, you can create a set called SpecialSet that contains only the icons you use most frequently.

### To create or modify sets of SmartIcons

1. Choose Tools SmartIcons.
2. Select the SmartIcons set you want to modify or use as the basis for a new set.




3. To modify the selected icon set, do one or more of the following:
   - To add an icon to the selected icon set, drag it from the Available icons list box to the position you want in the selected set and release the mouse button.
   - To remove an icon from the selected set, drag it outside the list box and release the mouse button.
   - To move an icon in the selected set, drag the icon to the position you want and release the mouse button.
   - To group icons in the selected set, move them into the order you want. Then drag a spacer icon from the Available icons list box to the position you want in the selected set and release the mouse button. Repeat this as many times as you want to separate groups of icons.
4. To save your changes as a new icon set, choose Save Set; enter a name in the Name of set text box; accept the default file name or enter a new file name in the File name text box; choose OK.

1-2-3 saves the new set and adds it to the list of sets. 1-2-3 stores the new set in a file using the file name you specified and the extension .SMI.

5. Choose OK.

1-2-3 also saves changes you made to any existing sets.

### To delete a set of SmartIcons

1. Choose Tools SmartIcons.
2. Choose Delete Set.
3. Select the set or sets you want to delete.
4. Choose OK.

   1-2-3 deletes the selected sets and redisplays the SmartIcons dialog box.
5. Choose OK.

## Customizing icons

You can assign a macro to an icon and create your own bitmap for the icon. For example, you can create a macro that enters your company name in a special style in the worksheet. Then you can create an icon with your company logo on it and assign the macro to this new icon. For information about creating a macro, see Chapter 24.

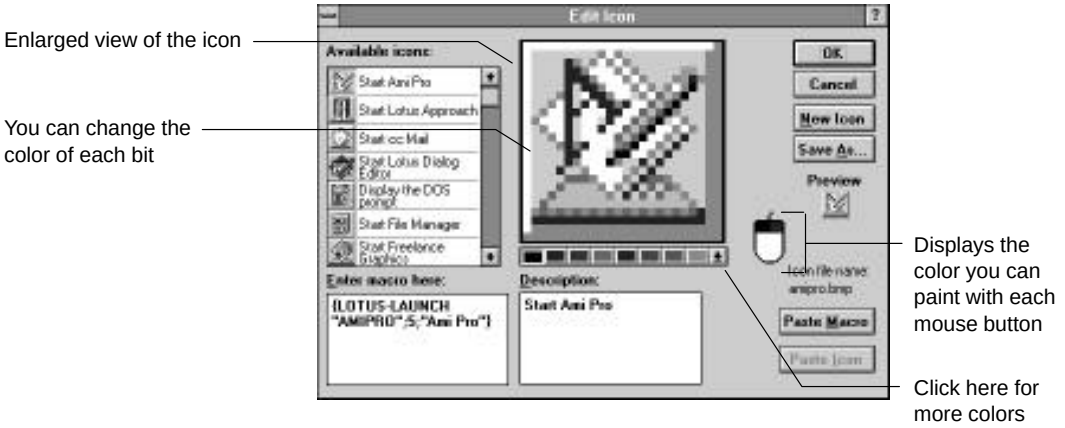
To create the bitmap for your icon, you can

- Copy the bitmap of an existing icon and edit it
- Start with a blank button and paint your own bitmap
- Copy a bitmap to the Clipboard from another application, such as Paintbrush, and paste it into a blank icon

**Note** You must use the mouse to change the appearance of an icon.

### To change the appearance of an icon

1. If you plan to paste a bitmap into a blank button, copy the bitmap to the Clipboard.
2. Choose Tools SmartIcons.
3. Choose Edit Icon.




**4.** To start with a blank icon, choose New Icon.

1-2-3 prompts you to enter a file name for your custom icon and, after you choose OK, displays an enlarged view of a blank icon.

**5.** To paste a bitmap from the Clipboard, choose Paste Icon.

**6.** To copy an existing icon so you can edit the bitmap, select the existing icon from the Available icons list box and choose Save As.

1-2-3 prompts you to enter a file name for your custom icon and, after you choose OK, displays an enlarged view of a copy of the existing icon.

**Caution** If you edit the original bitmap of a custom icon, you change the icon's appearance permanently.

**7.** To paint a blank icon or modify a copy of the bitmap for an existing icon, click a color in the color bar with either mouse button, and then click the bits you want to paint in the enlarged view.

1-2-3 changes the color of the bits and updates the Preview icon.

**8.** Choose OK.

1-2-3 displays the new icon at the bottom of the Available icons list in the SmartIcons dialog box. You can add the new icon to any icon set, as described in "To create or modify sets of SmartIcons" on page 255.

**9.** Choose OK.

1-2-3 saves your icon as a .BMP file.

## To assign a macro to an icon

1. If you plan to assign an existing macro to your custom icon, copy the macro to the Clipboard.

   You can copy a macro to the Clipboard from the Transcript window or from the worksheet.
2. Choose Tools SmartIcons.
3. Choose Edit Icon.

Enter icon description here

Enter macro commands here

4. From the Available icons list box, select the icon to which you want to assign the macro.
5. Assign the macro to the icon in any of the following ways:
   - Choose Paste Macro to paste a macro from the Clipboard into the "Enter macro here" text box.
   - Type the macro in the "Enter macro here" text box.
   - Enter {BRANCH *macroname*} in the "Enter macro here" text box.

     Use this method to assign a longer macro to an icon, where *macroname* is the name of a macro in a worksheet. In order for this macro to run when you click the icon, the file containing the macro must be active.
6. If you want a description to appear next to the icon in the dialog box, enter it in the Description text box.

   This description also appears next to the icon when you point to an icon in a displayed set and hold the pointer in place.
7. Choose OK.

   1-2-3 displays the new icon at the bottom of the Available icons list in the SmartIcons dialog box. You can add the new icon to any icon set, as described in "To create or modify sets of SmartIcons" on page 255.
8. Choose OK.

# 24 Using Macros to Automate Your Work

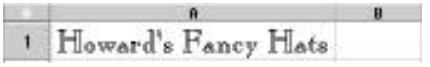
You can create macros to do 1-2-3 tasks automatically. The 1-2-3 macro language has more than 300 macro commands. Many of these commands automate menu choices and mouse or keyboard actions. Other macro commands perform programming functions such as branching and calling subroutines. This chapter describes how to plan, create, name, run, debug, and save a macro.

**Help** Help provides detailed information about each macro command. To browse through macro commands by category, search on "Macros" in Help, and select the topic "Macro Command Categories."

## What is a macro?

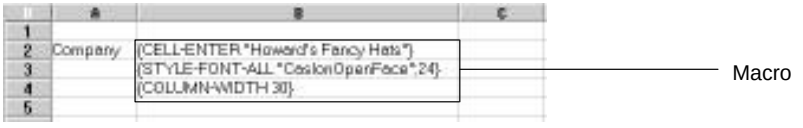
A **macro** is a series of commands that automates a 1-2-3 task. You can use macros to automate repetitive tasks, streamline complex procedures, and create applications based on 1-2-3.

Suppose you often have to enter your company name and style it as shown below.




Instead of repeating this task, you can do it once and record it as a series of macro commands. Then you can create a macro from the recorded commands. Whenever you want to enter the company name, you run the macro.

The macro below, named Company, automates the task of entering and styling the company name. It was created from recorded macro commands.



## Summary of how to create a macro

This section summarizes the steps for creating and running a macro. The sections that follow describe each step in detail.

1. Plan the macro.

   You can save time and prevent errors by planning what you want a macro to do and knowing all the steps needed to accomplish the task.

2. Decide where to enter the macro.

   You can enter a macro in a worksheet file with other data or in a **macro library**, a worksheet file that contains only macros.

3. Create the macro commands.

   You can record macro commands or write them yourself. You can also edit recorded macro commands and combine them with commands you write yourself.

4. Name the macro.

   You name a macro by giving it a range name.

5. Save the macro.

   You save a macro by saving the file that contains the macro.

6. Run the macro.

   You can run a macro using menu commands, keyboard shortcuts, a macro button, SmartIcons, or the macro transcript.

7. Debug the macro.

   You debug a macro if it doesn't do what you expected. **Debugging** is the process of finding and correcting errors in macro syntax and logic.

8. Document the macro.

   You document a macro so that you and others can remember the macro name and what the macro does.

9. Save the macro again.

## Planning a macro

The first step in planning a macro is to determine what you want the macro to do. Before recording a macro, jot down all the menu commands and other mouse and keyboard actions you need to perform.

If you're writing a macro yourself, or combining recorded commands with commands you write yourself, consider creating a

flow chart to map out the order and logic of the steps in the task. A flow chart can help you determine which steps to record and which to write yourself.

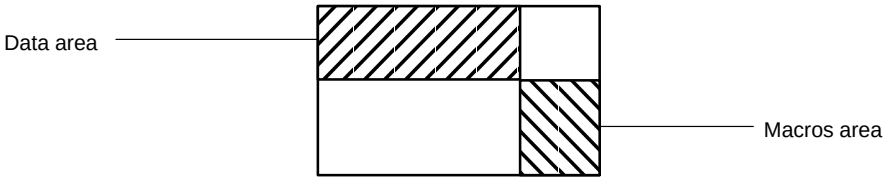
## Deciding where to enter a macro

You can enter a macro in a worksheet file with other data or in a **macro library**, a worksheet file containing only macros.

### Entering a macro with other data

If you use a macro with only one file, it's simplest to enter the macro in that file. When you enter macros, avoid writing over other data in the file. When you insert or delete rows and columns of data in the file, avoid writing over your macros. To keep your data and your macros intact, follow these guidelines:

- Put macros in a separate worksheet rather than in a worksheet containing other data. You can name the worksheet to make it easy to find.
- If you want to put macros and other data in the same worksheet, put the macros below and to the right of the data area. If you don't, inserting or deleting rows or columns in the data area may damage your macros.




If you put macros and other data in the same worksheet, name a cell at the beginning of the macros area with a range name such as Macros. This makes it easy to move between the macros area and the data area.

### Entering a macro in a macro library

If you use a macro with several files, you can store the macro in a macro library. You can organize a macro library by using a separate worksheet for each group of related macros.

The macro library file must be loaded into memory when you run a macro stored there. For example, suppose that the Company macro is stored in a macro library named MACROLIB.WK4. To enter the company name in a file called SALESREPS, MACROLIB must be loaded into memory and SALESREPS must be the current file.

## Creating macro commands

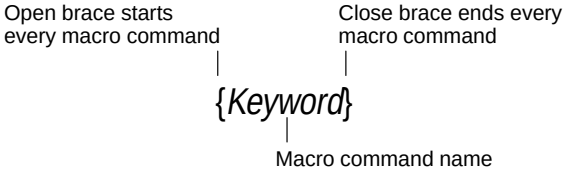
To create the commands in a macro, you can write them from scratch or use recorded commands. You can record keystrokes, menu choices, and mouse actions as a series of macro commands in the **Transcript window**.

Some macro commands have no equivalent menu choices or mouse actions. Since you can't record these commands, you must write them yourself. For example, you'll often write {*subroutine*}, {IF}, and {BRANCH} commands to direct the flow of control in a macro.

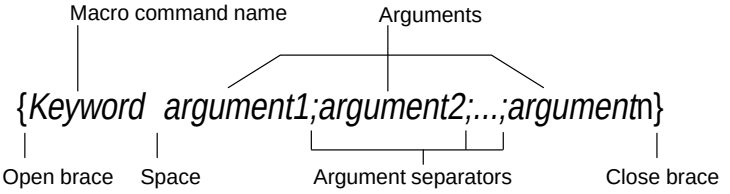
Often the most efficient way to create macro commands is to edit recorded commands and combine them with commands you write yourself. All 1-2-3 macro commands have a structure, or **syntax**. When you write a macro yourself or edit recorded commands, you must use the correct syntax, or the command won't work. This section describes the syntax and rules for creating macro commands.

## Macro command syntax

The illustration below shows the syntax for a macro command with no arguments.




The next illustration shows the syntax of a macro command with arguments.




The first word in a macro command is the **keyword**, the macro command name. The keyword tells 1-2-3 what action to perform.

*argument1*, *argument2*, and *argument*n represent required and optional arguments. You must include required arguments; you can omit optional arguments. **Arguments** supply information that 1-2-3 needs to complete the command. In the documentation, optional arguments are enclosed in [ ] (brackets).

When you use more than one argument with a command, you separate the arguments with an **argument separator**, such as ; (semicolon), the default argument separator. You leave no spaces between arguments.

1-2-3 doesn't check the syntax of a macro command until you run the macro containing the command. When you run a macro containing incorrect syntax, 1-2-3 displays a message with the name and location of the incorrect command. You can use this information to debug the macro. For more information, see "Debugging a macro" on page 276.

## Arguments

Macro commands use four types of arguments: values, text, locations, and conditions.

A **value argument** is a number, a numeric formula, or the range name or address of a cell that contains a number or numeric formula. The following command uses the value argument 24 to assign a point size of 24 to cell A5.

{STYLE-FONT-SIZE 24;A5}

A **text argument** is any sequence of characters including letters, numbers, and symbols, enclosed in " " (quotation marks); a text formula; or the range name or address of a cell that contains a label or text formula.

For some macro commands that use a text argument, you can specify any text. When you enclose this text in quotation marks, 1-2-3 uses the text exactly as you specified it. For example, the following command enters HI, THERE in the current cell.

{CELL-ENTER "HI, THERE"}

For other commands that use a text argument, you must use specific text. For example, the {STYLE-ALIGN-VERTICAL} command aligns data vertically in a range. For the *alignment-style* argument, you can specify the text "TOP", "CENTER", or "BOTTOM", but no other text. The following command top-aligns data vertically in the range A5..B10.

{STYLE-ALIGN-VERTICAL "TOP";A5..B10}

A **location argument** is a range name or address, or any formula that evaluates to a range name or address. Usually, these locations are in the current file or in another active file. Some commands can also use a location that refers to a range in a file on disk.

The command below uses two location arguments. This command copies the contents of the range DEBTS from the BUDGET file on disk to the rows immediately below the range TARGET in the current file. It expands Target to include the copied data.

{APPENDBELOW TARGET;<<BUDGET>>DEBTS}

**Caution** For location arguments, it's best to use range names rather than addresses. This ensures that the locations are correct even if you insert or delete rows, columns, or worksheets, or move ranges in the file.

Often you use location arguments in macro commands that redirect the flow of control, such as {BRANCH}. In these commands, 1-2-3 interprets the locations to be in the worksheet or file that contains the macro, unless you specify the name of another file. For all other macro commands, 1-2-3 interprets locations to be in the current worksheet in the current file.

To refer to another worksheet in a location argument, you must precede the address with a worksheet letter or worksheet name. To refer to another file, you must precede the address or range name with a **file reference**, the name of the file enclosed in << >> (two left angle brackets and two right angle brackets).

For example:

- {BRANCH A21} redirects the flow of control to cell A21 in the worksheet containing the macro.
- {BRANCH Chicago:A21} redirects the flow of control to cell A21 in the worksheet named Chicago in the file containing the macro.
- {BRANCH <<BUDGET>>C:A21} redirects the flow of control to cell A21 in worksheet C in the file BUDGET.
- {CELL-ENTER "Hello";A21} enters the text Hello in cell A21 in the current worksheet in the current file.
- {CELL-ENTER "Hello";B:A21} enters the text Hello in cell A21 in worksheet B in the current file.
- {CELL-ENTER "Hello";<<BUDGET>>B:A21} enters the text Hello in cell A21 in worksheet B in the file BUDGET.

**Help** For more information about the flow-of-control macro commands, search on "Flow-of-control macro commands" in Help.

A **condition argument** is an expression that 1-2-3 evaluates as true or false. A condition argument can be

- A logical formula using one of the logical operators <, >, =, < =, > =, < >, #AND#, #NOT#, and #OR#
- One of the @functions @TRUE, @FALSE, @ISERR, @ISNA, @ISNUMBER, @ISRANGE, or @ISSTRING
- Any number or numeric formula; text or text formula; an address or range name; a blank cell; or a cell containing the value NA or ERR

For example, the command below uses the logical formula VAL<100 as a condition argument. This command continuously recalculates each cell in the range PAYMENT, column by column, until the value in cell VAL falls below 100 or the number of recalculations equals 50.

{RECALCCOL PAYMENT;VAL<100;50}

The command below uses cell A1 as a condition argument. If this cell contains either a logical formula that results in true, or any other entry that 1-2-3 evaluates to true, 1-2-3 performs the commands in the same cell as the {IF} command. Otherwise, 1-2-3 skips the {BEEP} and {QUIT} commands and performs the {LET} command in the next cell down the column. This command puts the text YOU'RE CORRECT in cell A5.

| |
|---|
| {IF A1}{BEEP}{QUIT} |
| {LET A5,"YOU'RE CORRECT"} |

## Argument separators

When a macro command has two or more arguments, you use argument separators to separate each argument from the one that follows. The ; (semicolon) is always a valid argument separator. Using semicolon as your argument separator ensures that your macros are portable and will work in any country. In addition, you can choose Tools User Setup International Style and specify , (comma) or . (period) as a valid argument separator.

## Rules for writing macro commands

When you edit recorded macro commands or write macro commands yourself, you should observe the following rules.

- When you enter macro commands in a worksheet, enter them as text in consecutive cells in a column.

  You can enter more than one command in a cell, up to 512 characters. In most cases, however, it's better to enter one command per cell. This makes the macro easier to read and

debug. Some commands, such as the {IF} command, must be followed by at least one more command in the same cell.

Macro commands entered one per cell

```
{SELECT A:B2}
{INSERT-SHEETS "AFTER":1}
{COLUMN-WIDTH 30}
{QUIT}
```

The same macro commands entered all in one cell

```
{SELECT A:B2}{INSERT-SHEETS "AFTER":1}{COLUMN-WIDTH 30}{QUIT}
```

- Start and end a macro command in the same cell.

| Correct | Incorrect |
|---|---|
| {CONTENTS REPORT;INCOME;12;117} | {CONTENTS REPORT;<br>INCOME;12;117} |

- Start a macro command with an { (open brace), and end it with a } (close brace).
- Type the keyword immediately after the open brace, leaving no spaces before the keyword or in the keyword.

  Many macro commands have a hyphenated multi-word keyword. Don't put any spaces between the hyphenated words, and don't use underscores instead of hyphens. You can type the keyword in any combination of uppercase and lowercase letters.
- If you include arguments in the command, separate the keyword from the first argument with one space. If you include no arguments in a command, include no spaces.
- Don't include any spaces in the command, other than the space between the keyword and the first argument and spaces that are part of text enclosed in "" (quotation marks).

This command has a text argument with spaces as part of the argument

```
{GET-LABEL "Type your first name, please: ":FIRST}
{QUIT}
```

This command has no arguments; thus, no spaces

- If a command includes two or more arguments, use an argument separator to separate each argument from the one that follows.
- If you omit an optional argument between two other arguments, enter an argument separator as a placeholder.

  For example, the {CONTENTS} command shown on the following page takes four arguments. The first two arguments are required, and the last two are optional.

Both optional arguments omitted at the end of the command; no argument separators needed

```
{CONTENTS REPORT:INCOME}
```

Argument separator takes the place of the omitted optional argument; 117 is the fourth argument

```
{CONTENTS REPORT:INCOME:117}
```

- In text arguments enclose literal text in quotation marks.

  1-2-3 assumes that text not enclosed in quotation marks is a range name used as a location argument, rather than literal text.

```
{INDICATE "DATABASE MACRO"}
{BRANCH INTEREST}
```

Text argument, enclosed in quotation marks

Range name location argument, not enclosed in quotation marks

  To enter a quotation mark within text already enclosed in quotation marks, type *two* quotation marks. For example, to make a macro display the text Now using a "Database" Macro, use the following command:

  {INDICATE "Now using a "" Database"" Macro"}

- End a macro with a blank cell or a {QUIT} command.

```
{SELECT A:B2}
{INSERT-SHEETS "AFTER",1}
{COLUMN-WIDTH 30}
{QUIT}
```

1-2-3 stops performing this macro at the {QUIT} command

```
{SELECT A:B2}
{INSERT-SHEETS "AFTER",1}
{COLUMN-WIDTH 30}
```

1-2-3 stops performing this macro at a blank cell

## To write a macro command yourself

1. Select the cell where you want to enter the macro command.
2. Type {
3. Press **F3 (NAME)**. The Macro Keywords dialog box appears.
4. If you know the category of the macro command you want, select the category from the Category drop-down box.

   The Macro Keywords list box displays macro commands in the category that you selected.
5. Select the command from the Macro Keywords list box.
6. Choose OK.

   1-2-3 enters the macro keyword, placeholders for required and optional arguments, and argument separators.
7. Replace the placeholders for required and optional arguments with your actual arguments.

8. Click the Confirm button, or press **ENTER**.

## Recording a macro

You can create many useful macros by recording macro commands in the Transcript window and copying them into a worksheet, a macro button, or an icon. This section describes how to record a macro, edit macro commands in the Transcript window, and copy a recorded macro.

When you record a macro, each command appears in the Transcript window. Your most recent actions appear as macro commands at the bottom of the window. Commands for less recent actions appear at the top. When the transcript is full, 1-2-3 discards the commands at the top, your least recent actions.

