

Contents at a Glance

Preface	vii
-------------------	-----

Part I: Getting Started with Excel 1

Chapter 1: Introducing Excel	3
Chapter 2: Entering and Editing Worksheet Data	25
Chapter 3: Essential Worksheet Operations	43
Chapter 4: Working with Cells and Ranges	63
Chapter 5: Worksheet Formatting	85
Chapter 6: Understanding Files and Templates	105
Chapter 7: Printing Your Work	121

Part II: Working with Formulas and Functions 139

Chapter 8: Introducing Formulas and Functions	141
Chapter 9: Creating Formulas That Manipulate Text	169
Chapter 10: Working with Dates and Times	189
Chapter 11: Creating Formulas That Count and Sum	221
Chapter 12: Creating Formulas That Look Up Values	249
Chapter 13: Creating Formulas for Financial Applications	269
Chapter 14: Introducing Array Formulas	295
Chapter 15: Performing Magic with Array Formulas	317

Part III: Creating Charts and Graphics 337

Chapter 16: Getting Started Making Charts	339
Chapter 17: Learning Advanced Charting	373
Chapter 18: Enhancing Your Work with Pictures and Drawings	419

Part IV: Analyzing Data with Excel 435

Chapter 19: Working with Lists	437
Chapter 20: Using External Database Files	463
Chapter 21: Analyzing Data with Pivot Tables	479
Chapter 22: Performing Spreadsheet What-If Analysis	501
Chapter 23: Analyzing Data Using Goal Seek and Solver	515
Chapter 24: Analyzing Data with the Analysis ToolPak	531

Part V: Using Advanced Excel Features 543

Chapter 25: Using Custom Number Formats	545
Chapter 26: Customizing Toolbars and Menus	563
Chapter 27: Using Conditional Formatting and Data Validation	575
Chapter 28: Creating and Using Worksheet Outlines	591
Chapter 29: Linking and Consolidating Worksheets	599
Chapter 30: Excel and the Internet	613
Chapter 31: Sharing Data with Other Applications	623
Chapter 32: Using Excel in a Workgroup	639
Chapter 33: Making Your Worksheets Error-Free	651

Part VI: Programming Excel with VBA 677

Chapter 34: Introducing Visual Basic for Applications	679
Chapter 35: Creating Custom Worksheet Functions	703
Chapter 36: Creating UserForms	715
Chapter 37: Using UserForm Controls in a Worksheet	733
Chapter 38: Working with Excel Events	745
Chapter 39: VBA Examples	757
Chapter 40: Creating Custom Excel Add-Ins	773

Part VII: Appendixes 785

Appendix A: Worksheet Function Reference	787
Appendix B: What's on the CD-ROM	803
Appendix C: Just for Fun	815
Appendix D: Additional Excel Resources	837
Appendix E: Excel Shortcut Keys	845

Index	853
End-User License Agreement	899

Contents

Preface	vii
-------------------	-----

Part I: Getting Started with Excel 1

Chapter 1: Introducing Excel 3

What Is It Good For?	3
Understanding Workbooks and Worksheets	4
Moving Around a Worksheet	6
Navigating with your keyboard	7
Navigating with your mouse	8
Using the Excel Menus and Toolbars	9
Using menus	9
Using shortcut menus	11
Using shortcut keys	12
Using toolbars	12
Working with Dialog Boxes	14
Understanding dialog box controls	14
Navigating dialog boxes	15
Using tabbed dialog boxes	16
Creating Your First Excel Worksheet	17
Getting started on your worksheet	18
Filling in the month names	18
Entering the sales data	19
Summing the values	19
Making your worksheet look a bit fancier	20
Creating a chart	21
Printing your worksheet	22
Saving your workbook	22

Chapter 2: Entering and Editing Worksheet Data 25

Understanding the Types of Data You Can Use	25
Understanding numerical values	26
Understanding text entries	26
Understanding formulas	27
Entering Text and Values into Your Worksheets	27
Entering Dates and Times into Your Worksheets	28
Entering date values	29
Entering time values	29

Modifying Cell Contents	30
Erasing the contents of a cell	30
Replacing the contents of a cell	30
Editing the contents of a cell	31
Learning some handy data-entry techniques	32
Applying Number Formatting	37
Improving readability by formatting numbers	37
Adding your own custom number formats	42
Chapter 3: Essential Worksheet Operations	43
Learning the Fundamentals of Excel Worksheets	43
Working with Excel's windows	43
Making a worksheet the active sheet	46
Adding a new worksheet to your workbook	47
Deleting a worksheet you no longer need	48
Changing the name of a worksheet	48
Changing a sheet tab's color	49
Rearranging your worksheets	49
Hiding and unhiding a worksheet	51
Controlling the Worksheet View	52
Viewing a worksheet in multiple windows	52
Comparing sheets side by side	53
Splitting the worksheet window into panes	54
Keeping the titles in view by freezing panes	54
Zooming in or out for a better view	55
Saving your view settings	57
Monitoring cells with a Watch Window	58
Working with Rows and Columns	58
Inserting rows and columns	59
Deleting rows and columns	60
Hiding rows and columns	60
Changing column widths and row heights	61
Chapter 4: Working with Cells and Ranges	63
Understanding Cells and Ranges	63
Selecting ranges	64
Selecting complete rows and columns	65
Selecting noncontiguous ranges	65
Selecting multisheet ranges	66
Selecting special types of cells	68
Copying or Moving Ranges	71
Copying by using toolbar buttons	72
Copying by using menu commands	73
Copying by using shortcut keys	73
Copying by using drag-and-drop	73
Copying to adjacent cells	74
Copying a range to other sheets	75
Using the Office Clipboard to paste	76
Pasting in special ways	77