When you quit 1-2-3, all macro commands in the transcript are lost. To save recorded macro commands, you must copy them from the Transcript window and paste them into a worksheet, a macro button, or an icon.

### To clear the Transcript window

Before recording macro commands, it's a good idea to clear the Transcript window of any previous commands. This makes it easy to find the commands you want.

1. Choose Tools Macro Show Transcript.
2. Make the Transcript window active.
3. Choose Edit Clear All.

### To record a macro

Macro recording is off by default. Once you turn on recording, it stays on in the current 1-2-3 session until you turn it off.

1. Choose Tools Macro Record.
2. Perform the task you want to record.

   For example, choose commands, enter data, and move around in the worksheet, the file, or between files and other open windows.

## To edit commands in the Transcript window

*You can also edit recorded macro commands after you've copied them into a worksheet, a macro button, or an icon.*

1. Make the Transcript window active.
2. Edit the macro commands by using the Edit commands and typing directly into the Transcript window.

You often have to edit a macro command to make it work on the current selection rather than on the particular range that 1-2-3 recorded. For example, when you widen column B to 25 characters, 1-2-3 records this action as the following macro command:

{COLUMN-WIDTH 25;B:A1}

You can edit this recorded command to make it widen the column containing the current cell. Just remove the optional location argument, B:A1, as shown below.

{COLUMN-WIDTH 25}

## To copy a recorded macro

1. Choose Tools Macro Show Transcript.
2. Select the macro commands you want to copy.

3. Choose Edit Copy.
4. Do any of the following:
   - To paste the macro into a worksheet, click a cell, and choose Edit Paste.
   - To paste the macro into a button, **CTRL+** click or **SHIFT+** click the button to select it, choose Tools Macro Assign to Button, select the "Enter macro here" text box, and press **CTRL+V**.
   - To paste the macro into an icon, choose Tools SmartIcons, choose Edit Icon, and choose Paste Macro. For more information, see page 258.

If you paste a recorded macro into a worksheet, name the range that contains the macro, as described in "Naming a macro" on the next page. For information about creating a macro button, see "Working with a macro button" on the next page.

## Naming a macro

1-2-3 accepts the following types of macro names:

- A **backslash name** consists of a \ (backslash) followed by a single letter; for example, \d. To run a macro with this type of name, you press **CTRL+** the letter. Naming a macro \0 (zero) creates an autoexecute macro that runs automatically every time you open or retrieve the file. For more information, see "Using autoexecute macros" on page 275.
- A **multiple-character name** is an ordinary range name. This type of name is convenient for indicating what the macro does. If you try to run a range-name macro and macros with the same name exist in two or more active files, 1-2-3 runs the macro in the current file. You run a range-name macro with **ALT+F3 (RUN)** or Tools Macro Run.

  **Note** If you use \ (backslash) *a letter* to name a macro and this letter corresponds to a keyboard shortcut using **CTRL+** *a letter*, the macro overrides the keyboard shortcut. For example, if you name a macro \e, this macro overrides the keyboard shortcut for center-aligning the current selection, **CTRL+E**.

  When naming your macros, be careful not to use names that duplicate 1-2-3 macro commands or keynames. For example, if you name a macro {PRINT} and later try to use the 1-2-3 {PRINT} macro command, 1-2-3 will run your macro and not the 1-2-3 {PRINT} macro.

To name a macro, name the first cell of the macro using the Range Name command. You name macro subroutines, branch locations, and data used by macro arguments the same way that you name a macro. Macro names follow all the rules for range names. For more information, see "Naming ranges" on page 93.

## Working with a macro button

You can make a macro button on a worksheet and assign a macro to run when you click the button. You can store the assigned macro in the button or in a range. Storing the macro in the button is convenient for running short recorded macros or simple macros that you write yourself. Referring to a macro range name or address in the button is convenient for running longer, more complex macros that use subroutines, loops, and branches.

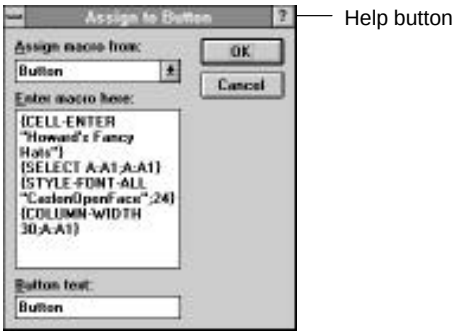
**Help** For more information about assigning a macro range name or address to a button, search on “Assigning a macro to a button” then “Assign to Button” in Help.

You can also assign a macro to an icon and run the macro by clicking an icon. For more information about assigning a macro to an icon, see page 258.

## To make a macro button from the Transcript window

1. After recording macro commands, make the Transcript window active.
2. Select the commands in the Transcript window that you want to assign to the button.
3. Choose Transcript Make Button.
4. Move the mouse pointer to the place in the worksheet where you want the macro button to appear.
5. Do one of the following:
   - Click to create the macro button in the default size.
   - Drag across the worksheet and release the mouse button when the macro button is the size you want.

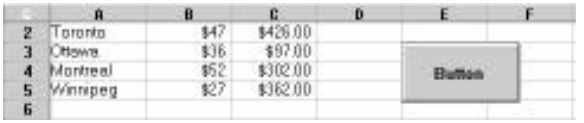
   1-2-3 places the button on the worksheet and then opens the Assign to Button dialog box.




6. To replace the default label “Button” with a more descriptive name, enter the label in the “Button text” text box.

   It’s a good idea to name the button with a name that reminds you of what the macro does.

You see the button with the macro assigned to it in the worksheet.




To modify the button, **CTRL+** click or **SHIFT+** click it to select it and choose Tools Macro Assign to Button. You can also point to the button, click the right mouse button, and choose Assign Macro.

## Running a macro

When you run a macro, 1-2-3 performs the task that the macro automates. You can run a macro when the file containing the macro is in memory and 1-2-3 is in Ready mode. If you try to run a range-name macro and macros with the same name in two or more active files, 1-2-3 runs the macro in the current file.

### To run an unnamed macro

1. Select the first cell of the macro.
2. Press **ALT+F3 (RUN)** or choose Tools Macro Run.
3. Choose OK.

### To run a backslash macro

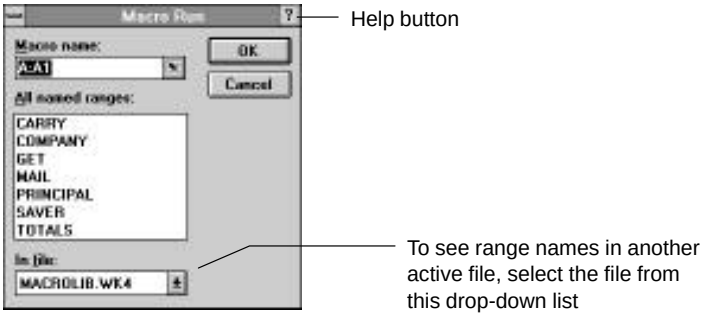
1. Press **CTRL** and the single-letter name simultaneously.

   For example, to run a macro named \a, press **CTRL+A**. 1-2-3 runs the macro.

   **Note** You can also run a backslash macro with **ALT+F3 (RUN)**. See "To run a range-name macro" below.

### To run a range-name macro

1. Move the cell pointer to the worksheet area that you want the macro to act on.
2. Press **ALT+F3 (RUN)** or choose Tools Macro Run.




3. Select the macro name from the All named ranges list box or enter the macro name or address in the Macro name text box.
4. Choose OK.

### To run a macro with a button

1. Make sure the worksheet containing the button is the current worksheet.
2. If necessary, move the cell pointer to the worksheet area that you want the macro to act on.
3. Click the button.

### To run macro commands from the Transcript window

You can run macro commands directly from the Transcript window. Playing back macro commands from the Transcript window is useful when you want to repeat something you just did, but don't want to save the macro commands. It's also a way to test macro commands before copying them into a worksheet.

1. Move the cell pointer to the worksheet area that you want the macro to act on.

2. Choose Tools Macro Show Transcript.
3. Select the block of macro commands that you want to run.
4. Choose Transcript Playback.

## Stopping a macro

Most macros run for a few seconds and then end. Large macro applications, however, can run much longer. While a macro is running, you can't do anything else in 1-2-3. For this reason, you may sometimes want to stop a macro while it's running.

**Note** You can't stop a macro that contains a {BREAKOFF} command. The {BREAKOFF} command prevents users from

stopping a macro; the {BREAKON} command restores the ability to stop a macro. These commands are useful when you're creating an interactive macro for other users and don't want them to be able to stop the macro.

## To stop a macro

1. Press **CTRL+BREAK** while the macro is running.

   Unless the macro contains a {BREAKOFF} command, 1-2-3 stops the macro after it completes the current command, and displays a message.

2. Press **ESC** or choose OK to clear the message and return to Ready mode.

After you stop the macro, you can resume working with 1-2-3.

## Recalculating during a macro

Whether or not 1-2-3 recalculates data while a macro is running depends on the recalculation setting in the most recently-opened file.

- When you run a macro with recalculation set to Manual, 1-2-3 recalculates formulas only when it encounters a {CALC}, {RECALC}, or {RECALCCOL} command in the macro; or when you press **F9 (CALC)** during an interactive macro.
- When you run a macro with recalculation set to Automatic, 1-2-3 recalculates formulas automatically whenever a command in the macro changes data in the file.

In general, macros run faster with recalculation set to Manual. When recalculation is set to Manual, however, a macro may produce inaccurate results if the macro changes data and then uses the result of a formula that depends on that data. You can avoid inaccurate results by putting a {CALC}, {RECALC}, or {RECALCCOL} command in the macro at any point where data is likely to change.

The following macro commands change data but don't cause an automatic recalculation, even with recalculation set to Automatic: {ALERT}, {CHOOSE-FILE}, {CHOOSE-ITEM}, {CHOOSE-MANY}, {CHOOSE-ONE}, {CONTENTS}, {DEFINE}, {DIALOG}, {FILESIZE}, {FOR}, {GET}, {GET-FORMULA}, {GET-LABEL}, {GET-NUMBER}, {GET-RANGE}, {GETPOS}, {LET}, {LOOK}, {PUT}, {READ}, {READLN}, {SET}.

Instead of recalculating data immediately after performing one of these commands, 1-2-3 defers recalculation until any of the following happens:

- You press **ENTER** or a pointer-movement key
- A macro command equivalent to **ENTER** or a pointer-movement key occurs in the macro
- A {CALC}, {RECALC}, or {RECALCCOL} occurs in the macro

### To set recalculation

1. Choose Tools User Setup.
2. Choose Recalculation.
3. Under Recalculation, select Automatic or Manual.
4. Choose OK.
5. Choose OK again to close the User Setup dialog box.

## Using autoexecute macros

An **autoexecute macro** is a macro that runs automatically when you open the worksheet file that contains the macro. You create an autoexecute macro by naming it \0 (backslash zero). 1-2-3 runs autoexecute macros when the “Run autoexecute macros” check box in the User Setup dialog box is checked.

The result of certain macros depends on the autoexecute setting. For example, suppose a macro contains a {FILE-OPEN} command that opens a file containing an autoexecute macro.

- If “Run autoexecute macros” is checked, 1-2-3 opens the file and runs the autoexecute macro, but doesn’t resume running the original macro.

  If you open multiple files at once, 1-2-3 only runs the autoexecute macro in the last file opened that contains an autoexecute macro.
- If “Run autoexecute macros” isn’t checked, 1-2-3 opens the file and continues running the original macro, but doesn’t run the autoexecute macro.

## Debugging a macro

Sometimes, when you first run a macro, it doesn't do what you expect, or 1-2-3 displays a message. When a macro doesn't run correctly, you have to debug it. It's a good idea to save your macros before you run them for the first time. You save a macro by saving the file that contains the macro.

You can correct obvious errors of spelling or typing by editing the macro commands just as you edit any cell entry. When a macro results in a message, it's usually because of incorrect syntax. The message tells you the name and location of the incorrect command.

When debugging a macro, check for the following common errors:

- Spelling errors, including incorrect spelling of keywords, such as {WINDOWOFF} instead of {WINDOWSOFF}; or misspellings of range names, such as Proft instead of Profit
- Omitting a hyphen in a hyphenated macro keyword, or putting in an extra hyphen in a hyphenated keyword
- Using an underscore instead of a hyphen in a macro keyword
- Missing braces around a command
- Enclosing a command in parentheses or square brackets instead of braces
- Spaces where there shouldn't be any, such as between the { (open brace) and the keyword in a macro command; between arguments; in an @function within a command; in a range name; before or after a hyphen in a hyphenated keyword, or as the last character in a cell
- Missing required arguments
- Missing or misplaced argument separators, when you intentionally omitted an optional argument between two other arguments
- Using an invalid argument separator
- Arguments of the wrong type; for example, a text argument where 1-2-3 expects a number
- Incorrect cell or range references; for example, a reference to a nonexistent range or to a range name that's no longer associated with a range
- Range names or addresses without worksheet letters or file references, when you need these to specify a location argument
- Macro names or subroutine names that duplicate macro keywords, such as Quit, Return, or Query

- Missing quotation marks around text arguments that must be enclosed in quotation marks; for example, {CELL-ENTER Rates; Caption} instead of {CELL-ENTER “Rates”; Caption}
- Omitting a {CALC} command after a macro command that changes data; this can cause formulas to have unreliable results
- A blank cell or a cell containing a value, which ends the macro before you meant it to end

## To use Step mode and Trace

When you can’t find any obvious errors of typing, spelling, or syntax, you can debug the macro using Step mode and Trace. These are debugging tools that are most effective when you use them together to examine a macro as it runs.

Using Step mode, you can run a macro one command at a time. Trace opens the Macro Trace window which displays the macro command that 1-2-3 is about to perform. As you run the macro step by step, if there’s an error, the Macro Trace window shows the command that caused the error.

1. Choose Tools Macro Single Step or press **ALT+F2 (STEP)**.

   1-2-3 displays the Step indicator in the status bar.

2. Choose Tools Macro Trace.

   1-2-3 displays the Macro Trace window.

The address of the current macro command

The current macro command

3. Run the macro.

   For more information about running a macro, see page 272.

4. Press any key to execute one command at a time until you find the command that caused the error.

   The Macro Trace window shows you the current location and the macro command that 1-2-3 is currently performing.

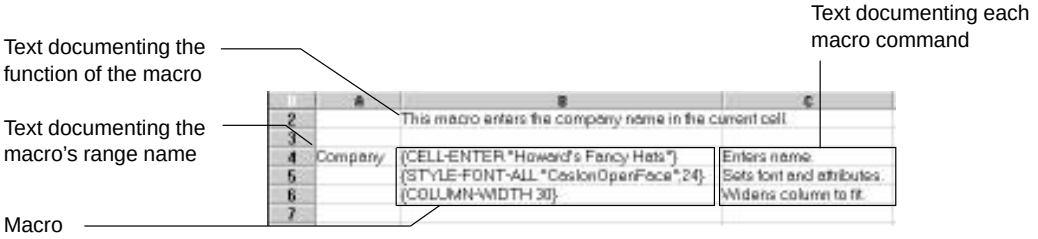
When you find the error, end the macro by pressing **CTRL+BREAK** and then **ESC** or **ENTER**. Step mode and Trace are still on, and 1-2-3 still displays the Step indicator and the Macro Trace window. You don’t need to turn Step or Trace off before editing the macro to correct it.

Edit the command where the error occurred. After you edit the macro, run through it again step by step to check that there are no other problems.

When you finish debugging and editing the macro, press **ALT+F2 (STEP)** or choose Tools Macro Single Step to turn Step mode off. To close the Macro Trace window, choose Tools Macro Trace again.

## Documenting a macro

After a macro runs correctly, it's a good idea to document it. Documenting a macro is helpful when you or someone else is revising the macro, or when you're trying to remember what it does long after you last used it. The illustration below shows a fully documented macro.




*When entering a backslash name, type a label-prefix character ('," or ^) before entering the name so 1-2-3 won't interpret the backslash as the repeating text label-prefix character.*

Document the macro name by entering a label in the cell to the immediate left of the macro's first cell. If you use a multiple-character label, choose one that describes the macro's function. You can also document the function of the macro by typing a brief description in the rows above the macro. To document macro commands or subroutines, type a description in the cells to the immediate right of the commands.

## Saving a macro

You save a macro the same way you save any other worksheet data: save the file containing the macro. You can save a file by choosing File Save or File Save As. For more information, see "Saving a file" on page 66.

## Learning about each macro

Help provides detailed information about each of the more than 300 macro commands. The *User's Guide* doesn't list individual macro commands.

### To find information about a macro

*If you know the name of the macro that you want more information about, type* **{** *followed by the macro keyword, and press* **F1 (HELP)**.

1. In an empty cell, type {
2. Press **F3 (NAME)**.

   The Macro Keywords dialog box appears, containing an alphabetical list of all macro keywords grouped by category.
3. Find the macro you want either by typing in the list box or scrolling through the list.
4. Select the macro you want to learn about and press **F1 (HELP)**.

1-2-3 displays a Help topic with detailed information about the macro including syntax, arguments, notes, and examples. To print the Help topic, choose File Print Topic in the Help window.

You can also search on individual macro commands in Macro Help. To open Macro Help, choose Help Contents, select "Macros," then select "Descriptions of Individual Macro Commands."

## Related Help topics

You can use the Lotus Dialog Editor to create and edit custom dialog boxes, and you can use the {DIALOG} macro to display these dialog boxes in 1-2-3. For more information, open the Dialog Editor application and choose Help Contents.

Info components contain information about the current 1-2-3 session. Each info component contains the current value of a setting that controls the appearance or behavior of 1-2-3. When you omit an optional argument in a macro command, 1-2-3 often uses the current value of an info component in place of the omitted argument. For a description of every info component, choose "Macros" in the 1-2-3 Release 5 Help Contents window, and select "Info components."

# 25 Using 1-2-3 with Other Applications

You can transfer data between 1-2-3 and other Windows applications by sending mail, creating DDE and OLE links, and performing OLE embedding. This chapter describes how you can use 1-2-3 to work with other Lotus and Windows applications.

## Using mail

Mail is an easy way to send data for use in 1-2-3 and other applications. You can use File Send Mail to send a range, chart, map, drawn object, or an entire file as an electronic mail message. To do this, you need Lotus Notes Release 2.1 for Windows or later, or Lotus cc:Mail™ Release 1.11 for Windows or later. You can also use File Send Mail with other mail applications that use the Vendor-Independent Messaging Interface (VIM®), and with Microsoft Mail running under Windows for Workgroups Version 3.1.

If you use Lotus Notes or cc:Mail and the mail application is open, 1-2-3 notifies you when you get new mail by beeping and displaying an envelope in the status bar. Click the envelope to go to your mail application.

You can also send a range of worksheet data that other users can work with. See “To send a range” for more information.

### To send mail from within 1-2-3

1. Choose File Send Mail.
2. Choose whether to send a message only, the entire file, or a selected range.
3. Choose OK.

A dialog box for sending mail from your mail application appears. After you use the dialog box to send a mail message, you return to 1-2-3.

## To attach a file to a mail message

1. Make the file you want to attach the current file.
2. Choose File Send Mail.

   The dialog box that appears depends on whether you changed the file since you last saved it or never saved it.
3. Select the Save and attach file or the Attach file option button.
4. Choose OK.

If you haven't modified the file, the dialog box from your mail application appears. If you have modified the file, 1-2-3 automatically saves it, and then the dialog box from your mail application appears. If you never saved the file, the File Save As dialog box appears so you can name the file; then the dialog box from your mail application appears.

## To insert a selection in a mail message

1. Select the range, chart, or drawn object you want to include in the mail message.
2. Choose File Send Mail.
3. If your selection is a range, select the "Send as picture" check box.

   Otherwise, 1-2-3 sends the range as worksheet data. See "To Send a range" below.
4. Choose OK.

A dialog box for sending mail from your mail application appears. After you use the dialog box to send a mail message, you return to 1-2-3.

## To send a range

You can send a range of worksheet data to other mail-enabled 1-2-3 Release 5 users.

You can send a range of data to a group of people simultaneously or route the range sequentially from one individual to the next. When other users receive the range, they can work with the data, enter comments in a text box, and send the range on.

For example, suppose you need data from several different people to complete your department's budget. You tell 1-2-3 who to send the budget to, and in what order, and specify that you want the range returned to you. Your co-workers add their data to the worksheet and 1-2-3 automatically routes it to the next person on your list. When the worksheet returns to you, 1-2-3 remembers where the

range came from and can merge the updated range into your original worksheet.

**Note** To do this you must have Lotus Notes Release 3 for Windows or later, or Lotus cc:Mail Release 1.11 for Windows or later, or other mail applications that use the Vendor-Independent Messaging Interface (VIM), or Microsoft Mail running under Windows for Workgroups Version 3.1.

**Help** For more information about range routing, search on "Range routing" in Help and select "Sending a range."

## Linking 1-2-3 with other applications

In the Microsoft Windows environment, you can share information across applications using links based on Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE). A **link** is a dynamic connection between a file in one Windows application and a file in another Windows application. Depending on the type of link, your linked data looks like ordinary worksheet data, or like a drawn object.

Using links to share data between applications is useful when you expect the data to change. For example, if you keep financial information in a 1-2-3 worksheet and use the same information in an Ami Pro® for Windows document, you can keep the data in the document up to date by linking it to the worksheet.

Every link involves a server and a client. The **server** contains the original data; the **client** uses that data. For example, when you create a link from a 1-2-3 worksheet to an Ami Pro document, 1-2-3 is the server because it provides data to Ami Pro. Ami Pro is the client because it uses the data from 1-2-3.

The server and client files can be any files created in Windows applications that support DDE or OLE, except the Untitled file in some applications. 1-2-3 supports OLE and DDE as both a client and a server.

A server can provide data to several clients, and a client can get data from several servers. In addition, a 1-2-3 file can be both a server and a client simultaneously.

**Note** You can't create a DDE or OLE link between two 1-2-3 worksheets or files. You use formulas to link worksheets. For more information, see "Referring to other files in formulas" on page 106.

Links can be automatic or manual. An **automatic link** updates the client application automatically when you change the data in the server application. A **manual link** updates only when you choose Edit Links Update.

## Creating links

1-2-3 provides several ways to create links. You choose a method based on how much you want to control the link process. You can copy and paste the link from a server application, or you can create the link from within 1-2-3. When you paste a link, you can let 1-2-3 choose the link format, or you can choose a format yourself.

**Help** You can also use macros or the @DDELINK @function to create links. For information about using macros to create links, search on "DDE and OLE macro commands." For more information about @DDELINK, search on "Information @functions."

### To link to another application from a 1-2-3 file

When you link to another application from 1-2-3, the other application is the server, and 1-2-3 is the client. The simplest way to create a link is to copy and paste it, using Edit Copy (in a saved file) and Edit Paste Link. In this case, 1-2-3 selects an appropriate format for the link. If you want more control over the appearance of the link, you can use Edit Paste Special and select the format yourself.

**Help** You can also use Edit Links Create to create the link without using the Clipboard and without leaving 1-2-3. For more information, search on "Links" in Help and select the topic "Edit Links Create."

#### To let 1-2-3 choose the link format

*You can now copy data between 1-2-3 and other applications by dragging with the mouse. For more information, see Chapter 8.*

1. Start the application and open the file that contains the original data.

   For example, to link to an Ami Pro document from a 1-2-3 worksheet, start Ami Pro and open or create the document that contains the data. The document must be named; it can't be Untitled.

2. Select the data you want to include in the 1-2-3 file.

   For example, in the Ami Pro document, select the text you want to include.

3. Choose Edit Copy to copy the data to the Clipboard.

   Leave the application open. If you want, you can minimize the application's window to an icon.

4. Start or return to 1-2-3 and open the file where you want the data.

5. Select the location in the worksheet where you want the data to appear.

   If you're pasting text or cell data, select a range or the top left cell of a range. If you're pasting a chart, drawn object, bitmap, or picture, select a range or a drawn object.

   **Caution** 1-2-3 writes over any existing data in the range if you paste text or cell data.

6. Choose Edit Paste Link.

1-2-3 selects an appropriate format and creates the link.

### To select the link format yourself

1. Repeat steps 1 through 5 of "To let 1-2-3 choose the link format" above.

2. Choose Edit Paste Special.

   The list box displays the formats that are shared between the server application and 1-2-3, the client.

3. In the "Using Clipboard format" list box, select a format.

   The following are examples of common formats:

   - **Picture** (sometimes referred to as Windows Metafile) scales well.
   - **Bitmap and DIB** provide better representations of a graphic than Picture, but don't scale well.
   - **Text** maintains characters but not attributes.

4. Choose Paste Link.

The data from the server application appears in the 1-2-3 worksheet. Because you selected Paste Link, the data you pasted is linked to the data in the server application. If the linked data in the server application changes, the data in your 1-2-3 worksheet updates.

### To link to a 1-2-3 file from another application

When you link to 1-2-3 from another application, 1-2-3 is the server and the other application is the client.

1. Make the 1-2-3 file that contains the original data the current file.

   For example, to link to a 1-2-3 worksheet from a Freelance Graphics presentation, start 1-2-3 and open or create a file that contains the data. The file must be a named file; it can't be Untitled.
2. Select the range, chart, or drawn object you want to use in the other application.
3. Choose Edit Copy.

   Leave 1-2-3 open. If you want, you can minimize the 1-2-3 window to an icon.
4. Start the other application and open the file you want to contain the data.
5. If necessary, indicate the position where you want the data to appear.
6. Paste the link.

   The command is usually Edit Paste Link or Edit Paste Special, but is different depending on the application.

The data from 1-2-3 appears in the client file.

## Getting information about links

You can see information about all client links in the current 1-2-3 file in one place. This is useful when you have several links and you want to review them.

### To get information about DDE or OLE links

1. Choose Edit Links.
2. Select DDE/OLE Links from the Link type drop-down box.
3. Select a link from the list of link names.

The illustration below shows an example of the Links dialog box when a link from Ami Pro to 1-2-3 is selected.

- **Application** is usually the name of the application that contains the original data. For DDE, this is the application name and path. For OLE, this is the object type created by the application.
- **Topic** is usually the drive, directory, and name for the file that contains the original data.
- **Item** is the location or name of the original data, such as a spreadsheet range or a bookmark.
- **Format** is the data format for the link.
- **Update mode** indicates whether the link is set to update automatically or manually. To update a manual link, choose Update.
- **Link status** indicates whether the link is active or inactive. An active link either updates automatically or is ready to be updated manually, depending on the current update mode. An inactive link is not up to date. You can choose Update to reactivate the link.
- **Range** is the range of cells that contains the linked data.

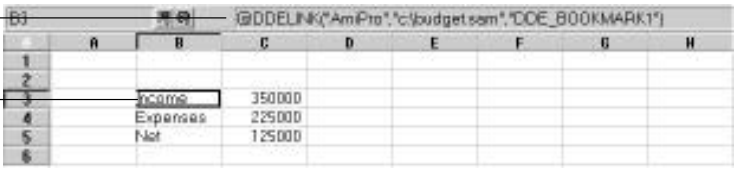
**4.** Choose Close.

## To get information about DDE links

When you create a DDE link, 1-2-3 places the @function @DDELINK in the top left corner of the link's destination range. You can look at this @function for information about the link. The illustration below shows a DDE link to Ami Pro in a 1-2-3 file.

1-2-3 displays @DDELINK in the edit line ...

... when you select the top left cell of the link



The arguments for @DDELINK contain information about the link, as shown below.

*app* *topic* *item*

@DDELINK("AmiPro","c:\budget.sam","DDE_BOOKMARK1")

- *app* is the DDE server application name
- *topic* is the file name, including path of the DDE server
- *item* is the DDE data item to link to

**Help** For more information about @DDELINK, search on "Information @functions" in Help.

## Modifying links

You can change the set-up of a link without leaving 1-2-3. This is useful, for example, if you want to change the link format. You can also update, delete, and deactivate links.

### To edit a link

*You can also edit a link by editing its @DDELINK @function.*

1. Choose Edit Links.
2. Select DDE / OLE links from the Link type drop-down box.
3. Select the link from the list.
4. Choose Edit.

5. Change the application, topic, item, and format as necessary.
6. Under Update mode, select an option.
   - Automatic updates the link automatically when the link is active.

- Manual updates the link only when you choose Update in the Edit Links dialog box.

7. To change the range, in the range text box, specify the range where you want to place the link data.
8. Choose OK to edit the link and return to the Links dialog box.
9. Choose Close to return to the file.

### To update, delete, or deactivate a link

1. Choose Edit Links.
2. Select DDE/OLE links from the Link type drop-down box.
3. Select the link from the list.
4. Do one of the following:
   - To get a new copy of the data from the server application, choose Update.
   - To delete the link permanently from the file, choose Delete.

     1-2-3 deletes the link and stops updating the linked data. Changes to source data no longer appear in the 1-2-3 file, and you can't update the link.
   - To stop updating the link temporarily, choose Deactivate.

     1-2-3 stops updating the linked data, but doesn't delete the link. Changes in the source data don't appear in the 1-2-3 file until you update the link. You can choose Update when you want to make the link active again.
5. Choose Close.

*You can also delete a link by deleting its @DDELINK @function.*

**Help** For detailed information on using macros with links, search on "Link macros" in Help.

## Embedding objects

Without exiting 1-2-3, you can create text or a picture in another Windows application and embed that data as an object in the current 1-2-3 file. When you embed an object from another application into a 1-2-3 file, the object and its data are stored in the .WK4 file, but you use the other application to create and edit the object.

Suppose, for example, that you want to create a graphic and add it to your worksheet. You can launch Freelance Graphics from within 1-2-3, create the graphic, then embed it in your worksheet. You can also copy existing information from another application to embed in your worksheet.

## To embed a new object

1. Make the 1-2-3 file into which you want to embed new data the current file and select where you want the embedded object to appear.

   You can select a cell or a drawn object.

2. Choose Edit Insert Object.

   The Object type list box displays all available applications that support OLE and the types of objects the applications create.

3. In the Object type list box, select the type of object you want to create.

   For example, to create a Freelance Graphics picture, select Freelance Presentation.

4. Choose OK.

   1-2-3 opens the application or makes it active if it's already open.

5. Create the object in the application you opened.
6. Choose File Update in the application to save the object.
7. Choose File Exit or File Exit & Return to exit the application and return to 1-2-3.

The data appears as an embedded object in the 1-2-3 file. You can double-click the object to restart the other application and edit the original data.

## To embed an existing object

1. Select the object and copy it to the Clipboard.
2. Make the 1-2-3 file into which you want to embed the object the current file.
3. Select the location in the worksheet where you want the data to appear.

   You can select a range, chart, or drawn object. 1-2-3 places the embedded object slightly to the right and below the range or drawn object you select.

4. Choose Edit Paste Special.

The list box displays the formats that are shared between the server application and 1-2-3.

5. Select the object format from the “Using Clipboard format” list box.

6. Choose Paste.

The data appears as an embedded object in the 1-2-3 file. You can double-click the object to restart the other application and edit the original data.

# A Sharing Files and Macros

This appendix contains information about sharing files between 1-2-3 Release 5 for Windows, 1-2-3 for DOS Releases 2, 3, and 4, and other programs.

It also explains how to use macros created in 1-2-3 for Windows Release 1, in 1-2-3 for DOS Releases 2, 3, and 4, and in 1-2-3 for Macintosh®. The last part of the appendix describes how to create macros in 1-2-3 Release 5 for use in 1-2-3 for DOS and 1-2-3 for Macintosh.

In this appendix, 1-2-3 for Windows Release 1 refers to Releases 1.0, 1.0a, and 1.1. 1-2-3 for DOS refers to DOS releases 2.01, 2.2, 2.3, 2.4, 3.0, 3.1, 3.1+, 3.4, and 4.0. Release 2 refers to 1-2-3 for DOS Releases 2.01, 2.2, 2.3, and 2.4. Release 3 refers to 1-2-3 for DOS Releases 3.0, 3.1, 3.1+, and 3.4. Release 4 refers to 1-2-3 Release 4 for DOS. 1-2-3 for Macintosh refers to 1-2-3 for Macintosh Releases 1.0 and 1.1.

## Opening and saving files

In addition to .WK4 and .WT4 files, you can open or save these file types:

| *Product* | *File type* | *What you can do* |
|---|---|---|
| 1-2-3 for Windows Release 1 | .WK3 | Open, Save |
| 1-2-3 for DOS Release 1A | .WKS | Open |
| 1-2-3 for DOS Release 2 | .WK1 | Open, Save |
| 1-2-3 for DOS Release 3 | .WK3 | Open, Save |
| 1-2-3 for DOS Release 4 | .WK3 | Open, Save |
| Symphony Releases 1.0 and 1.01 | .WRK | Open |
| Symphony Releases 1.1, 1.2, 2.0, 2.1, 2.2, and 3.0 | .WR1 | Open |

*Continued*

| *Product* | *File type* | *What you can do* |
|---|---|---|
| Microsoft Excel Versions 2.1, 2.2, 3.0, and 4.0 | .XLS<br>.XLW<br>.XLT | Open, Save<br>Open, Save<br>Open |
| dBASE III® and IV® | .DBF | Open, Save |
| FoxPro® 2.5 | .DBF | Open |
| Paradox 3.5 and 4.0 | .DB | Open, Save |
| Paradox for Windows | .DB | Open, Save |
| Products that create ASCII text files | .TXT<br>.PRN<br>.CSV<br>.DAT<br>.OUT<br>.IMX<br>.ASC | Open, Save<br>Open<br>Open<br>Open<br>Open<br>Open<br>Open |

If you're a Lotus Notes user, you can also open and save shared (.NS4) files. **Shared files** let more than one person create versions and scenarios at the same time. For more information on sharing versions and scenarios, see Chapter 17.

## Working with Release 2, 3, and 4 and Symphony files

You can open .WK1 and .WK3 files in 1-2-3 Release 5 for Windows and save them in their original format or as .WK4 files.

> **Note** To save a sealed file as a .WK1 file, first unseal it with File Protect. To convert a multiple-sheet file to a .WK1 file, save it as a .WK3 file and then use the Translate utility.

To work with a .WRK or .WR1 file in Symphony after you use it in 1-2-3 Release 5, save it as a .WK1 file.

1-2-3 Release 5 has new features that aren't available in 1-2-3 for DOS Release 2, 3, or 4, or in Symphony. When you save a .WK4 file as a .WK1 or .WK3 file, these features may be lost. To retain the features, save the file as a .WK4 file *before* you save it as a .WK1 or .WK3 file. For more information about what happens when you save a .WK4 file as a .WK1 or .WK3 file, see "What's different in files" on page 296.

## Working with Excel files

You can open Excel .XLS, .XLT, and .XLW files in 1-2-3. If the Excel file is protected with a password, remove the password in Excel before opening the file in 1-2-3. When you open an .XLT file, 1-2-3 interprets it as a sheet file and displays the file name with an .XLS extension in the 1-2-3 title bar.

If the Excel file contains any untranslatable information or links to other Excel files, 1-2-3 records the information in a log file. For example, if you open a file called DATA.XLS that contains an untranslatable formula, 1-2-3 creates a log file called DATA.LOG and saves it in the same directory as DATA.XLS.

> **Note** If you open a write-protected file that has an untranslatable formula, 1-2-3 saves the log file in your default directory, as specified with Tools User Setup. If you don't have a default directory, 1-2-3 saves the file in your Working Directory as specified in Program Item Properties for the 1-2-3 icon in Program Manager. If either directory is full or write-protected, 1-2-3 stops the translation.

When 1-2-3 creates a log file, you see the dialog box shown below and can choose whether to view the translated file or the log file.

You can also open the log file at any time using the Notepad accessory or a word-processing program such as Ami Pro®. You must edit untranslated functions and formulas before you can use them in 1-2-3.

Similarly, if you save a 1-2-3 file as an .XLS or .XLW file, and the file contains @functions that have no equivalents in Excel, or links to other 1-2-3 files, 1-2-3 creates a log file and saves it in the default directory. The log file has the same file name that you entered in the Save As dialog box, with a .LOG extension.

For more information on translating files to and from Excel file format, read the file XLREADME.TXT, which Install copies to your \PROGRAMS directory when you install 1-2-3. For information on installation, see Chapter 1.

## What's different in files

1-2-3 Release 5 contains many features not available in previous releases of 1-2-3. When you save a 1-2-3 Release 5 file as a .WK1 or .WK3 file, that information is either lost or converted to default settings. Also, because some features work differently in 1-2-3 Release 5 and 1-2-3 for DOS, the same file may look slightly different depending on the program in which you open it.

If you plan to share files with 1-2-3 for DOS Release 3 or 4, read "Sharing .WK1 and .WK3 files" below. If you plan to share files with 1-2-3 for DOS Release 2, read both "Sharing .WK1 and .WK3 files" and "Sharing .WK1 files" on page 300.

In the sections below, 1-2-3 for DOS refers to Releases 2, 3, and 4 unless otherwise noted.

## Sharing .WK1 and .WK3 files

When you save a 1-2-3 Release 5 .WK4 or .WT4 file as a .WK1 or .WK3 file, the following information is lost:

- Queries and query tables.

  1-2-3 saves query tables as worksheet data.
- Drawn objects except for charts.
- Maps and other embedded data from other Windows applications.
- Settings that control the display of the worksheet frame, grid lines, page breaks, and charts, and the displayed size of worksheet cells.
- Worksheet settings including names, and default text and cell background colors.

  If you don't delete or reorder the worksheets in a .WK3 file in DOS Releases 3 or 4, you see the previous worksheet names when you reopen the file in 1-2-3 Release 5.
- Worksheet tabs, except in DOS Release 4. DOS Release 4 supports worksheet tabs in black and white only.
- Text entered in the Doc Info dialog box
- Information necessary to use File Send Mail to send ranges of data

The sections below describe additional differences between 1-2-3 Release 5 and 1-2-3 for DOS.

### Versions and scenarios

If you save a Release 5 file containing versions and scenarios as a .WK1 file, 1-2-3 keeps only the version or scenario data currently displayed and treats it as worksheet data.

If you create versions and scenarios in Release 5 and then save them in a .WK3 file for use in 1-2-3 Release 4 for DOS, 1-2-3 retains the data but not the tracking information that tells you who created or modified the data, when, and why. Styling is also lost. All lowercase characters in version or scenario names are converted to uppercase. As a result, any @functions or macro commands that refer to such names will no longer work correctly. If the file contains any versions or scenarios with the same name, 1-2-3 renames them with a unique name. For example, if the file contains two versions called Best Case in the same range, 1-2-3 renames one BEST CASE1. If you reopen the .WK3 file in Release 5, 1-2-3 doesn't restore the lost information, or change the characters that were previously converted to uppercase back to lowercase.

> **Caution** Although you can save version and scenario data in a .WK3 file, only 1-2-3 Release 5 for Windows and 1-2-3 Release 4 for DOS can interpret such data. If you plan to share files between 1-2-3 Release 5 for Windows and 1-2-3 Release 4 for DOS, and want to retain all of the information associated with the versions and scenarios, and use the @functions and macros that refer to them, be sure to save the file as a .WK4 file *before* you save it as a .WK3 file, and use unique names that contain only uppercase characters.

You can work with versions and scenarios created in 1-2-3 Release 4 for DOS by opening the .WK3 file that contains them in 1-2-3 Release 5 for Windows. However, if the ranges that contain the versions exceed 2,000 cells, Release 5 can't interpret any versions and treats any visible version or scenario data as worksheet data.

### DDE links

If you save a file containing DDE links as a .WK1 or .WK3 file, 1-2-3 saves the links as add-in @functions. When you open the .WK1 file in Release 2, or the .WK3 file in Release 3 or 4, the add-in @functions evaluate to NA or to ERR, respectively. If you edit the file (but not the cells containing the @functions) and then reopen the file in 1-2-3 Release 5, 1-2-3 retains the DDE links.

### Charting

1-2-3 Release 5 lets you plot up to 23 data ranges and use chart types and options not available in 1-2-3 for DOS. When you save a .WK4

file as a .WK1 or .WK3 file and then open the file in 1-2-3 for DOS, you'll notice these differences:

- Charts display only the first six data series.
- Radar charts appear as line charts. 3D charts appear as the corresponding 2D chart type in versions of 1-2-3 for DOS that don't support 3D charts. Some chart types may look different in different versions of Release 2.
- The legend appears below the plot area.
- 1-2-3 converts data series colors and patterns to the closest equivalent in 1-2-3 for DOS.

  If you want the colors and patterns to look the same when you display the chart in 1-2-3 for DOS, use Chart Numeric Color to style the data series in 1-2-3 Release 5.
- Fonts may not map to a close equivalent.

If you don't edit the charts in a .WK3 file in 1-2-3 for DOS Release 3 or 4, you see the previous chart settings when you reopen the file in 1-2-3 Release 5.

To work with named charts created in 1-2-3 for DOS, open the file in 1-2-3 Release 5. Choose Edit Go To, select Chart in the Type of item drop-down box, then select the named chart in the list box. 1-2-3 adds the chart to the center of the worksheet area displayed on screen. You can drag the chart where you want it.

### Approach forms, reports, cross-tabs, and mailing labels

Approach forms, reports, cross-tabs, and mailing labels are embedded objects and are lost when you save the file containing them as either a .WK1 or .WK3. file.

### Data queries

To use input, output, and criteria ranges saved in a .WK1 or .WK3 file, use the /Data Query commands in 1-2-3 Classic or run the {QUERY-UPGRADE} macro command to convert the ranges for use with the new query commands in 1-2-3 Release 5.

{QUERY-UPGRADE} takes an *input-range*, *output-range*, and *criteria-range* argument, and an optional *query-name* argument. When you run the macro, 1-2-3 performs the query using the input and criteria ranges, writes over the output range with a new query table, and saves the named query. You only need to run the macro once for each query. After that, you can use the data with the new query commands.

**Help** For more information, type {query-upgrade and press **F1 (HELP).**

If you plan to share files containing queries with other versions of 1-2-3, you must use input, output, and criteria ranges and the /Data Query commands in 1-2-3 Classic. For more information, see "Using 1-2-3 Classic" on page 53.

### Styling

1-2-3 Release 5 gives you many more style options than 1-2-3 for DOS. You can use as many fonts as you want and choose from more text attribute and alignment settings. You can also use up to 256 colors, 64 patterns, 8 line styles and widths, 16 designer frames, 16 named styles, and 14 Style Gallery templates.

When you save a .WK4 file as a .WK1 or .WK3 file, and then open the file in 1-2-3 for DOS, the data in the file looks different depending on whether Wysiwyg is loaded. 1-2-3 Release 5:

- Uses the first eight fonts on the worksheet and converts the rest to similar fonts in 1-2-3 for DOS. Unusual fonts may not appear or print correctly when you open the file in 1-2-3 for DOS.
- Retains boldface, italics, and underlining.
- Places left-aligned or centered values to the right; aligns data that was evenly spaced in cells or aligned across columns to the left. Other alignment settings including vertical placement, orientation, rotation, and text wrapping are lost.
- Converts line and pattern colors to black; converts other colors to the closest 1-2-3 for DOS equivalent.
- Converts patterns to the closest type of shading.
- Converts line styles and widths to the closest equivalent.
- Converts designer frames with a drop shadow to drop shadows, and maps other designer frames to various border styles.
- Retains the first eight named styles. New settings such as number format and alignment, which are part of Release 5 named styles, are lost. Ranges formatted with other named styles retain their settings, but the named styles can't be applied to other ranges. 1-2-3 retains only the first six characters of each named style.
- Converts settings created with Style Gallery templates to the closest equivalent.

### Number formats

When you save a 1-2-3 Release 5 file that contains multiple currency formats as a .WK1 or .WK3 file and then open the file in 1-2-3 for DOS or 1-2-3 for Windows Release 1, 1-2-3 displays the multiple currency formats using the default currency setting specified in the version of 1-2-3 in which you open the file. If you reopen the file in Release 5, 1-2-3 doesn't restore the multiple currency formats.

If you create a .WK4 file that contains multiple currency formats in 1-2-3 Release 5, and then open the file in Release 4.0 or 4.01 for Windows, 1-2-3 displays the multiple currencies using the default currency setting specified in the version of 1-2-3 in which you open the file. If you don't modify the number formats, when you reopen the file in Release 5, 1-2-3 displays the multiple currency formats.

### Print settings

To use print settings that you saved in a .WK1 or .WK3 file created in 1-2-3 for DOS, use the /Print commands in 1-2-3 Classic. For more information, see "Using 1-2-3 Classic" on page 53.

### @Functions

1-2-3 Release 5 treats new @functions as add-in @functions when you save them in a .WK1 or .WK3 file. When you open the file in 1-2-3 for DOS, 1-2-3 displays each new @function as an add-in @function followed by a list of arguments. Sometimes in Release 2, a numeric code that identifies the @function follows the arguments. If you plan to reopen the file in 1-2-3 Release 5, don't edit the numeric code. New @functions evaluate to NA in Release 2, and to ERR in Releases 3 and 4.

In 1-2-3 Release 5, database @functions can take a formula as their last argument, while 1-2-3 for DOS supports only a criteria range. If you save Release 5 database @functions that contain a formula argument in a .WK1 or .WK3 file, they won't work in 1-2-3 for DOS.

If you save enhanced @functions that contain new arguments as a .WK1 or .WK3 file, the @functions evaluate to ERR.

When you open a .WK1 or .WK3 file containing @functions that were created by a 1-2-3 for DOS add-in program, the @functions evaluate to ERR in 1-2-3 Release 5.

## Sharing .WK1 files

This section describes additional differences between 1-2-3 Release 5 and Release 2. For more information, see "Sharing .WK1 and .WK3 files" on page 296.

When you save a 1-2-3 Release 5 file as a .WK1 file, you lose:

- ANSI characters that have no LICS equivalent
- Formula annotations
- Named print settings
- Perspective view and Group mode settings
- The third variable in 3-variable what-if tables

**Note** If you try to save a multiple-sheet file as a .WK1 file, you will get a message that prevents you from saving the file.

### Character sets

If 1-2-3 Release 5 displays nonstandard characters when you open a .WK1 (or .WR1) file, choose Tools User Setup International. Then select LICS or ASCII from the 1-2-3 Rel 2 drop-down box and reopen the file.

### Hidden cell contents

When you protect a file in 1-2-3 Release 5, hidden cell contents don't appear in the contents box. In Release 2.01, hidden cell contents appear in the control panel, even if global protection is turned on.

### Transposing ranges

When you transpose a range containing formulas in Release 5, 1-2-3 copies the formula results rather than the formulas.
Release 2.01 copies the formulas rather than their results.

### Negative values in pie charts

When you create a pie chart in 1-2-3 Release 5, 1-2-3 assumes that you don't want to plot negative values and omits the associated slices. Release 2 plots the absolute value of negative numbers. To make 1-2-3 Release 5 pie charts consistent with Release 2, use @ABS to make the negative numbers positive, or create formulas to copy the positive value of the numbers to another range.

### Number formats

When you save number formats that don't exist in Release 2 in a .WK1 file, 1-2-3 converts the formats to Release 2 default formats. For example, if you save a 1-2-3 Release 5 file that contains data formatted as Automatic, 1-2-3 changes the format to General.

### Formulas containing undefined range names

1-2-3 Release 5 lets you use a range name in a formula even if you haven't assigned the name to a range. The formula evaluates to ERR until you assign the range name to a range address. Release 2 doesn't let you use an undefined range name in a formula.

### File links

In 1-2-3 Release 5, when you open a .WK1 file containing a reference to another file, the file link looks like this:

@@("<<filename.ext>>cell reference")

If you open a .WK1 file containing a file link in Release 2.01, the formula results in ERR because Release 2.01 doesn't support file links.

### Significant digits

Because 1-2-3 Release 5 calculates values of up to 18 significant digits while Release 2 calculates to only 15 digits, a logical formula comparing two values may produce different results in the two programs. If needed, use @ROUND to round the result to 15 significant digits.

### Displaying long values

For display only, 1-2-3 Release 5 rounds the number of digits in a value to fit in a cell. Release 2 cuts off the digits that don't fit.

### Labels and formulas with more than 240 characters

Labels containing more than 240 characters are cut off after the 240th character when you save them in a .WK1 file. Formulas with more than 240 characters are saved as is. If you try to edit these formulas in Release 2, 1-2-3 truncates them after the 240th character.

### Extra sort keys

1-2-3 Release 5 lets you create up to 255 sort keys, while Release 2 supports only two sort keys. If you save a 1-2-3 Release 5 file containing extra sort keys as a .WK1 file, the extra sort keys are lost.

## Using 1-2-3 for Windows Release 1 macros

1-2-3 Release 5 uses menu equivalent keywords in {} (braces) instead of {ALT} keystroke macros. For example, the macro command to open a file in 1-2-3 Release 5 is {FILE-OPEN} instead of {ALT}fo.

Before you can run {ALT} keystroke macros from 1-2-3 for Windows Release 1 in Release 5, you need to translate them with the Macro Translator. The Macro Translator is a separate Windows application that you can install when you install 1-2-3 Release 5. For information on installation, see Chapter 1.

## Translating macro commands

The macros that you want to translate must be stored in a .WK3 file. The Macro Translator translates each {ALT} keystroke command and its arguments to the fully qualified Release 5 equivalent and leaves all other data in the file unchanged. For example, the Macro Translator converts the macro shown here:

**{ALT}fo{ALT "n"}c:\123w\file0001.wk3{TAB 4}~**

to this macro:

**{FILE-OPEN "c:\123w\file0001.wk3"}**

To use the translated macros, open the .WK3 file in 1-2-3 Release 5.

> **Caution** Once you translate {ALT} keystroke macros, you can't use them in 1-2-3 for Windows Release 1, or translate them back to their previous state.

### Macros that use unsupported commands

If a Release 1 macro uses a menu command that's either unavailable in Release 5 or that works differently from its Release 5 equivalent, the Macro Translator tries to substitute an equivalent 1-2-3 for DOS Release 3.1 keystroke command that will run in 1-2-3 Classic. For example, because you perform data queries differently in Releases 1 and 5, the Macro Translator converts Data Query commands to equivalent /Data Query commands. If no equivalent is available, the Macro Translator can't translate the command.

### Macros that use directional key names in a dialog box

Macros that use directional key names such as {UP} or {DOWN} to select items in a list box may produce different results depending on the context in which you run them. For example, the macro below chooses Style Font and then uses {DOWN} to select the fourth font to style a range:

{ALT}sf{ALT "f"}{DOWN 4} {ALT "a"}A1..F1{TAB 2}~

If you install different fonts on your computer and then run the macro, the fourth font in the Fonts list box may no longer be the one you want. To avoid this problem, the Macro Translator tries to convert the macro to a Release 5 equivalent that displays the appropriate dialog box and waits for you to select the desired item. If no equivalent is available, the Macro Translator can't translate the command.

## Selecting a directory

You can translate .WK3 files in their current directory or create translated versions in a different directory. If you translate the files in their current directory, the Macro Translator creates a backup copy of each file with a .BK3 extension before translating it. If you select a different directory for the translated files, the Macro Translator puts a translated version of each file and a copy of its associated .FM3 file in that directory, and leaves the original .WK3 file unchanged.

> **Caution** If you translate a file without selecting a different directory for the translated version, and then retranslate the file, a new backup file replaces the previous backup copy. To make sure that you keep a copy of the original .WK3 file intact, select a different directory for the translated files.

## Documenting translation problems

The Macro Translator creates a file called 123WXMAC.LOG, which lists the translated files and any translation problems. If the Macro Translator can't translate a macro command, it converts the command to a comment using the {—} macro. If a macro spans several cells, the Macro Translator converts the cell contents to comments until it reaches the end of the macro as shown below.

| Original macro | Translated macro |
|---|---|
| {ALT}r0 | {—} |
| {ALT "n"} | {—} |
| c:\123w\work\file0001.wk3 | {—} |
| {TAB 4}"" | {FILE-OPEN "c:\123w\work\file0001.wk3"} |

The log file lists each untranslated macro's location and contents, and information about the error. The Macro Translator puts the log file in the same directory as the translated files. If you translate files in different directories, the Macro Translator creates a separate 123WXMAC.LOG file in each directory. If you translate files in a directory already containing a log file, the Macro Translator inserts the new translation information at the beginning of the log file.

To view the log file, open it in Windows using the Notepad accessory or a word-processing program such as Ami Pro. You must edit untranslated macro commands in the translated .WK3 file before you can use them in Release 5. Each log file remains in the directory containing the translated files until you delete it.

## Restrictions on translating macros

The Macro Translator converts {ALT} keystroke macros in .WK3 files in one directory at a time. If the files or the directory are read-only, change the access privileges or copy the files to another directory before you translate them. If the files are protected with a password,

unseal the files with File Protect in Release 5 before translating them. The sections below list the kinds of macros you can't translate and those you should edit to avoid unexpected results.

### Macros that aren't translated

You can't translate the following kinds of macros created in 1-2-3 for Windows Release 1:

- Macros that don't have an assigned range name
- Macros in a named range where the first cell of the macro is different from the first cell of the named range
- Macros containing range names that match macro command keywords
- Macros that don't start with 1-2-3 in Ready mode or with the Worksheet window active
- Macros that create or rearrange all drawn objects except charts
- Macros that perform tasks in the Transcript or Help windows
- Macros that use an add-in product

**Note** The Macro Translator recognizes macros created with SmartPak™ but doesn't translate SmartPak menu commands. If a macro application uses {CHOOSEONE}, {MENUINSERT}, or {MENUCREATE} to branch to subroutines in an unnamed range, you must edit the subroutines before you can use them in Release 5.

### Macros that use existing settings in dialog boxes

If you created a macro in 1-2-3 for Windows Release 1 that uses existing settings in a dialog box without explicitly specifying them, the Macro Translator treats such settings as optional arguments and omits them from the translated macro. In cases where the translated macro requires specified arguments, you must edit the macro to include them before you can run it in Release 5.

### Macros that use default chart names

By default, 1-2-3 for Windows Release 1 names charts Graph1, Graph2, and so on, while Release 5 uses Chart 1, Chart 2, and so on. When you translate Release 1 macros, the Macro Translator leaves the chart names in the macros unchanged. As a result, some translated macros may not work correctly, and you must edit them to reflect the correct chart name. To avoid problems, use explicit chart names in your macros.

### Macros that modify themselves

Because the Macro Translator can't translate macros that modify themselves, you must edit such macros if you want to translate them. For example, the following macro opens the file whose name is stored in the range called FILENAME:

+"{ALT}fo"&FILENAME&"{TAB 4}~"

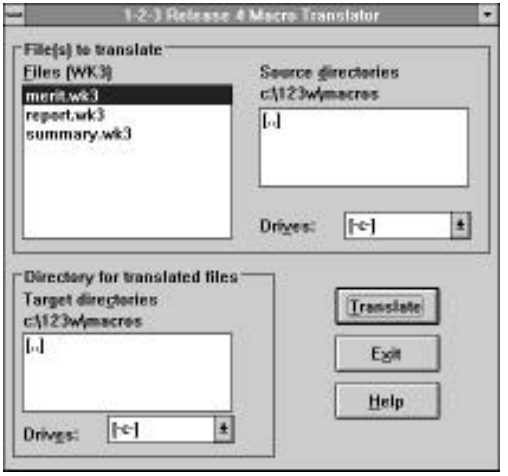
When you change the contents of FILENAME, the macro changes also. To use the macro, substitute the name of the file you want to open.

### Macros that don't end with a blank cell or number

If you don't include a blank cell or a number between the last line of one macro and the first line of the next, the Macro Translator interprets and translates the macros as one. To make sure that the Macro Translator interprets your macro commands correctly, check that your macros end where you want them to.

## To translate macros

To start the Macro Translator, open the Lotus Applications window (or the group window that contains the Macro Translator) and double-click the Macro Translator icon. The Macro Translator appears in its own window.




For detailed information on using the Macro Translator, start the Macro Translator and choose Help.

## Using 1-2-3 for DOS macros

You use macros created in 1-2-3 for DOS Releases 2, 3, and 4 by opening the .WK1 or .WK3 file containing the macros and then executing them. 1-2-3 Release 5 runs the macros in 1-2-3 Classic, which supports all Release 3.1 keystroke macros.

> **Note** If the Release 2 macros you want to use are stored in a macro library .MLB file, you must first copy them to a blank worksheet as described below.

If you want to use 1-2-3 for DOS macros, as well as new Release 5 macros that you create in the same file, use File Save As to save the file as a .WK4 file.

You can run 1-2-3 for DOS macros by choosing Tools Macro Run, pressing **ALT+F3 (RUN)**, or using the keyboard. To run a backslash macro using the keyboard, press **CTRL** and the single-letter name simultaneously. (You can't press **ALT** and the letter to run a macro because **ALT** makes the menu bar active in Release 5.)

Some commands work differently in 1-2-3 Release 5. For example, {MENUBRANCH} displays a dialog box instead of a macro menu in the control panel. For more information, see "What's different in macros" below. Other commands, such as /Worksheet Status, have no effect in 1-2-3 Release 5, and 1-2-3 ignores them.

### To copy macros from an .MLB file

1. Start the version of Release 2 in which you created the .MLB file.

   You see a blank worksheet.
2. Attach and run the MACROMGR.ADN add-in.
3. To retrieve the macro library you want to use, choose Load.
4. To copy the contents of the macro library to the blank worksheet, choose Edit and then Overwrite.
5. Enter the range where you want to copy the macros.
6. Save the worksheet.

Now you can open the .WK1 file that contains the macros in 1-2-3 Release 5.

## What's different in macros

Some macro commands work differently in Release 5 than in previous releases of 1-2-3 for DOS and 1-2-3 for Windows, as described below.

| *Macro command* | *Description* |
|---|---|
| {CALC} | Accepts an argument that tells 1-2-3 how many times to recalculate |
| {EDIT-CLEAR} | Accepts "contents," "styles," or "both" as an optional *property* argument; if you run {EDIT-CLEAR} using a "graphs" argument, the command does nothing |
| {FRAMEOFF} | Has no effect in Release 5; use {SET} |
| {FRAMEON} | Has no effect in Release 5; use {SET} |
| {GETLABEL} | Displays a prompt in a dialog box and suspends the macro until you enter data in a text box and choose OK or Cancel |
| {GETNUMBER} | Displays a prompt in a dialog box and suspends the macro until you enter data in a text box and choose OK or Cancel |
| {LINK-ASSIGN} | No longer runs with the previous *property* arguments; use the new *clear-styles* argument |
| {MENUBRANCH} | Displays a dialog box with items in a list box |
| {MENUCALL} | Displays a dialog box with items in a list box |

## Solving problems

This section describes problems you may have running macros created in 1-2-3 for DOS Release 2, 3, or 4 or 1-2-3 for Windows and how to solve them.

### Macros that refer to cell or range addresses

A macro containing a cell or range address may produce different results depending on the file the cell pointer is in when you run the macro. For example, a macro in worksheet A of the file SALES may affect worksheet A when the cell pointer is in worksheet A, and worksheet B when the cell pointer is in worksheet B.

To avoid this problem, do one of the following:

- Include a worksheet letter or name in the address, for example, A:A12 or February:A12.

- Precede the address with both a file reference and a worksheet letter, for example, <<SALES>>A:A12.

If a macro command uses an address without a worksheet letter, worksheet name, or file reference, for example, {EDIT-GOTO A6}, Release 5 assumes the address is in the same worksheet as the cell pointer. If the macro command affects the flow of control, for example, {BRANCH A6}, 1-2-3 assumes the address is in the same worksheet as the macro. If a macro command uses a cell or range reference that doesn't include a file reference, 1-2-3 assumes the address is in the same file as the cell pointer.

### Macros that depend on window size

In Releases 2 and 3, the worksheet automatically displays 8 columns and 20 rows. In 1-2-3 Release 4 for DOS, the worksheet displays 19 or 20 rows depending on whether worksheet tabs are visible. In 1-2-3 Release 5 for Windows, the number of columns and rows in the Worksheet window varies depending on how you arrange and size the open windows, whether worksheet tabs are visible, and your monitor's resolution. As a result, 1-2-3 for DOS macros that depend on window size may produce unexpected results in Release 5.

*You can also use the {SET} macro command to control the window height and width.*

You can avoid this problem by making 1-2-3 Release 5 display the same number of columns and rows as 1-2-3 for DOS. For Release 2 and 3 macros, and 1-2-3 Release 4 for DOS macros that assume worksheet tabs are turned off, use View Set View Preferences to set the custom zoom so the Worksheet window displays 20 rows at a time. If needed, use Style Worksheet Defaults to adjust the column width so that you see 8 columns at a time.

### Macros containing messages

You may need to edit instructions in 1-2-3 for DOS files that explain how to run the macros they contain. For example, if a Release 2 file contains the instruction, "Press ALT+N to run the macro," change it to "Press CTRL+N to run the macro."

### Macros that save and open files

When you save a new file, Release 5 assigns a .WK4 extension unless you specify otherwise. Therefore, macros that save files without indicating an extension, and then open them using a .WK3 extension won't run. Replace references to .WK3 with .WK4 in such macros.

### Macros containing unsupported 1-2-3 for DOS commands

1-2-3 Classic doesn't include some 1-2-3 for DOS Release 2 commands, such as /A or /WGDOA, or new 1-2-3 Release 4 for

DOS commands, such as /GOAL or /GOAS. Be sure to edit macros that refer to these commands.

### Macros that adjust displayed data

When you "poke" data from another Windows application into Release 5, 1-2-3 recognizes label prefix and formula characters and justifies the data or displays formula results. If you created macros in Release 1 to strip out displayed label prefix characters or to display formula results instead of formula text, these macros are no longer required.

### Macros that refer to version and scenario names

When you save a Release 5 file containing versions and scenarios as a .WK3 file for use in 1-2-3 Release 4 for DOS, 1-2-3 converts any lowercase characters in the version and scenario names to uppercase. As a result, macro commands that refer to these names will no longer work correctly in Release 5. If you plan to use the macros in the .WK3 file with Release 5, be sure to use only uppercase characters in the version and scenario names.

## Using 1-2-3 for Macintosh macros

You can use macros created in 1-2-3 for Macintosh by saving them in a .WK3 file and then opening the file in 1-2-3 Release 5. Although the Release 5 macro language is designed to be compatible with 1-2-3 for Macintosh, it also includes new macros and arguments to support features not available in other 1-2-3 releases.

Some macro commands are the same in 1-2-3 for Macintosh and Release 5. In cases where the applications use different macro commands to perform the same task, you can still use the 1-2-3 for Macintosh command in Release 5. For example, {DATA-FILL}, the 1-2-3 for Macintosh command, and {FILL}, the Release 5 command, both let you enter values in a range. For a list of macro commands you can use in 1-2-3 for Macintosh and Release 5, see "Sharing macros with 1-2-3 for Macintosh" on page 311.

### Styling and printing

Although 1-2-3 Release 5 supports the same general style features as 1-2-3 for Macintosh, some 1-2-3 for Macintosh style options may not map to an equivalent in Release 5. Also, some 1-2-3 for Macintosh print options aren't available in Release 5. 1-2-3 ignores such options when it finds them in a 1-2-3 for Macintosh macro.

### Working with charts and databases

Because many chart and database macros work differently in Release 5 and 1-2-3 for Macintosh, you can't use the macros from one application in the other. To share chart or database macros between 1-2-3 Release 5 and 1-2-3 for Macintosh, use keystroke macros. You can run keystroke macros in both versions of 1-2-3 through 1-2-3 Classic.

## Sharing macros with 1-2-3 for Macintosh

You can use the macros listed below in both 1-2-3 Release 5 and 1-2-3 for Macintosh. Some macros may produce different results depending on the features that are supported. For example, if you use an "outline" argument with {STYLE-FONT-EMPHASIS} in Release 5, 1-2-3 ignores the argument because it doesn't support outlining as a text attribute. For information on how macros differ, refer to the macro command descriptions in 1-2-3 Release 5 Help and in your 1-2-3 for Macintosh documentation.

### Macro commands

| | | |
|---|---|---|
| {?} | {—} | {ABS} |
| {ALERT} | {APPENDBELOW} | {APPENDRIGHT} |
| {BACKSOLVE} | {BACKSPACE} | {BEEP} |
| {BLANK} | {BRANCH} | {BREAK} |
| {BREAKOFF} | {BREAKON} | {BS} |
| {CALC} | {CE} | {CELL-ENTER} |
| {CHOOSE-FILE} | {CHOOSE-ITEM} | {CHOOSE-MANY} |
| {CHOOSE-ONE} | {CLEARENTRY} | {CLOSE} |
| {COLUMN-WIDTH} | {COLUMN-WIDTH-RESET} | {CONTENTS} |
| {D} | {DATA-DISTRIBUTION} | {DATA-EXTERNAL-CONNECT} |
| {DATA-EXTERNAL-CREATE-TABLE} | {DATA-EXTERNAL-DISCONNECT} | {DATA-EXTERNAL-SEND-COMMAND} |
| {DATA-FILL} | {DATA-MATRIX-INVERT} | {DATA-MATRIX-MULTIPLY} |
| {DATA-PARSE} | {DATA-REGRESSION} | {DATA-REGRESSION-RESET} |
| {DATA-TABLE-1} | {DATA-TABLE-2} | {DATA-TABLE-3} |
| {DATA-TABLE-RESET} | {DEFINE} | {DEL} |
| {DELETE} | {DELETE-COLUMNS} | {DELETE-ROWS} |
| {DELETE-SHEETS} | {DISPATCH} | {DOWN} |
| {EDIT} | {EDIT-CLEAR} | {EDIT-CLEAR-CONTENTS} |
| {EDIT-CLEAR-STYLES} | {EDIT-COPY} | {EDIT-CUT} |
| {EDIT-FIND} | {EDIT-FIND?} | {EDIT-MOVE-CELLS} |
| {EDIT-PASTE} | {EDIT-PASTE-SPECIAL} | {EDIT-QUICK-COPY} |
| {EDIT-REPLACE} | {EDIT-REPLACE-ALL} | {END} |
| {ESC} | {ESCAPE} | {FC} |
| {FF} | {FILE} | {FILE-CLOSE} |

*Continued*

## Macro commands

{FILE-COMBINE}
{FILE-EXIT}
{FILE-EXTRACT}
{FILE-GET-RESERVATION}
{FILE-IMPORT}
{FILE-NEW}
{FILE-OPEN}
{FILE-PRINT}
{FILE-PRINT?}
{FILE-PRINT-NAME-ADD}
{FILE-PRINT-NAME-USE}
{FILE-PRINT-RESET}
{FILE-PRINT-SELECTION}
{FILE-PRINT-SELECTION?}
{FILE-QUIT}
{FILE-RELEASE-RESERVATION}
{FILE-RETRIEVE}
{FILE-SAVE}
{FILE-SEAL}
{FILE-SEAL-NETWORK-RESERVATION}
{FILESIZE}
{FILE-UNSEAL}
{FILE-UPDATE-LINKS}
{FIRSTCELL}
{FIRSTFILE}
{FOR}
{FORBREAK}
{FORM}
{FORMBREAK}
{FRAMEOFF}
{FRAMEON}
{GET}
{GET-FORMULA}
{GET-LABEL}
{GET-NUMBER}
{GETPOS}
{GET-RANGE}
{GOTO}
{GRAPH}
{GRAPH-NEW}
{GRAPHOFF}
{GRAPHON}
{GRAPH-VIEW}
{HIDE-COLUMNS}
{HIDE-SHEETS}
{HOME}
{IF}
{INDICATE}
{INS}
{INSERT}
{INSERT-COLUMNS}
{INSERT-ROWS}
{INSERT-SHEETS}
{L}
{LASTCELL}
{LASTFILE}
{LC}
{LEFT}
{LET}
{LF}
{LOOK}
{MENU}
{MENUBRANCH}
{MENUCALL}
{MENU-CREATE}
{MENU-RESET}
{NAME}
{NEXTFILE}
{NEXTSHEET}
{NF}
{NS}
{ONERROR}
{OPEN}
{PAGE-BREAK-COLUMN}
{PAGE-BREAK-ROW}
{PANELOFF}
{PANELON}
{PF}
{PGDN}
{PGUP}
{PREVFILE}
{PREVSHEET}
{PS}
{PUT}
{QUERY}
{QUIT}
{R}
{RANGE-FORMAT}
{RANGE-FORMAT-RESET}
{RANGE-GOTO}
{RANGE-NAME-CREATE}
{RANGE-NAME-DELETE}
{RANGE-NAME-DELETE-ALL}
{RANGE-NAME-LABEL-CREATE}
{RANGE-NAME-TABLE}
{RANGE-PROTECT}
{RANGE-TRANSPOSE}
{RANGE-UNPROTECT}
{RANGE-VALUE}
{READ}
{READLN}
{RECALC}
{RECALCCOL}
{RESTART}
{RETURN}
{RIGHT}
{ROLLBACK}
{ROW-HEIGHT}
{ROW-HEIGHT-RESET}
{SCROLL-COLUMNS}
{SCROLL-ROWS}
{SCROLL-TO-CELL}
{SCROLL-TO-COLUMN}
{SCROLL-TO-ROW}
{SELECT-ALL-SHEETS}
{SELECT-BIGLEFT}
{SELECT-BIGRIGHT}
{SELECT-DOWN}
{SELECT-FIRSTCELL}
{SELECT-HOME}
{SELECT-LASTCELL}
{SELECT-LEFT}
{SELECT-NEXTSHEET}
{SELECT-PGDN}
{SELECT-PGUP}
{SELECT-PREVSHEET}
{SELECT-RANGE}
{SELECT-RANGE-APPEND}
{SELECT-RIGHT}

*Continued*

### Macro commands

| | | |
|---|---|---|
| {SELECT-UP} | {SEND-MAIL} | {SET} |
| {SETPOS} | {SHOW-COLUMNS} | {SHOW-SHEETS} |
| {STYLE-ALIGN} | {STYLE-BACKGROUND-COLOR} | {STYLE-BACKGROUND-PATTERN} |
| {STYLE-BORDER} | {STYLE-FONT} | {STYLE-FONT-ALL} |
| {STYLE-FONT-EMPHASIS} | {STYLE-FONT-RESET} | {STYLE-FONT-SIZE} |
| {STYLE-FOREGROUND-COLOR} | {STYLE-TEXT-COLOR} | {SYSTEM} |
| {TAB} | {TABLE} | {U} |
| {UP} | {USER-SETUP-UPDATE} | {WAIT} |
| {WINDOW} | {WINDOW-ACTIVATE} | {WINDOW-ADJUST} |
| {WINDOW-ARRANGE} | {WINDOW-CLOSE} | {WINDOWSOFF} |
| {WINDOWSON} | {WINDOW-STATE} | {WORKSHEET-TITLES} |
| {WRITE} | {WRITELN} | {ZOOM} |

## Using Release 5 macros in other 1-2-3 releases

You can create macros in 1-2-3 Release 5 to use in 1-2-3 for DOS Releases 2, 3, and 4 and 1-2-3 for Macintosh, as long as the other versions of 1-2-3 support the macro commands. You can't create 1-2-3 for Windows Release 1 macros in Release 5.

To create a macro, enter the macro instructions in a worksheet or copy recorded instructions from the Transcript window into the worksheet. If you want the macros to work in 1-2-3 for DOS, you must use keystroke macros created with 1-2-3 Classic. If a 1-2-3 Release 5 for Windows macro and a 1-2-3 for Macintosh macro use a different keyword to perform the same task, the Transcript window records the Release 5 macro command.

For information on 1-2-3 Release 5 macro commands you can use with 1-2-3 for Macintosh, see "Sharing macros with 1-2-3 for Macintosh" on page 311.

# B Using Memory Efficiently

Many factors affect the amount of memory available to 1-2-3 and the amount of memory 1-2-3 uses. Some important factors are the type and amount of memory on your system, how you configure your system's memory for Windows, other programs in memory, and how you structure your files. This appendix describes how 1-2-3 uses memory and ways you can conserve memory.

**Note** For information about how to configure your system's memory for Windows, see your Windows documentation.

## How 1-2-3 allocates memory

Knowing how 1-2-3 allocates memory helps you conserve memory when setting up files and entering data. When you enter data in a file, 1-2-3 uses memory to track information about the file. For example, 1-2-3 keeps track of all cells containing data.

To make processing faster and more efficient, 1-2-3 divides each column into groups of 8 cells. When you enter data in any of the 8 cells in a group, 1-2-3 prepares each cell in the group to receive data. This is called **opening** a cell.

1-2-3 also divides columns into larger sections of 512 cells each. Within each section, 1-2-3 opens the cells between the top and bottom entries. For example, if you enter data in A1 and A512, 1-2-3 opens A1..A512. However, if you make entries in A1 and A513, 1-2-3 opens only A1..A8 and A513..A520, not the cells in between, because A1 and A513 are in different 512-cell sections.

**Note** In some cases, opening cells takes more memory than stated above. For instance, the first entry you make in a worksheet takes approximately 30 extra bytes because 1-2-3 creates a table to track your future entries.

## Regaining memory

When you start to run out of memory on your computer, processing slows down noticeably. To speed up processing and avoid running out of memory, you can do the following:

- Structure your files for efficient memory use.
- Eliminate blocks of unusable memory.
- Remove unneeded worksheet entries and settings.
- Consolidate worksheets and files.
- Remove unneeded formulas.
- Turn off Undo.

If you run out of memory, you may not be able to complete your last command or entry. If there are active files you want to save, close other open windows, and then try to save the files. You can also gain memory by removing other programs from memory, and by closing any files you're not working in.

### Structuring file contents efficiently

The easiest way to use memory efficiently in 1-2-3 is to keep data areas as close together as possible. Enter your data in focused areas of the worksheet rather than scattering it all over the worksheet and the file.

For example, entering data in cells A1 and A513 uses more memory than entering the same data in cells A1 and A2 because 1-2-3 allocates memory in sections of 512 cells.

In addition, to structure your files efficiently, you can:

- Insert additional rows of data rather than additional columns.

  1-2-3 allocates additional memory in vertical blocks.
- Use fewer worksheets.

  Entering data in additional worksheets uses more memory. It's more efficient to enter data in blank areas of existing worksheets rather than adding new worksheets.

## Eliminating blocks of unusable memory

As you build files, memory can fragment into small blocks of unused memory surrounded by large blocks of used memory. Sometimes the blocks of unused memory are too small for 1-2-3 to use. This can happen when you're first building a spreadsheet and making many changes, such as adding different styles and fonts.

The surest way to regain fragmented memory is to save and close your files, exit 1-2-3, then restart 1-2-3, and open your files again. Saving the file you're working on, closing it, and reopening it without exiting 1-2-3 can also eliminate fragmented memory. When you read a file back into memory, 1-2-3 places the entire file in one large block of memory, if possible, consolidating the small blocks of unusable memory.

## Removing unneeded data and settings

Cells that contain unnecessary data or settings waste memory. You can restore this memory by finding and removing the unneeded data or settings.

To find unneeded data or settings, first find the active area of each worksheet (the rectangular area between the top left entry and the bottom right entry) by pressing **END HOME**. If the active area is bigger than you expected, it probably contains unneeded data or settings. You can use **END CTRL+HOME** to find the active area of a multiple-sheet file.

To remove unneeded data and settings:

- Select only the data you need, choose File Save As and use the "Selected range only" option to save this data to a new file. Then delete the old file.
- Select unneeded data, styles, charts, and other drawn objects, and choose Edit Clear to delete them.
- Select entire columns, rows, and worksheets containing unneeded data or settings, and choose Edit Delete to delete them.

## Consolidating worksheets and files

Every worksheet and file containing data requires memory when you open it in 1-2-3. If you need more memory, consolidate your data into fewer worksheets and fewer files. Then delete the unneeded worksheets and files.

Open windows also use substantial amounts of memory, even if you reduce the windows to icons. To conserve memory, close any windows you're not using.

## Removing unneeded formulas

*You can use Tools Audit to find all formulas in the current file or in all active files. For more information, search on "Tools" and select "Tools Commands" in Help.*

Formulas use more memory than their results. If your file includes formulas and you need only the results, you can save memory by converting the formulas to values.

### To convert formulas to values

1. Select the range containing the formulas.
2. Choose Edit Cut.
3. Choose Edit Paste Special.
4. Select Formulas as values.
5. Choose OK.

## Turning off Undo

When Undo is turned on, the amount of memory available can vary significantly after each command. If you erase a large range, for example, 1-2-3 uses lots of memory to store the range for Undo. If you're running out of memory, choose Tools User Setup and deselect Undo.

## Hard disk storage

Another memory constraint is the amount of hard disk space available to 1-2-3. Windows uses space on the hard disk for a **swap file**. This is a hidden file that reserves hard disk space for Windows to use when it gets low on memory. You can configure the swap file to give 1-2-3 more space on your hard disk. For information about configuring the Windows swap file, see your Windows documentation.

Insufficient space problems can also occur when you put too many files on your hard disk. If you try to write data to a filled hard disk, Windows returns a message saying the disk is full and asks you to choose another drive for the file, either a disk drive or another hard disk partition.

To avoid running out of hard disk space, use the Windows File Manager to delete files you no longer need. Obsolete files on the hard disk take up space that you can use to store current files. If you want to keep obsolete files, copy them to floppy disks before deleting them from the hard disk.

# C

# Using the Lotus Multibyte Character Set (LMBCS)

1-2-3 for Windows uses the American National Standards Institute (ANSI) character set to display and print characters, and the Lotus Multibyte Character Set (LMBCS) to store characters. This appendix describes how to use LMBCS codes to enter characters that aren't on your keyboard. The tables in this appendix list all the LMBCS codes you can use.

## Entering LMBCS characters

You can enter any LMBCS character by using the @CHAR @function or an **extended compose sequence**, a series of keystrokes. You can also enter some LMBCS characters by using a **compose sequence**, another series of keystrokes. The tables in this appendix list a compose sequence for all characters that have a compose sequence.

LMBCS codes are divided into two different groups, Group 0 and Group 1. In this appendix, there is a separate table for each group.

### To enter a character by using @CHAR

1. Enter @CHAR in your worksheet.

   You can use the @Function menu, or you can type it.

2. Specify, as the @function argument, the LMBCS code number for the character you want to enter.

   For example, the LMBCS code for the section symbol (§) is 277. To enter §, enter @CHAR(277) in your worksheet.

3. Confirm the entry by clicking the Confirm button or by pressing **ENTER** or ↑, ↓, →, ←.

## To enter a character by using extended compose

The keystrokes you use for extended compose depend on whether the character is in Group 0 or Group 1. For Group 0, you use a 0 and the LMBCS code; for Group 1, you use a 1 and the key code.

1. Press **ALT+F1 (COMPOSE)** twice.
2. Press 0 or 1 according to which group the LMBCS character is in.
3. Press - (hyphen).
4. Do one of the following:
   - If the character is in Group 0, type the LMBCS code listed in the first column of the LMBCS tables. If the LMBCS code has only two digits, precede it with a 0 (zero).

     For example, the ! (exclamation point) is in Group 0 and has a LMBCS code of 33. To enter it, press **ALT+F1 (COMPOSE)** twice and type 0-033.
   - If the character is in Group 1, type the three-digit key code listed in the second column of the LMBCS tables.

     For example, the § (section symbol) is in Group 1 and has a key code of 021. To enter it, press **ALT+F1 (COMPOSE)** twice and type 1-021.
5. Confirm the entry by clicking the Confirm button or by pressing **ENTER** or ↑, ↓, →, ←.

**Note** If Windows can't display a LMBCS character, a fallback character appears. Windows supports the ANSI character set. To enter ANSI codes in 1-2-3, press **ALT+** a number from the number keypad. See your Windows documentation for information about what numbers to use and what characters Windows can display.

## To enter a character by using a compose sequence

1. Press **ALT+F1 (COMPOSE)** and type the characters listed in the second column of the LMBCS tables.

   For example, to enter the character £, press **ALT+F1 (COMPOSE)** and type L=.
2. Confirm the entry by clicking the Confirm button or by pressing **ENTER** or ↑, ↓, →, ←.

**Note** In the LMBCS tables, if a compose sequence is in bold, you must type the characters in the order they appear in the table. All other compose sequences are not order-sensitive.

## LMBCS tables

The tables that follow list the LMBCS codes for 1-2-3 and the characters they produce.

LMBCS codes 32 through 255 comprise Group 0. These characters represent Code Page 850 characters 32 to 255. The first table lists these LMBCS codes.

LMBCS codes 256 through 511 comprise Group 1. These codes produce characters previously available in the Lotus International Character Set (LICS), as well as other characters available in the IBM code page supported by the country driver. The second table lists the first 127 of these codes; the remaining Group 1 LMBCS codes duplicate Group 0 codes.

LMBCS codes 512 and above comprise other groups of characters that 1-2-3 can store in a file as LMBCS codes, but can't display or print.

### Group 0

This section describes the Group 0 LMBCS characters.

**Note** Codes 1 through 31 aren't LMBCS codes. Using @CHAR with the numbers 1 through 31 produces the characters for LMBCS codes 257 through 287, listed in the Group 1 table.

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 32 | | Space | Space |
| 33 | | Exclamation point | ! |
| 34 | | Double quotes | “ |
| 35 | + + | Pound sign | # |
| 36 | | Dollar sign | $ |
| 37 | | Percent | % |
| 38 | | Ampersand | & |
| 39 | | Close single quote | ’ |
| 40 | | Open parenthesis | ( |
| 41 | | Close parenthesis | ) |
| 42 | | Asterisk | * |
| 43 | | Plus sign | + |
| 44 | | Comma | , |
| 45 | | Minus sign | – |
| 46 | | Period | . |
| 47 | | Slash | / |

*Continued*

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 48 | | Zero | 0 |
| 49 | | One | 1 |
| 50 | | Two | 2 |
| 51 | | Three | 3 |
| 52 | | Four | 4 |
| 53 | | Five | 5 |
| 54 | | Six | 6 |
| 55 | | Seven | 7 |
| 56 | | Eight | 8 |
| 57 | | Nine | 9 |
| 58 | | Colon | : |
| 59 | | Semicolon | ; |
| 60 | | Less than | < |
| 61 | | Equal sign | = |
| 62 | | Greater than | > |
| 63 | | Question mark | ? |
| 64 | a a or A A | At sign | @ |
| 65 | | A, uppercase | A |
| 66 | | B, uppercase | B |
| 67 | | C, uppercase | C |
| 68 | | D, uppercase | D |
| 69 | | E, uppercase | E |
| 70 | | F, uppercase | F |
| 71 | | G, uppercase | G |
| 72 | | H, uppercase | H |
| 73 | | I, uppercase | I |
| 74 | | J, uppercase | J |
| 75 | | K, uppercase | K |
| 76 | | L, uppercase | L |
| 77 | | M, uppercase | M |
| 78 | | N, uppercase | N |
| 79 | | O, uppercase | O |
| 80 | | P, uppercase | P |
| 81 | | Q, uppercase | Q |
| 82 | | R, uppercase | R |
| 83 | | S, uppercase | S |
| 84 | | T, uppercase | T |
| 85 | | U, uppercase | U |
| 86 | | V, uppercase | V |

*Continued*

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 87 | | W, uppercase | W |
| 88 | | X, uppercase | X |
| 89 | | Y, uppercase | Y |
| 90 | | Z, uppercase | Z |
| 91 | ( ( | Open bracket | [ |
| 92 | / / | Backslash | \ |
| 93 | ) ) | Close bracket | ] |
| 94 | v v | Caret | ^ |
| 95 | | Underscore | _ |
| 96 | | Open single quote | ‘ |
| 97 | | a, lowercase | a |
| 98 | | b, lowercase | b |
| 99 | | c, lowercase | c |
| 100 | | d, lowercase | d |
| 101 | | e, lowercase | e |
| 102 | | f, lowercase | f |
| 103 | | g, lowercase | g |
| 104 | | h, lowercase | h |
| 105 | | i, lowercase | i |
| 106 | | j, lowercase | j |
| 107 | | k, lowercase | k |
| 108 | | l, lowercase | l |
| 109 | | m, lowercase | m |
| 110 | | n, lowercase | n |
| 111 | | o, lowercase | o |
| 112 | | p, lowercase | p |
| 113 | | q, lowercase | q |
| 114 | | r, lowercase | r |
| 115 | | s, lowercase | s |
| 116 | | t, lowercase | t |
| 117 | | u, lowercase | u |
| 118 | | v, lowercase | v |
| 119 | | w, lowercase | w |
| 120 | | x, lowercase | x |
| 121 | | y, lowercase | y |
| 122 | | z, lowercase | z |
| 123 | ( - | Open brace | { |
| 124 | ^ / | Bar | \| |
| 125 | ) - | Close brace | } |

*Continued*

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 126 | - - | Tilde | ~ |
| 127 | | Delete | ⌂ |
| 128 | C , | C cedilla, uppercase | Ç |
| 129 | u ” | u umlaut, lowercase | ü |
| 130 | e ’ | e acute, lowercase | é |
| 131 | a ^ | a circumflex, lowercase | â |
| 132 | a ” | a umlaut, lowercase | ä |
| 133 | a ‘ | a grave, lowercase | à |
| 134 | a * | a ring, lowercase | å |
| 135 | c , | c cedilla, lowercase | ç |
| 136 | e ^ | e circumflex, lowercase | ê |
| 137 | e ” | e umlaut, lowercase | ë |
| 138 | e ‘ | e grave, lowercase | è |
| 139 | i ” | i umlaut, lowercase | ï |
| 140 | i ^ | i circumflex, lowercase | î |
| 141 | i ‘ | i grave, lowercase | ì |
| 142 | A ” | A umlaut, uppercase | Ä |
| 143 | A * | A ring, uppercase | Å |
| 144 | E ’ | E acute, uppercase | É |
| 145 | **a e** | ae diphthong, lowercase | æ |
| 146 | **A E** | AE diphthong, uppercase | Æ |
| 147 | o ^ | o circumflex, lowercase | ô |
| 148 | o ” | o umlaut, lowercase | ö |
| 149 | o ‘ | o grave, lowercase | ò |
| 150 | u ^ | u circumflex, lowercase | û |
| 151 | u ‘ | u grave, lowercase | ù |
| 152 | y ” | y umlaut, lowercase | ÿ |
| 153 | O ” | O umlaut, uppercase | Ö |
| 154 | U ” | U umlaut, uppercase | Ü |
| 155 | o / | o slash, lowercase | ø |
| 156 | **L = l = L– or l–** | British pound sterling symbol | £ |
| 157 | O / | O slash, uppercase | Ø |
| 158 | x x or X X | Multiplication sign | × |
| 159 | f f | Guilder | *f* |
| 160 | a ’ | a acute, lowercase | á |
| 161 | i ’ | i acute, lowercase | í |
| 162 | o ’ | o acute, lowercase | ó |
| 163 | u ’ | u acute, lowercase | ú |
| 164 | n ~ | n tilde, lowercase | ñ |

*Continued*

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 165 | N ~ | N tilde, uppercase | Ñ |
| 166 | a _ or A _ | Feminine ordinal indicator | ª |
| 167 | O _ or o _ | Masculine ordinal indicator | º |
| 168 | ? ? | Question mark, inverted | ¿ |
| 169 | RO ro R0 or r0 | Registered trademark symbol | ® |
| 170 | -] | End of line symbol/Logical NOT | ¬ |
| 171 | **1 2** | One half | 1/2 |
| 172 | **1 4** | One quarter | 1/4 |
| 173 | ! ! | Exclamation point, inverted | ¡ |
| 174 | < < | Left angle quotes | « |
| 175 | > > | Right angle quotes | » |
| 176 | | Solid fill character, light | ▒ |
| 177 | | Solid fill character, medium | ▓ |
| 178 | | Solid fill character, heavy | ▓ |
| 179 | | Center vertical box bar | │ |
| 180 | | Right box side | ┤ |
| 181 | **A '** | A acute, uppercase | Á |
| 182 | **A ^** | A circumflex, uppercase | Â |
| 183 | **A '** | A grave, uppercase | À |
| 184 | CO co C0 or c0 | Copyright symbol | © |
| 185 | | Right box side, double | ╣ |
| 186 | | Center vertical box bar, double | ║ |
| 187 | | Top right box corner, double | ╗ |
| 188 | | Bottom right box corner, double | ╝ |
| 189 | c \| c / C \| or c / | Cent sign | ¢ |
| 190 | Y = y = Y - or y - | Yen sign | ¥ |
| 191 | | Top right box corner | ┐ |
| 192 | | Bottom left box corner | └ |
| 193 | | Bottom box side | ┴ |
| 194 | | Top box side | ┬ |
| 195 | | Left box side | ├ |
| 196 | | Center horizontal box bar | ─ |
| 197 | | Center box intersection | ┼ |
| 198 | a ~ | a tilde, lowercase | ã |
| 199 | A ~ | A tilde, uppercase | Ã |

*Continued*

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 200 | | Bottom left box corner, double | ╚ |
| 201 | | Top left box corner, double | ╔ |
| 202 | | Bottom box side, double | ╩ |
| 203 | | Top box side, double | ╦ |
| 204 | | Left box side, double | ╠ |
| 205 | | Center horizontal box bar, double | ═ |
| 206 | | Center box intersection, double | ╬ |
| 207 | XO xo X0 or x0 | International currency sign | ¤ |
| 208 | d - | Icelandic eth, lowercase | ð |
| 209 | D - | Icelandic eth, uppercase | Ð |
| 210 | E ^ | E circumflex, uppercase | Ê |
| 211 | E " | E umlaut, uppercase | Ë |
| 212 | E ‘ | E grave, uppercase | È |
| 213 | i <space> | i without dot (lowercase) | ı |
| 214 | I ’ | I acute, uppercase | Í |
| 215 | I ^ | I circumflex, uppercase | Î |
| 216 | I " | I umlaut, uppercase | Ï |
| 217 | | Bottom right box corner | ╝ |
| 218 | | Top left box corner | ╒ |
| 219 | | Solid fill character | ╓ |
| 220 | | Solid fill character, lower half | ■ |
| 221 | / <space> | Vertical line, broken | ¦ |
| 222 | I ‘ | I grave, uppercase | Ì |
| 223 | | Solid fill character, upper half | ■ |
| 224 | O ’ | O acute, uppercase | Ó |
| 225 | s s | German sharp (lowercase) | ß |
| 226 | O ^ | O circumflex, uppercase | Ô |
| 227 | O ‘ | O grave, uppercase | Ò |
| 228 | o ~ | o tilde, lowercase | õ |
| 229 | O ~ | O tilde, uppercase | Õ |
| 230 | **/ u** | Greek mu, lowercase | µ |
| 231 | p - | Icelandic thorn, lowercase | þ |
| 232 | P - | Icelandic thorn, uppercase | Þ |
| 233 | U ’ | U acute, uppercase | Ú |
| 234 | U ^ | U circumflex, uppercase | Û |
| 235 | U ‘ | U grave, uppercase | Ù |

*Continued*

| *LMBCS code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|
| 236 | y ’ | y acute, lowercase | ´y |
| 237 | Y ’ | Y acute, uppercase | ´Y |
| 238 | ^ – | Overline character | ¯ |
| 239 | | Acute accent | ´ |
| 240 | - = | Hyphenation symbol | - |
| 241 | + – | Plus or minus sign | ± |
| 242 | - - or = = | Double underscore | ‗ |
| 243 | **3 4** | Three quarters sign | 3/4 |
| 244 | | Paragraph symbol | ¶ |
| 245 | | Section symbol | § |
| 246 | : - | Division sign | ÷ |
| 247 | , , | Cedilla accent | ¸ |
| 248 | ^ 0 | Degree symbol | ° |
| 249 | | Umlaut accent | .. |
| 250 | ^ . | Center dot | . |
| 251 | ^ 1 | One superscript | 1 |
| 252 | ^ 3 | Three superscript | 3 |
| 253 | ^ 2 | Two superscript | 2 |
| 254 | | Square bullet | ■ |
| 255 | | Null | |

## Group 1

This section describes the Group 1 LMBCS characters.

| *LMBCS code* | *Key code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|---|
| 256 | (000) | | Null | |
| 257 | (001) | | Smiling face | ☺ |
| 258 | (002) | | Smiling face, reversed | ☻ |
| 259 | (003) | | Heart suit symbol | ♥ |
| 260 | (004) | | Diamond suit symbol | ♦ |
| 261 | (005) | | Club suit symbol | ♣ |
| 262 | (006) | | Spade suit symbol | ♠ |
| 263 | (007) | | Bullet | ● |
| 264 | (008) | | Bullet, reversed | ◘ |
| 265 | (009) | | Open circle | ○ |
| 266 | (010) | | Open circle, reversed | ◙ |
| 267 | (011) | | Male symbol | ♂ |
| 268 | (012) | | Female symbol | ♀ |
| 269 | (013) | | Musical note | ♩ |
| 270 | (014) | | Double musical note | ♫ |
| 271 | (015) | | Sun symbol | ☼ |
| 272 | (016) | | Forward arrow indicator | ► |
| 273 | (017) | | Back arrow indicator | ◄ |
| 274 | (018) | | Up-down arrow | ↕ |
| 275 | (019) | | Double exclamation points | !! |
| 276 | (020) | !p or !P | Paragraph symbol | ¶ |
| 277 | (021) | SO so S0 or s0 | Section symbol | § |
| 278 | (022) | | Solid horizontal rectangle | ▬ |
| 279 | (023) | | Up-down arrow, perpendicular | ↨ |
| 280 | (024) | | Up arrow | ↑ |
| 281 | (025) | | Down arrow | ↓ |
| 282 | (026) | | Right arrow | → |
| 283 | (027) | **m g** | Left arrow | ← |
| 284 | (028) | | Right angle symbol | ∟ |
| 285 | (029) | | Left-right symbol | ↔ |
| 286 | (030) | **b a** | Solid triangle | ▲ |
| 287 | (031) | **e a** | Solid triangle inverted | ▼ |
| 288 | (032) | **" <space>** | Umlaut accent, uppercase | ¨ |
| 289 | (033) | **~ <space>** | Tilde accent, uppercase | ~ |

*Continued*

| *LMBCS code* | *Key code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|---|
| 290 | (034) | | Ring accent, uppercase | ° |
| 291 | (035) | ^ **<space>** | Circumflex accent, uppercase | ^ |
| 292 | (036) | ‘ **<space>** | Grave accent, uppercase | ‘ |
| 293 | (037) | ’ **<space>** | Acute accent, uppercase | ’ |
| 294 | (038) | **“ Λ** | High double quotes, opening | “ |
| 295 | (039) | | High single quote, straight | ' |
| 296 | (040) | | Ellipsis | ... |
| 297 | (041) | | En mark | – |
| 298 | (042) | | Em mark | — |
| 299 | (043) | | Null | |
| 300 | (044) | | Null | |
| 301 | (045) | | Null | |
| 302 | (046) | | Left angle parenthesis | < |
| 303 | (047) | | Right angle parenthesis | > |
| 304 | (048) | **<space> ”** | Umlaut accent, lowercase | .. |
| 305 | (049) | **<space> ~** | Tilde accent, lowercase | ~ |
| 306 | (050) | | Ring accent, lowercase | ° |
| 307 | (051) | **<space>** ^ | Circumflex accent, lowercase | ^ |
| 308 | (052) | **<space> ‘** | Grave accent, lowercase | ‘ |
| 309 | (053) | **<space> ’** | Acute accent, lowercase | ’ |
| 310 | (054) | ”v | Low double quotes, closing | ” |
| 311 | (055) | | Low single quote, closing | , |
| 312 | (056) | | High double quotes, closing | ” |
| 313 | (057) | **_ <space>** | Underscore, heavy | — |
| 314 | (058) | | Null | |
| 315 | (059) | | Null | |
| 316 | (060) | | Null | |
| 317 | (061) | | Null | |
| 318 | (062) | | Null | |
| 319 | (063) | | Null | |
| 320 | (064) | **O E** | OE ligature, uppercase | Œ |
| 321 | (065) | **o e** | oe ligature, lowercase | œ |
| 322 | (066) | Y ” | Y umlaut, uppercase | Ÿ |
| 323 | (067) | | Null | |
| 324 | (068) | | Null | |
| 325 | (069) | | Null | |
| 326 | (070) | | Left box side, double joins single | ╞ |
| 327 | (071) | | Left box side, single joins double | ╟ |

*Continued*

| *LMBCS code* | *Key code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|---|
| 328 | (072) | | Solid fill character, left half | ▌ |
| 329 | (073) | | Solid fill character, right half | ▐ |
| 330 | (074) | | Null | |
| 331 | (075) | | Null | |
| 332 | (076) | | Null | |
| 333 | (077) | | Null | |
| 334 | (078) | | Null | |
| 335 | (079) | | Null | |
| 336 | (080) | | Bottom box side, double joins single | ╧ |
| 337 | (081) | | Top box side, single joins double | ╤ |
| 338 | (082) | | Top box side, double joins single | ╥ |
| 339 | (083) | | Bottom single left double box corner | ╙ |
| 340 | (084) | | Bottom double left single box corner | ╘ |
| 341 | (085) | | Top double left single box corner | ╒ |
| 342 | (086) | | Top single left double box corner | ╓ |
| 343 | (087) | | Center box intersection, vertical double | ╫ |
| 344 | (088) | | Center box intersection, horizontal double | ╪ |
| 345 | (089) | | Right box side, double joins single | ╢ |
| 346 | (090) | | Right box side, single joins double | ╡ |
| 347 | (091) | | Top single right double box corner | ╖ |
| 348 | (092) | | Top double right single box corner | ╕ |
| 349 | (093) | | Bottom single right double box corner | ╜ |
| 350 | (094) | | Bottom double right single box corner | ╛ |
| 351 | (095) | | Bottom box side, single joins double | ╨ |
| 352 | (096) | **i j** | ij ligature, lowercase | ij |
| 353 | (097) | **I J** | IJ ligature, uppercase | IJ |
| 354 | (098) | **f i** | fi ligature, lowercase | fi |
| 355 | (099) | **f l** | Fl ligature, lowercase | fl |
| 356 | (100) | ' n | n comma, lowercase | 'n |
| 357 | (101) | l . | l bullet, lowercase | l· |
| 358 | (102) | L . | L bullet, uppercase | L· |
| 359 | (103) | | Null | |
| 360 | (104) | | Null | |
| 361 | (105) | | Null | |
| 362 | (106) | | Null | |
| 363 | (107) | | Null | |

*Continued*

| *LMBCS code* | *Key code* | *Compose sequence* | *Description* | *Character* |
|---|---|---|---|---|
| 364 | (108) | | Null | |
| 365 | (109) | | Null | |
| 366 | (110) | | Null | |
| 367 | (111) | | Null | |
| 368 | (112) | | Single dagger symbol | † |
| 369 | (113) | | Double dagger symbol | ‡ |
| 370 | (114) | | Null | |
| 371 | (115) | | Null | |
| 372 | (116) | | Null | |
| 373 | (117) | | Null | |
| 374 | (118) | **T M T m or t m** | Trademark symbol | ™ |
| 375 | (119) | **l r** | Liter symbol | ℓ |
| 376 | (120) | | Null | |
| 377 | (121) | | Null | |
| 378 | (122) | | Null | |
| 379 | (123) | | Null | |
| 380 | (124) | **K R K r or k r** | Krone sign | Kr |
| 381 | (125) | - [ | Start of line symbol | ⎡ |
| 382 | (126) | **L I L i or l i** | Lira sign | ₤ |
| 383 | (127) | **P T P t or p t** | Peseta sign | Pt |

**Note** LMBCS codes 384 through 511 duplicate LMBCS codes 128 through 255, for use with code groups of other countries. Refer to LMBCS codes 128 through 255 in the Group 0 table starting on page 321 for a list of these characters.

# Index

**Note** Page numbers in **bold** refer to definitions.

## Symbols


& (ampersand), 100
<> (angle brackets), 100, 264
' (apostrophe), 77, 144
> (arrowhead),
* (asterisk), 103, 132, 143, 154, 235
@ (at sign), 101, 115, 143
\ (backslash), 270
{ } (braces), 266
[] (brackets), 116, 262
^ (caret), 77, 101, 144
: (colon), 53, 129, 230
, (comma), 116, 230, 265
$ (dollar sign), 76, 101, 109
... (ellipses), 50, 174
= (equal sign), 100, 102
! (exclamation point), 129, 230
> (greater-than symbol), 100
< (less-than symbol), 53, 100
– (minus sign), 101
# (number sign), 101, 230
( ) (parentheses), 101, 108, **117**
. (period), 101, 116, 129, 230, 265
+ (plus sign), 101, 143
??? (question marks), 129, 235
" " (quotation marks), 77, 102, 117, 263
; (semicolon), 116, 263, 265
/ (slash), 53, 77, 101
~ (tilde). *See* Help*
~(tilde). *See* **Help***
| (vertical bar), 75, 144, 176
@Functions. See under F, 331


## A


Absolute references in formulas, **108**
Accelerator keys. *See* **Help***
Active file, **55**
Active window, 35
  *See also* **Help***
Add-ins, 32
  *See also* **Help***
Adding
  *See also* Creating; Inserting
  @functions to @Function menu, 120
  borders and frames, 127
    *See also* **Help***
  colors, 126
    *See also* **Help***
  columns, 90–92
  designer frames, 127
    *See also* **Help***
  drawn objects, 173
  fields to query tables, 240
  headers and footers, 143
  page breaks, 145–146
  print titles, 146–148
  rows, 90–92
  SmartIcons to an icon set, 255
  titles and notes. *See* **Help***
  unit titles, charts. *See* **Help***
  worksheets, 38, 59–60
Addresses
  cell, 38, **69**, 101
  in formulas, 104
  range, 70
Adjustable cells, Solver, **223**
Adjusting addresses, 108
Aggregate columns. *See* **Help***
Alias, field name. *See* **Help***
Aligning data, 129–130
  labels and values, 77
Alphabetizing. *See* Sorting
{ALT} keystroke macros, 302
Ami Pro, 295, 304
Ampersands in text formulas, 100
Analyzing data
  frequency distributions, **201**
  matrixes, **205**
  regressions, **202**
Analyzing formulas
  cell dependents. *See* **Help***
  circular references. *See* **Help***
  file links. *See* **Help***
  formula precedents. *See* **Help***
Anchoring drawn objects. *See* **Help***
#AND#, logical operators
  in criteria, 233
  in formulas, 100
  in macros, 265
Angle brackets (<>) in file references, 106, 264
Answers, Solver. *See* **Help***
Apostrophe ('). *See* **Help***
Appending records to database tables, 245
Applications, client and server, 283
Arcs, creating, 174
Area charts, **163**
Argument separators, 116, 263, 265
  *See also* **Help***
Arguments
  enclosing in quotation marks, **117**
  for individual @functions, 121
    *See also* **Help***
  in @functions, 116
  in macro commands, **262**, 266
  types of, 117, 263
Arithmetic operators, **101**
Arranging drawn objects, 181–182
Arrow keys
  and entering data, 75–76
  selecting ranges with, 70
Arrows, creating, 174
.ASC files, 294
ASCII files. *See* Text files

Assigning
macros to buttons. *See* **Help***
macros to SmartIcons, 258
Assumptions. *See* Versions
Asterisk (*)
and passwords, 154
as wildcard characters, 235
in cells, 125, 132
in formulas, 101
in Print Preview window, 143
At sign (@)
beginning @functions, 115
with headers and footers, 143–144
Attachments, mail, 282
Attributes, text, **125**
Auditing worksheets, 113–114
Autoexecute macros, **275**
Automatic, file saving, 31
Automatic links, 284
Automatic number format, 123
Automatic recalculation, 112, 274
Autosave. *See* **Help***
Axis, chart
labels. *See* **Help***
scales. *See* **Help***
titles. *See* **Help***

## B

Background colors, 127
*See also* **Help***
Backing up disks, 5
Backslash macros, running, 307
Backslash name, macro, **270**
Backsolver, **209**
*See also* **Help***
Backup file, Macro Translator, 304
Bar charts, 162–163
Best answer, Solver. *See* **Help***
Bin range in frequency distribution, **201**
Binding constraints, Solver. *See* **Help***
Bitmap format, **285**
Bitmaps, pasting. *See* **Help***
.BK3 files, 304
Blank cells, 102, 267, 277
.BMP extension, 257
Borders
adding, 127
copying, 130
Braces ({ }) and macro commands, 266
{BREAKOFF} and {BREAKON} macros, 273–274
Bringing pictures into worksheets, 177
Building. *See* Creating

## C

C range. *See* **Help***
Calc button, 112
{CALC} macro, 274
Calculating
*See also* Recalculation
1-variable what-if tables. *See* **Help***
2-variable what–if tables. *See* **Help***
3-variable what-if tables. *See* **Help***
formulas, 107
frequency distribution, 201–202
Calendar. *See* Dates
Cancel button, **36**, 52, 75
Canceling
commands, 52
entries in cells, 76
Candlestick HLCO chart, **166**
Caret (^), 77, 101, 144
Cascading windows, **46**
Case sensitivity
in passwords, 154
in sort orders, 242
Cell, current, **38**
Cell addresses, **69**
copying, 108
in formulas, 101
Cell dependents. *See* **Help***
Cell pointer, **38**, 62, 76
Cells, **38**
and memory management, 317
asterisks (*) in, 103, 132
blank, 102, 267, 277
canceling entries in, 76
deleting format of. *See* **Help***
editing, 82
entering data in, 76
hiding data in, 136
moving to, 62–63
naming, 93
opening, **315**
selecting, 69
using with Solver, 222
what-if table input, **213**
Centering data, 148–150
Changes
saving, 40
tracking, 58
Changes, saving, 66–68
Changing
*See also* Editing
alignments, 129
attributes, 125–126
chart elements. *See* **Help***
chart types, 160
colors, 126
*See also* **Help***
column width, 132–134
*See also* **Help***
data affecting formulas, 104, 107
default chart type, 161
default settings. *See* **Help***
edges. *See* **Help***
file names, 67
fonts, 125–126
labels on macro buttons. *See* **Help***
lines. *See* **Help***
map features, 172
number formats, 123–125
page orientation, 150
patterns, 127
*See also* **Help***
print margins, 148
references, 109
relationships betweeen criteria, 234
row heights, 134–135
sets of SmartIcons, 255, 256
sizes of drawn objects, 180
styles, 123–134
*See also* **Help***
view preferences. *See* **Help***
window sizes. *See* **Help***
@CHAR, 319
Character sets, 301

Characters
  label-prefix, **77**, 230
  LMBCS, 319
  wildcard, **235**
Chart commands
  Axis. *See* **Help***
  Data Labels. *See* **Help***
  Grids. *See* **Help***
  Heading. *See* **Help***
  Legend. *See* **Help***
  Name, 168
  Numeric Color, 170
    *See also* **Help***
  Ranges. *See* **Help***
  Set Preferred, 161
  Type, 160
  Use Preferred, 161
Charts, **157**
  *See also* **Drawn objects**
  accessing named, 298
  and what-if tables, 217
  axes. *See* **Help***
  changing to default, 161
  changing types, 160
  checking spelling in, 84–85
  compatibility, 297–298
  creating, 158–160
  data ranges. *See* **Help***
  default, 159, 161
  default names, 305
  displaying data values in, 161
  hiding. *See* **Help***
  plotting by columns and rows, 158
  printing, 140
  selecting type of, 167
  sizing, 9
  styling elements, 169
  titles. *See* **Help***
  types of, 162–168
Check boxes, 50
Checking
  1-2-3 package contents, 1
  criteria, 243
  formulas for errors, 103
  macros for errors, 276
  spelling, 84–85
Choosing
  chart types, 167
  commands, 42, 47–49
  fields in query tables, 240
  link formats, 284–285
  menus, 47
  SmartIcons, 253
Circles. *See* Ellipses
Circular references. *See* **Help***
Classic window, 1-2-3, 53
Clearing. *See* Deleting
Clearing sort ranges. *See* **Help***
Client applications, **283**
Clipboard, **86**, 284
Closing
  files, 40, 68
  Version Manager window, 185
  windows, 45
Collating sequence, 242
  *See also* **Help***
Collections
  printing, 140
  selecting, **72**, 74
    *See also* **Help***
Colors
  *See also* **Help***
  adding and changing, 39, 126, 172
  copying, 130
  default worksheet, 30
Columns, **73**
  adding, 90–92
  aggregate. *See* **Help***
  changing widths of, 132–134
  computed. *See* **Help***
  deleting, 91
  freezing as titles, 64–65
  hiding, 135–137
  moving, 89
  plotting, 158
  printing as titles, 146
  selecting, **73**
  sizing, 132–134
Combining
  @functions, 115, 117
  criteria, 233–234
  files, 317
    *See also* **Help***
  header and footer text, 143
  strings in text formulas, 100
  worksheets, 317
Comma
  as argument separator, 116, 265
  as decimal separator, 117
Comma format, 76, 123
Commands, **47**
  1-2-3 Release 3.1, 53
    *See also* **Help***
  canceling, 52
  choosing from menus, 48–54
  main menu, **47**
  selecting ranges for, 70
  undoing, 53
  Wysiwyg, 53
    *See also* **Help***
Comments text box, 67
Comparison bar chart, **163**
Compatibility
  with .WK1 files, 296–301
  with .WK3 files, 296–300
Compose sequence, **319**, 320
Compressing printed data, 149–150
Computed columns. *See* **Help***
Condition arguments, **117**, 265
Confirm button, **36**, 75
Confirming cell entries, 75–76, 103
Connecting
  *See also* Links
  to external database tables, 247
Constraints, Solver, **222**
Contents, package, 1–2
Contents box, **36**, 82
Control menu, 45
Control menu box, 35
Control panel, 35
  in Windows, 30
Copy protection, removing, 4
Copying
  data, 86–88
    *See also* **Help***
  data affecting formulas, 109–112
  drawn objects, 179
  formula results, 111
  formulas, 109–112
  macros from an .MLB file, 307
  macros from the Transcript window, 269
  styles, 130
Correcting errors. *See* **Help***

Correcting mistakes, 53
Correlations in regression analysis, **202**
Creating
  bitmaps for SmartIcons, 256–258
  charts, 158–160
  database tables, 230–231
  drawn objects, 173–178
  external database tables, 250
  formulas, 101
  links, 284–286
  macro buttons, 271
  macro commands, 262
  macros, 313
  multiple worksheets, 38
  query tables, 236
  scenarios, 10–11, 192–193
  sets of SmartIcons, 255
  shared files, 195–196
  text blocks, 176
  version reports, 190–191
  versions, 10, 186–187
  what-if tables, 211
Creation command, database, 250
Criteria, **231**
  @functions in, 232
  and wildcard characters, 235
  changing relationships between, 234
  checking, 243
  combining, 233–234
  database table, **231**
  defining, 11
  formulas in, 232
  ranges, 298–299
Cross-tabulation. *See* **Help***
.CSV files, 294
Currency format, 76, 123, 300
  *See also* **Help***
Current cell, 38, 69
Current file, **55**
Current worksheet, **38**
Cursor. *See* Cell pointer
Custom fill sequences. *See* **Help***
Customizing
  @function menu, 120
  @Function menu, 22
  1-2-3. *See* **Help***
  charts, 169
  page settings, 148
  SmartIcons, 256
Cutting. *See* Copying; Deleting

## D

.DAT files, 294
Data
  aligning, 129
  and effects of moving formulas, 111
  and macros in same worksheet, 261
  and memory management, 315, 316
  combining. *See* **Help***
  copying, 86–88
  deleting, 82
  displaying, 136
  editing, 82–85
  enlarging, 64, 149–150
  entering automatically, 80
  entering in cells, 75
  extracting. *See* **Help***
  finding and replacing text, 83–84
  hiding, 135–137
  labels. *See* **Help***
  linking, 283
  moving, 88–90
  parsing. *See* **Help***
  plotting with charts, 157
  poking, 310
  preventing changes to, 153
  printing, 139–152
  queries, 11, 298–299
  series, **158**
    *See also* **Help***
  shrinking, 64, 149–150
  sorting, 241–243
  styling, 123–132
  transferring, 281
  transposing. *See* **Help***
  values in charts, 161
Data labels. *See* **Help***
Data matrixes, 205
Data points, **163**
Data ranges. *See* **Help***
Data tables. *See* What-if tables
Database @functions. *See* **Help***
Database fields, **229**
Database macro commands. *See* **Help***
Database records, **229**
  appending, 245
  deleting, 245
  editing, 244
  finding, 244–245
  sorting, 241
Database tables, **229**
  *See also* External database tables
  creating, 230–231
  guidelines, 230–231
  querying, 11, 231, **236**
  styling, 238
DataLens drivers, **247**
Date numbers, **79**
Dates
  entering, 78
  in formulas, 102
.DB files, 294
dBASE files, 294
dBASE IV, 247
.DBF files, 294
DDE links, **283**, 286
  compatibility, 297
@DDELINK, 287
Deactivating links, 289
Debugging macros, **260**, 276–278
Decimal places, 100
Decimal separator, 117
Defaults
  argument separator, 263
  chart, 159, 161
  chart name, 305
  currency format. *See* **Help***
  deleting, 160
  directory. *See* **Help***
  file names, 56
  file types, 55
  font. *See* **Help***
  international setting. *See* **Help***
  number format, 123
  page setting, 139
  sets of SmartIcons, 37
  setting. *See* **Help***
  sort order, 242
  Worksheet window. *See* **Help***

Deleting
@functions from @Function menu, 121
borders, 128
columns, 91
data, 82
drawn objects, 180
fields from query tables, 240
files, 317
*See also* **Help***
formulas, 318
frames, 128
links, 289
named styles, 132
page breaks, 146
passwords, 156
range names, 97
ranges, 92
records from database tables, 245
rows, 91
scenarios, 194
sets of SmartIcons, 256
styles, 83, 131
versions, 189
worksheet names, 61
worksheets, 59
Dependent variables
in regression analysis, **202**
predicting values for, 204
Dependents, cell. *See* **Help***
Designer frames, 127–128
*See also* **Help***
Dialog boxes, 48, 50–52
completing commands, 52
Dialog Editor, 279
*See also* **Help***
DIB format, **285**
Digits, significant, 302
Direction keys. *See* **Help***
Disconnecting from external database tables, 252
Disks backing up, 5
Displaying
@function menu, 36
control menu. *See* **Help***
data in query tables, 238
data values in charts, 161
decimal places, 100
external database tables, 248
hidden data, 136–137
link information. *See* **Help***
panes. *See* **Help***
percentages, values, and labels in charts. *See* **Help***
print previews, 141–143
range names, 96–98
results of @functions, 119
scenarios, 193
SmartIcons, 36, 254
Solver answers, 224
symbols in headers and footers, 144
values, 77, 132
versions, 187
worksheet tabs, 61
worksheets in perspective, 64
Distribution, frequency, **201**
Documentation, how to use, 1
Documenting macros, 261, 278
Documents. *See* Files
Dollar sign, 76, 101, 109
Drag-and-drop, turning on or off, 31
Dragging, 88
*See also* Moving
and copying, 86
and moving, 89
criteria, 234
Drawing. *See* Creating, Drawn objects
Drawn objects, **173**
colors. *See* **Help***
copying and moving, 179
creating, 173–179
fastening. *See* **Help***
flipping and rotating. *See* **Help***
grouping and ungrouping. *See* **Help***
hiding. *See* **Help***
locking and unlocking. *See* **Help***
printing, 140
selecting, 178
sizing and deleting, 180
Drop shadows. *See* **Designer frames**
Drop-down boxes, 51
*See also* **Help***
Dynamic Data Exchange. *See* DDE links

## E

Edges, changing. *See* **Help***
Edit commands
Arrange, 181
*See also* **Help***
Clear, 82, 131, 180, 317
Clear All, 268
Copy, 87, 111, 179, 269, 285, 286
Copy Down, 88
Copy Right, 88
Cut, 89, 179, 318
Delete, 59, 91, 317
Find & Replace, 83
Go To, 96, 168, 298
Insert, 59, 90
Insert Object, 12, 290
Links, 107, 286
Paste, 87, 90, 177, 179, 269, 291
Paste Link, 285
Paste Special, 111, 285, 291, 318
Undo, 53
Edit line, 36, 75
Editing
bitmaps for SmartIcons, 256
commands in Transcript window, 269
data, 75, 82
database records, 244
formulas, 111
in cells, 82
in contents box, 82
macro buttons, 272
macro commands, 265–268
macros, 276–278
text blocks, 177
Effects of inserting and deleting on formulas, 92
Ellipses (...), 48, 174–175
Embedded objects, 289–292
Ending
a 1-2-3 session, 40
macros, 267, 273
Enhanced @functions, 23
Enhanced macros, 28–29, 308
Enhancing
drawn objects, 180
pie charts. *See* **Help***

Enlarging printed data, 149
Entering
@functions, 118–119
cell addresses in formulas, 104
criteria, 231
data, 75–81
data in records, 230
dates and times, 78
formulas, 101–104
headers and footers, 143
LMBCS characters, 319–320
macros, 261
numbers, 76–77
range names in dialog boxes, 96–98
range names in formulas, 105
ranges in text boxes. *See* **Help***
text, 77–78
Erasing. *See* Deleting
Erasing program files, 4–5
ERR, 297, 300, 302
*See also* **Help***
in formulas, 103
in macro commands, 265
Errors
in formulas, 103
in macros, 276–277
Solver roundoff, **226**
Evaluating conditions with logical formulas, 100
Excel files, 294, 295–296
Exiting 1-2-3, 40
Exploding pie slices. *See* **Help***
Extended compose sequence, **319**, **320**
External database tables, **247**
*See also* Database tables
connecting to, 247
creating, 250
disconnecting from, 252
sending commands to, 251
Extracting data. *See* **Help***

## F

Fastening drawn objects. *See* **Help***
Field names, **229**
alias. *See* **Help***
Fields
combining criteria for, 233
database, **229**
naming, 230
File commands
Close, 68
Doc Info, 58
Exit, 40
New, 56
Open, 57, 196, 197
Page Setup, 144, 147
Print, 140
Print Preview, 141
Printer Setup, 139
Protect, 153, 197
Save, 196
Save As, 67, 155, 195, 197
Send Mail, 281
File links, 302
File name extensions
.ASC, 294
.BMP, 257
.CSV, 294
.DAT, 294
.DBF, 294
.IMX, 294
.MLB, 307
.NS4, 195, 294
.OUT, 294
.PRN, 294
.SMI, 256
.TXT, 294
.WK1, 106
.WK3, 106
.WK4, 56, 106
.WKS. *See* **Help***
.WRK. *See* **Help***
.WT4, 293
.XLS. *See* **Help***
.XLT, 294
.XLW, 294
File names
*See also* **Help***
changing, 67
default, 56
specifying, 67
File navigation keys, 63
{FILE-OPEN} and autoexecute macros, 275
File references, 106, 264
Files
*See also* **Help***; Worksheets
active, **55**
and memory management, 316–318
and passwords, 57, 155
attaching to mail, 282
changing default number format, 123
checking spelling, 85
client, 283
closing, 40, 68
combining, 317
*See also* **Help***
copying and moving formulas in, 108
creating, 55, 66
current, **55**
default names, 55
deleting. *See* Help*
Excel. *See* **Help***
extracting data. *See* **Help***
from other releases of 1-2-3, 55
limiting access to, 155
linking, 283
multiple-sheet, 38, 63
naming, 67
opening, 55–58, 293–295
parsing. *See* **Help***
printing, 139–152
README.TXT, 6
recently used. *See* **Help***
Release 1A. *See* **Help***
Release 2. *See* **Help***
Release 3. *See* **Help***
reservation. *See* **Help***
reserving, 58
*See also* **Help***
retrieving, 56–58
saving, 66–68, 293
sealing, **153**, 154
server, 283
sharing, 195–200
sharing with Release 2, 296–301
sharing with Release 3, 296–300
SOLVER.WK4, 224
styling, 66
swap, **318**

Symphony. *See* **Help***
text. *See* **Help***
transferring, 4
unsealing, 155
untitled, 37
using with Solver, 222–225
worksheet. *See* **Help***
Fill patterns. *See* **Help***
Filling ranges, 80
*See also* **Help***
by example, **81**
clearing excess data, **81**
using drag-and-fill, **80**
Finding
cell dependents. *See* **Help***
charts, 168
circular references. *See* **Help***
database records, 244
DDE links. *See* **Help***
file links. *See* **Help***
formula precedents. *See* **Help***
formulas. *See* **Help***
information about @functions, 121
information about links, 286–288
information about macros, 279
text, 83
Fitting data in columns, 132–134
*See also* **Help***
Flipping drawn objects. *See* **Help***
Fonts, **125**
Footers, adding, **143**
Formats
and memory management, 317
link, 285
number, 123, 301
*See also* **Help***
Formatting. *See* Styling
Formula, annotations, 301
Formulas, **99**
and memory management, 318
and undefined range names, 301
built-in. *See* @Functions
cell addresses in, 101
changing, 107
converting to results. *See* **Help***
copying, 108–112
copying and pasting results, 111
deleting, 318
entering, 101–103
errors in, 103
for statistical and financial @functions. *See* **Help***
guidelines, 101
in criteria, 232
long, 302
moving, 111
order of precedence, 107
performing special calculations. *See* @Functions
recalculating, 112
recalculation order, 107
*See also* **Help***
referring to other files in, 106–107
referring to ranges in, 104
Solver logical, **222**
types of, 99–100
updating, 112
Formulas, analyzing
3-variable what-if tables, **215**
cell dependents. *See* **Help***
circular references. *See* **Help***
file links. *See* **Help***
finding. *See* **Help***
formula precedents. *See* **Help***
using Backsolver, 209–210
FoxPro files, 294
Frames, adding, 127
Freehand drawing, 176
Freelance Graphics, 12
Freezing columns and rows as titles, 64–65
Frequency distribution, **201**
Function keys. *See* **Help***
@Function menu, 22, 36, 120–121
@Function selector, **36**
@Functions, 22–24, **115**
*See also* **Help***
arguments in, **116**
categories. *See* **Help***
compatibility, 300
customizing @Function menu, 120–121
database, 300
displaying Help on, 22
displaying results of, 119
enhanced, 23
entering, 118–119
entering dates and times with, 78
entering numbers in, 76
formats, 115
formulas for. *See* **Help***
in criteria, 232
*See also* **Help***
in formulas, 102, 115
in Solver problems, 227–228
*See also* **Help***
learning about individual, 121
*See also* ***Help**
parts of, 116
with LMBCS, 319


## G


Gallery. *See* **Help***
Goal seeking. *See* Backsolver
Graphical interface, 33
Graphics. *See* Drawn objects
Graphs. *See* Charts
Grid lines. *See* **Help***
Grouping
drawn objects. *See* **Help***
SmartIcons, 255
worksheets, 65–66
Guidelines
database table, 230–231
formulas, 101, 111
macro, 260, 265–268
range name, 94
worksheet name, 60


## H


Handles in drawn objects, **178**
Hard disk storage, 318
Hatch patterns. *See* **Help***; **Patterns**
Headers, adding, **143**
Height, row, 134–135
Help, 33
*See also* **Help***
on @functions, 22
on macro commands, 25
Hiding
cell contents, 301
charts. *See* **Help***
columns, 136–137

data, 135–137
drawn objects. *See* **Help***
parts of the 1-2-3 window. *See* **Help***
printed elements, 150
SmartIcons, 254
worksheet tabs, 61
worksheets, 136–137
Highlighting
current cell, 38
in dialog boxes, 51
High-Low-Close-Open (HLCO) charts, **165**


## I


Icon palette. *See* Sets of SmartIcons
Icons. *See* SmartIcons
Identifying worksheets, 38
Importing files. *See* **Help***
Importing pictures, 177
.IMT files, 294
Independent variables in regression analysis, **202**
Indicators
mode, **39**
selection, 36
Info components. *See* **Help***
Information boxes, 51
Input, cells and values in what-if tables, **213**
Input ranges, 298–299
Inserting
columns, 90–92
objects, 289–292
ranges, 91
rows, 90–92
worksheets, 38, 59–60
Insertion point, 75
Install program, 5
Installing 1-2-3
on a network node, 5–6
on a stand-alone computer, 5
optional features, 6
Intercept, Y-axis in regression analysis. *See* **Help***
Interface, graphical, 33
International settings. *See* **Help***
Inverting matrixes. *See* **Help***
Invisible. *See* Hiding
Invoking add-ins. *See* **Help***
Iteration, Solver, **221**


## J


Joining database tables. *See* **Help***


## K


Keyboard shortcuts for commands. *See* **Help***
Keys
*See also* **Help***
extra sort, 302
file navigation, 63
function. *See* **Help***
pointer-movement. *See* **Help***
sort, **241**
Worksheet navigation, 63–68
Keywords, macro command, **262**, 266


## L


Label-prefix characters, **77**, 230
Labels, **77**
and range names, 95
chart axis. *See* **Help***
checking spelling of, 84–85
displaying on macro buttons, 271
field name, 230
legend. *See* **Help***
long, 78, 302
on macro buttons. *See* **Help***
pie charts. *See* **Help**
Landscape printing, **150**
Libraries, macro, 260, **261**
Limiting access to files, 155
Line charts, **163**
Linear regression analysis, multiple, 202
Lines
changing. *See* **Help***
creating, 174
grid. *See* **Help***
Linking, files, 302
Links
*See also* **Help***
between applications, 284–286
creating, 284
DDE, 283, 286
deactivating, 289
deleting, 289
editing, 288–289
file, **283**
formats, 284–285
formulas, **106**
OLE, 283, 286
updating, 289
List boxes, 51
LMBCS codes
entering, 319–321
tables of, 321–332
Loading add-ins. *See* **Help***
Location arguments, 117, 263
Locking drawn objects. *See* **Help***
Log files
Excel translation, 295
macro translation, 304
Logical formulas, **100**
Solver, **222**
Logical operators, **101**, 117, 233, 265
Long labels, 78, 140
Lotus Multibyte Character Set, 319
Lotus Notes, 11, 247, 294
Lotus Notes server, 195


## M


Macro buttons, 270–272
selecting, 178
Macro commands
arguments, 262–265
creating, 262
keywords, **262**, 266
syntax, **262**, 265–267
Macro libraries, 260, **261**
Macro trace window, Debugging macros. *See* **Help***
Macro Translator, 302–306
Macros, **259**
*See also* **Help***
1-2-3 for DOS, 307
1-2-3 for Macintosh, 310–313
{ALT} keystroke, 302
and F3 (NAME). *See* **Help***
assigning to buttons, 270–272
autoexecute, **275**

copying from the Transcript window, 269
creating, 313
debugging, **260**, 276–278
displaying Help on, 25
documenting, 278
editing in Transcript window, 269
enhanced, 308
enhancements, 28–29
entering, 261
errors in, 276–277
guidelines, 260, 265–268
learning about individual, 279
*See also* **Help***
naming, 270
new commands, 24
problems with, 308–310
protecting, 261
recalculating, 274
recording, 268
running, 261, 272–273, 307
saving, 278
self-modifying, 306
stopping, 267, 273
Trace window, 277–278
Transcript window, **262**, 268
translating 1-2-3 for Windows, 302–306
types of, 270
writing and editing, 265–267
Mail, sending, 281–283
Main menu, 35, **47**
Manipulating, windows. *See* **Help***
Manual links, **284**
Manual recalculation, 112, 274
Maps, 170–171
Margins, print, 148–149
Marks, tick. *See* **Help***
Mathematical operators, **101**
Matrixes
3D, 206
analyzing, **205**
inverting. *See* **Help***
multiplying. *See* **Help***
Maximize button. *See* **Help***
Maximizing windows, 45
Memory management
and Undo, 318
out of memory, 316
Memory, requirements for 1-2-3, 2
Menu bar, 35, **47**
Menu commands, 47
Menus
@Function, 22
choosing, 47
Control, 45
Main, 1-2-3, 35, **47**
1-2-3 Classic, 41, 53
*See also* **Help***
pull-down, **47**
quick, 49
recording commands in macros, 268
right mouse button, 49
Merging versions and scenarios, 198
Messages
1-2-3. *See* **Help***
mail, 281–283
Metafile format, 285
Microsoft, Excel files, 294, 295–296
Minimize button, 35, 45
Minimizing windows, 45
Minus sign beginning formulas, 101
Mistakes, correcting, 53
Mixed charts, **164**
Mixed references in formulas, **109**, 110–111
.MLB file, copying macros from, 307
Modifying
*See also* Changing
links, 288–289
macro buttons, 272
scenarios, 193
SmartIcons, 255–258
versions, 188–189
Mouse, 42
displaying quick menus, 49
selecting columns and rows, 73
selecting worksheets, 74
with macros, 268
Mouse pointer, **42**
Moving
among database records, 244
around a worksheet, 62–63
between files, 63
between Version Manager and Index, 186
between worksheets, 39, 63
chart titles and footnotes. *See* **Help***
columns, 89
data, 88–90
data affecting formulas, 111
drawn objects, 179
formulas, 108
sets of SmartIcons, 254
windows, 45
Multiple criteria, 233–234
Multiple linear regression analysis, **202**
Multiple-character name, macro, **270**
Multiple-worksheet files, 38, 63–66
Multiplying matrixes. *See* **Help***


## N


NA, 297, 300
in Macro arguments, 265
Named, charts, 298
Named page settings, printing, 150–152
Named ranges, 93–98
*See also* Range names
Named styles, 131
Names, field, **229**
Naming
charts, 168
fields, 230
files. *See* **Help***
macro buttons, 271
macros, 270
query tables, 240
ranges, 93–95
worksheets, 34, 39, 60–61
Navigator, **36**
Negative numbers, 77
Negative values in pie charts, 301
Nested parentheses, **101**, 108
Network nodes, installing on, 5–6
Networks, shared files on, 197
New Sheet button, 59
Nonbinding constraints, Solver. *See* **Help***

#NOT#, logical operators
in formulas, 100
in macros, 265
Notepad, 295, 304
Notes, Lotus, 11, 247, 294
.NS4 extensions, 195
.NS4 (shared) files, **294**
Number formats, **123**, 301
*See also* **Help***
changing, **123**
Number signs beginning formulas, 101
Numbers
date and time, **79**
entering, 76–77
negative, 77
summing, 115
Numeric formulas, **99**

## O

Object Linking and Embedding. *See* OLE link
Objects, drawn, **173**
Objects, inserting, 289–292
OLE link, **283**, 286, 290, 292
1-2-3 for DOS
macros, 307
sharing files with, 296–301
1-2-3 for Macintosh macros, 310–313
1-2-3 keys, 53
1-2-3 package contents, 1
1-2-3 window. *See* **Help***
123WXMAC.LOG file, 304
1-variable what-if table, **212**
Open parentheses beginning formulas, 101
Opening
cells, **315**
worksheets and memory management, 317
worksheets with autoexecute macros, 275
Opening files, 55–58, 293–295
recently used. *See* **Help***
Operands in formulas, **101**
Operators, 108
and precedence order, 107
in criteria, **101**
in formulas, **101**
logical, 117, 265
Optimal cells, Solver, **223**
Optimal recalculation, **112**
Option buttons, 50, 51
#OR#, logical operators
in criteria, 233
in formulas, 100
in macros, 265
Order of precedence in formulas, 107–108
Ordering. *See* Sorting
.OUT files, 294
Out of memory, 316
Output range in regression analysis, **202**
Output ranges, 298–299
Ovals. *See* Ellipses

## P

Page breaks, adding and removing, 145–146
Page settings
customizing, 148
default, 139
Panel, control, 35
Panes, displaying. *See* **Help***
Paradox, 247
Paradox files, 294
Parentheses
enclosing @function arguments, 108
enclosing arguments, **117**
nested, **101**
Parsing data. *See* **Help***
Parts
of a formula, 101
of a macro command, 262–263
of an @function, 116
Parts of the 1-2-3 window. *See* **Help***
Passwords, 154
and file-protection, **155**
deleting, 156
translating files with, 325
Pasting
*See also* Copying; Moving
data. *See* **Help***
formula results, 111
macros, 269
styles, 130
Patterns, 126, 172
*See also* **Help***
Periods
as argument separators, 116, 265
as decimal separators, 117
beginning formulas, 101
Perspective view, 64
Picture format, **285**
Pictures, pasting into worksheets, 177
Pie charts, **165**
enchancing. *See* **Help***
negative values in, 301
Pie slices, labels in. *See* **Help***
Planning macros, 260
Plotting data, **157**
Plus signs
beginning formulas, 101
entering dates or times, 143
@PMT, formula for, 213
Point size. *See* Fonts
Pointer-movement keys. *See* **Help***
Pointers
cell, 38, 62, **69**, 76
mouse, **42**
Points, data, **163**
Poking data, 310
Polygons, creating, **175**
Polylines, creating, **175**
Portrait printing, **150**
Precedence numbers, **107**
Precedents, formula. *See* **Help***
Predicting trends, 203–204
Previewing, 141–143
Print margins, 148–149
Print Preview window, 141
Print settings
named, 301
in .WK1 or .WK3 files, 300
Print titles, 146–148
Printers. *See* **Help***
Printing
centering data, 148–150
changing page orientation, 150

charts, 140
collections, 140
columns, 146
current worksheet, 140
drawn objects, 140
files, 140
headers and footers, 143
hiding worksheet elements, 150
named page settings, 150–152
page breaks, 145–146
page numbers, 143
previewing worksheets, 141–143
query tables, 140
ranges, 140
shrinking and enlarging data, 149–150
worksheets, 139
zooming previews, 141–143
.PRN files, 294
Problems, macro-related, 308–310
Product updates, 6
Program files, erasing, 4–5
Programming. *See* Macros
Protecting
data, 153
files with passwords, 57
macros, 261
Pull-down menus, **47**


## Q


Query commands
Aggregate, 246
Join. *See* **Help***
Refresh, 242
Show SQL, 246
Query options. *See* **Help***
Query tables, 11, **236**
checking spelling in, 84–86
choosing fields in, 240
creating, 236
naming, 240
printing, 140
selecting, 37
setting criteria, 238
sorting, 241
styling, 238
updating, 242
{QUERY-UPGRADE}, 298
Querying database tables, 11, 298–299
Question marks, as wildcard characters, 235
Quick menus, 49
Quick printing, 139
{QUIT}, stopping macros with, 267
Quitting 1-2-3, 40
Quotation marks
in macro commands, 263, 266, 267
in text formulas, 102, 117


## R


R squared in data regression, **203**
Radar charts, **167**
Radio buttons, Option buttons. *See* **Help***
Range addresses, **70**, 93
Range commands
Analyze. *See* **Help***
Fill, 81
Fill by Example, 80
Name, 95, 197, 231, 245, 270
Parse. *See* **Help***
Sort, 241
Transpose. *See* **Help***
Version, 185, 187
Range names, **93**
and labels, 95
deleting, 97
displaying. *See* **Help***
entering in dialog boxes, 96
guidelines, 94
in formulas, 105
in macro command arguments, 264
undefined, 301–302
Ranges, **70**
3D, **70**, 81
and memory management, 317
changing colors and patterns in, 126
criteria, 298–299
data. *See* **Help***
deleting, 92
filling, 80
*See also* **Help***
hiding data in, 135–137
in what-if tables, 213
input, 298–299
inserting, 91
link destination, 287
naming, 93–95
output, 298–299
printing, 140
referred to in formulas, 104
reprotecting, 155
reshaping selections for, 72
routing, 282–283
selecting, 70–72
transposing, 301
X, Y, output, in regression analysis, 202
README.TXT file, 6
Rearranging data. *See* **Help***
{RECALC} and {RECALCCOL} macro commands, 274
Recalculation
and macros, 274
formulas, 107
optimal, **112**
order of precedence, 112
*See also* **Help***
Recording a macro, 268
Records, database, **229**
editing, 244
finding, 244
sorting, 241
Rectangles, creating, 174–175
Reduced print size, 149
References
circular. *See* **Help***
file, 106, 264
in formulas, **104**
to other files in formulas, 106
Refreshing shared files, 196
Regaining system memory, 316
Regression analysis, **202**
Relative references in formulas, **108**, 109
Release 2, sharing files with, 296–301
Release 3, sharing files with, 296–300
Release 3.1 menu. *See* **Help***
Removing. *See* Deleting, Hiding
Removing add-ins. *See* **Help***
Removing copy protection, 4

Renaming
charts, 168
query tables, 240
Replacing, text, 83
Reports
Solver, 227
Version Manager, 190–191
Reprotecting ranges, 155
Reservation, file, 58
*See also* **Help***
Reshaping files, 57
*See also* Opening files
Restore button, 35, 45
Restoring windows, 45
Restrictions, translation, for macros, 304–307
Retrieving files. *See* Opening files
Returning
to the Install program, 6
to the most recently used file. *See* **Help***
Reversing actions. *See* Undoing actions
Right alignment, 77
Right mouse button, 49–50
Rotating
drawn objects. *See* **Help***
text in cells, 130
Rounding values, 77, 100
Roundoff errors, Solver, **226**
Routing ranges, 282–283
Rows
adding, 90–92
changing heights of, 134–135
deleting, 91
freezing as titles, 64–65
moving, 89
plotting in charts, 158
selecting, **73**
Running macros, 272–273
from macro libraries, 261
Release 2 and 3, 307

## S

Saving
and memory management, 317
autosave. *See* **Help***
changes, 40
files, 66–68, 293
macros, 278
page settings, 150–152
Sets of SmartIcons, 255
Solver answers, 225
*See also* Version Manager
Scales, chart axis. *See* **Help***
Scatter charts, **165**
Scenarios, 10–11, **184**
*See also* Versions
compatibility, 297
creating, 192–193
deleting, 194
displaying and modifying, 193
merging, 198–200
sharing, 195
Scientific notation. *See* **Help***
Screen, parts of display, 34
Scripting. *See* Macros
Scroll bars, 62
Sealing files, **153**, 154
Search and replace, 83–84
Selecting
3D ranges, 70
cells, 69
charts, 160, 167
check boxes. *See* **Help***
collections, **72**
columns, 73
drawn objects, 178
items from boxes. *See* **Help***
link formats, 284–285
macro buttons, 178
named ranges, 96
number formats, 124
option buttons. *See* **Help***
query tables, 237
ranges, 70–72, 244
recently used files. *See* **Help***
records, 231, 244
references, 109
rows, 73
SmartIcons, 37, 253
the Undo option, 53
worksheets, 74
Selection indicator, 36
Selector, @function, **36**
Self-modifying macros, 306
Semicolons, as argument separators, 116, 263, 265
Sending commands to external database tables, 251
Sending mail, 281
Sensitivity analysis. *See* What-if tables
Separators
argument, **116**, **263**
formula, **101**
Sequence, compose, **319**
Series, data, **158**
*See also* **Help***
Server applications, **283**
Servers, Lotus Notes, 195
Sets of SmartIcons, 36, 253–257
*See also* **Help***
Setting
chart axis scale. *See* **Help***
criteria for query tables, 238
defaults. *See* **Help***
fill patterns. *See* **Help***
macro recalculations, 275
protection, 153–156
query options. *See* **Help***
tick marks and axis labels in charts. *See* **Help***
view preferences. *See* **Help***
Setting up
1-variable what-if table, 212
2-variable what-if table, 214
3-variable what-if tables, 216
database tables, 229
regression analysis, 203
Solver constraints, **222**
Shared (.NS4) files, **294**
Sharing
files on a network, 197–198
files with Release 2, 296–301
files with Release 3, 296–300
versions and scenarios, 195–200
Sheets. *See* Worksheets
Shortcuts
keyboard for commands. *See* **Help***
right mouse button, 49–50
Showing. *See* Displaying

Shrinking
printed data, 149–150
worksheet display, 64
Shuffling drawn objects. *See* **Help***
Sideways printing, 150
Significant digits, 302
Sizing
charts, 9
columns, 132–134
rows, 134
SmartIcons, 254
text blocks, 176
windows, 45
Slash (/) with 1-2-3 Classic, 53
SmartIcons, 36, 253–258
*See also* **Help***
assigning macros to, 258
creating bitmaps for, 256
default sets, 37
editing bitmaps for, 256
selecting, 37, 253
SmartMaster templates, 55–56
SmartPak, 305
.SMI extension, 256
Solver
answers, 224, 225–226
capabilities, 219–221
defining problems, 222
example button, 225
examples, 221
multiple worksheets and files, 222
reports, 227
sample file, 224
symbolic and numeric techniques, 221
SOLVER.WK4 file, 224
Sort keys, **241**
extra, 302
Sort orders, **242**
*See also* **Help***
Sorting
database records, 241
versions, 185, 191
Spaces, in formulas, 102
Specifying. *See* Selecting
Spelling
checking, 84–85
dictionaries. *See* **Help***
errors in macros, 276
Splitting worksheets, 63
Spreadsheets. *See* Worksheets
SQL commands. *See* **Help***
SQL Server, 247
Squares. *See* Rectangles
Stacked and Standard bar charts, **162**
Starting
1-2-3, 33–34
Step and Trace modes. *See* **Help***
Status bar, 39
Step mode, 277
Stock market charts. *See* High-Low-Open-Close (HLCO) charts
Stopping macros, 273
Storing
disks, 318
macros, 261
Strings, combining, 100
Structuring files, 316
Style commands
Alignment, 129
Column Width, 133
Fast Format, 131
Font & Attributes, 125, 177
Gallery. *See* **Help***
Hide, 136
Lines & Color, 126, 177, 181
Named Style, 132
Number Format, 124, 136
Page Break, 145
Protection, 154, 197
Row Height, 134
Worksheet Defaults, 66, 124
Styles
changing. *See* **Help***
color. *See* **Help***
copying, 130–131
deleting, 83, 130–131
named, 131
patterns, 126
templates. *See* **Help***
Styling
and Group mode, 123
charts, 169
compatibility, 299
drawn objects, 181–182
query tables, 238
worksheets, 123–131
@SUM, formula for, 115
Swap file, **318**
Symbols. *See beginning of index*
Symphony files, 293, 294
Syntax
@function, 115–117
formula, 101–104
macro command, **262**, 265–267
System requirements, 2

## T

Table ranges in what-if tables, 213
Tables
database, 229
external database, **247**
query, **236**
what-if, 211
Tabs, worksheet, **39**, 60
hiding and showing. *See* **Help***
Templates, SmartMaster, 55–56
Templates, style. *See* **Help***
Text
aligning, 129–130
checking spelling of, 84–86
copying, 86–88
deleting. *See* **Help***
editing, 82
entering in cells, 75
finding and replacing, 83–84
in macros, 267
moving, 88–90
styling, 125–126, 129–130
Text arguments, **117**, **263**
Text attributes, **125**
Text blocks, 176
Text boxes, 51
Text files. *See* **Help***
Text format, **285**
Text formulas, **100**
Text operators, **101**
3D charts, 160
3D matrixes, 206
3D ranges, **70**
selecting, 70–72
3-variable what-if table, **215**

Tick marks, setting. *See* **Help***
Tiling windows, **46**
Time numbers, **79**
Times, entering, 78
Title bar, **35**, 47, 50
Titles
  chart, 159
  clearing, 65
  for printing, 146–147
  freezing, 64–65
Tool bar. *See* SmartIcons
Tools commands
  Add-in. *See* **Help***
  Audit. *See* **Help***
  Chart, 9, 160
  Database, 243, 245, 247, 248
  Database New Query, 11
  Draw, 176
  Macro, 268, 272, 273
  Map, 171
  SmartIcons, 253
  Spell Check, 84
  User Setup, 66, 76, 112, 275, 318
Trace mode, 277
Transcript, window, 313
Transcript commands, Make Button, 271
Transcript window, 268
  editing commands in, 269
  running macros from, 273
Transferring data, 4, 281
Translating
  {ALT} keystroke macros, 302–306
  Excel files, 295–296
Translation restrictions, for macros, 304–307
Translator, Macro, 302–306
Transposing data. *See* **Help***
Transposing ranges, 301
Turning on and off
  automatic format. *See* **Help***
  beep on error. *See* **Help***
  drag-and-drop. *See* **Help***
  Undo, 53
2-variable what-if table, **214**
.TXT files, 294
Typeface. *See* Fonts

## U

Undefined range names, 301–302
Undoing actions
  *See also* **Help***
  effect on memory, 318
Ungrouping
  *See also* **Help***
  drawn objects. *See* **Help***
  worksheets, 66
Unit titles, chart. *See* **Help***
Unlocking drawn objects. *See* **Help***
Untitled worksheet, 37–39
Updating
  database tables, 243
  file links, 107
  formulas, 112
  links, 289
  query tables, 242
  versions, 189
Upright printing, 150
User, name, 31

## V

Value arguments, **117**, **263**
Values, **76**
  *See also* Numbers
  data in charts, 161
  displaying, 77, 132
  in formulas, 101
  long, 302
  ranges in frequency distribution, 201
  Solver negative, 226
Variables, dependent, predicting values for, 204
Version Manager, 10–11, 183, 185
  *See also* Scenarios
  Index, **185**
  Information @functions. *See* **Help***
  window, **42**, 183
Versions
  compatibility, 297
  creating, 186–187
  deleting, 189
  displaying, 187
  merging, 198–200
  modifying settings, 188
  reports of, 190–191
  sharing, 195
  sorting, 185, 191
  updating, 189
Vertical bar. *See* Insertion point
View commands
  Clear Titles, 65
  Custom, 64
  Freeze Titles, 65
  Set View Preferences, 61, 64
    *See also* **Help***
  Split, 64
  Zoom In, 64
  Zoom Out, 64
Viewing. *See* Displaying
Visual effects. *See* Drawn objects

## W

What-if tables, 211
  1-variable, **212**
  2-variable, **214**
  3-variable, **215**
  charting, 217
  input values. *See* **Help***
Whisker HLCO chart, **166**
Width, column, 132
Wildcard characters, **235**
Window, Transcript, 313
Window commands
  Cascade, 46
  Tile, 46
Window, active, 35
Windows
  and memory management, 317
  cascading, 46
  closing, 45
  File Manager, 318
  maximizing, 45
  minimizing, 45
  moving, 45
  Print Preview, 141
  restoring, 45
  sizing, 45
  tiling, 46
  Transcript, **262**, 268

types of, 41
Version Manager, 185
Worksheet, 34
Windows Control Panel, 30
.WK1 extension, 106
.WK3 extension, 106
.WK4 extension, 56, 106
.WKS extension. *See* **Help***
.WK1 files, 293, 294, 296–301
.WK3 files, 293, 294, 296–300
.WKS files, 293
Worksheet files. *See* **Files**
Worksheet names, 60–61
Worksheet navigation keys, 63
Worksheet tabs, 34, **39**, **60**
Worksheet window, **37**
default. *See* **Help***
displaying, 63–64
Worksheet, current, **38**
Worksheets
adding, 38, 59–60
and database tables, 230
and memory management, 316
auditing, 113–114
*See also* **Help***
checking spelling, 85
color in. *See* **Help***
copying and moving formulas in, 108
default settings. *See* **Help***
deleting, 59
editing, 59
enlarging, 149
entering macros in, 261
grouping, 65–66
hiding data in, 135–137
identifying, 38
importing pictures, 177
in perspective view, 65–66
inserting, 38, 59–60
moving around, 62
moving between Version Manager and Index, 186
naming, 34, 39, 60–61
previewing, 141–143
printing, 139–152
protecting, 153
saving, 66–68
selecting, 74
shrinking, 149
styling, 123–132
ungrouping, 66
untitled, 37–39
using with Solver, 222
zooming displays of, 64
.WR1 files, 293, 294
Wrapping text in cells, 130
Writing macros, 265–267
.WRK extension. *See* **Help***
.WRK files, 293, 294
.WT4 files, 293
Wysiwyg menu, **53**
*See also* **Help***


## X


X-axis, chart, **157**
X-range in regression analysis, 202
.XLS extension. *See* **Help***
.XLS files, 294, 295–296
XY charts, **165**


## Y


Y-axis, chart, **157**
Y-intercept in regression analysis. *See* **Help***
Y-range in regression analysis, **202**


## Z


Zooming
panes. *See* **Help***
printed data, 141–143
worksheet displays, 64