Using Names to Work with Ranges	79
Creating range names in your workbooks	80
Creating a table of range names	82
Modifying existing range names	82
Adding Comments to Cells	83
Chapter 5: Worksheet Formatting	85
Getting to Know the Formatting Tools	85
Using the Formatting toolbar	86
Using the Format Cells dialog box	86
Using Formatting in Your Worksheets	87
Using different fonts	87
Changing text alignment	90
Using colors and shading	94
Adding borders and lines	95
Adding a background image to a worksheet	96
Using AutoFormat for quick and easy worksheet formatting	97
Using Named Styles for Easier Formatting	98
Applying styles to your worksheets	100
Creating new styles	101
Modifying a style to meet your needs	102
Merging styles from other workbooks	102
Controlling styles with templates	103
Chapter 6: Understanding Files and Templates	105
Understanding Excel Files	105
Creating a new workbook	105
Opening an existing workbook	107
Saving and closing your workbooks	110
Using AutoRecover	111
Safeguarding your work	114
Understanding Excel Templates	115
Working with the default templates	116
Creating custom templates	118
Chapter 7: Printing Your Work	121
Printing with One Click	121
Adjusting Your Print Settings for Better Results	122
Adjusting the settings in the Print dialog box	122
Adjusting the Page Setup settings	125
Controlling where pages break in your printouts	132
Preventing certain cells from being printed	132
Using Print Preview	133
Viewing the print preview	133
Changing print settings while previewing	134
Using Page Break Preview mode	135
Creating custom views of your worksheet	137

Part II: Working with Formulas and Functions 139

Chapter 8: Introducing Formulas and Functions 141

Understanding Formula Basics	141
Using operators in formulas	142
Understanding operator precedence in formulas	143
Using functions in your formulas	145
Entering Formulas into Your Worksheets	147
Entering formulas manually	148
Entering formulas by pointing	148
Pasting range names into formulas	148
Inserting functions into formulas	149
Function entry tips	150
Editing Formulas	151
Using Cell References in Formulas	152
Using relative, absolute, and mixed references	152
Changing the types of your references	154
Referencing cells outside the worksheet	155
Correcting Common Formula Errors	156
Handling circular references	157
Changing when formulas are calculated	159
Using Advanced Naming Techniques	160
Using names for constants	161
Using names for formulas	161
Using range intersections	162
Applying names to existing references	164
Tips for Working with Formulas	165
Don't hard-code values	165
Using the formula bar as a calculator	165
Making an exact copy of a formula	166
Converting formulas to values	166

Chapter 9: Creating Formulas That Manipulate Text 169

A Few Words about Text	169
How many characters in a cell?	169
Numbers as text	170
Text Functions	171
Determining whether a cell contains text	171
Working with character codes	171
Determining whether two strings are identical	173
Joining two or more cells	173
Displaying formatted values as text	175
Displaying formatted currency values as text	176
Repeating a character or string	176
Creating a text histogram	177

Padding a number	178
Removing excess spaces and nonprinting characters	179
Counting characters in a string	179
Changing the case of text	179
Extracting characters from a string	180
Replacing text with other text	181
Finding and searching within a string	182
Searching and replacing within a string	182
Advanced Text Formulas	183
Counting specific characters in a cell	183
Counting the occurrences of a substring in a cell	183
Extracting a filename from a path specification	184
Extracting the first word of a string	184
Extracting the last word of a string	184
Extracting all but the first word of a string	185
Extracting first names, middle names, and last names	185
Removing titles from names	187
Counting the number of words in a cell	187

Chapter 10: Working with Dates and Times 189

How Excel Handles Dates and Times	189
Understanding date serial numbers	189
Entering dates	190
Understanding time serial numbers	192
Entering times	194
Formatting dates and times	195
Problems with dates	196
Date-Related Functions	198
Displaying the current date	199
Displaying any date	199
Generating a series of dates	200
Converting a non-date string to a date	201
Calculating the number of days between two dates	202
Calculating the number of workdays between two dates	203
Offsetting a date using only workdays	204
Calculating the number of years between two dates	204
Calculating a person's age	205
Determining the day of the year	206
Determining the day of the week	206
Determining the date of the most recent Sunday	207
Determining the first day of the week after a date	207
Determining the n^{th} occurrence of a day of the week in a month	207
Calculating dates of holidays	208
Determining the last day of a month	210
Determining whether a year is a leap year	211
Determining a date's quarter	211

Time-Related Functions	211
Displaying the current time	212
Displaying any time	212
Calculating the difference between two times	213
Summing times that exceed 24 hours	214
Converting from military time	217
Converting decimal hours, minutes, or seconds to a time	217
Adding hours, minutes, or seconds to a time	218
Rounding time values	219
Working with non-time-of-day values	219
Chapter 11: Creating Formulas That Count and Sum	221
Counting and Summing Worksheet Cells	221
Basic Counting Formulas	223
Counting the total number of cells	224
Counting blank cells	225
Counting nonblank cells	225
Counting numeric cells	226
Counting nontext cells	226
Counting text cells	226
Counting logical values	226
Counting error values in a range	226
Advanced Counting Formulas	227
Counting cells by using the COUNTIF function	227
Counting cells by using multiple criteria	228
Counting the most frequently occurring entry	231
Counting the occurrences of specific text	232
Counting the number of unique values	234
Creating a frequency distribution	235
Summing Formulas	239
Summing all cells in a range	240
Computing a cumulative sum	241
Summing the “top <i>n</i> ” values	242
Conditional Sums Using a Single Criterion	242
Summing only negative values	243
Summing values based on a different range	244
Summing values based on a text comparison	245
Summing values based on a date comparison	245
Conditional Sums Using Multiple Criteria	245
Using And criteria	246
Using Or criteria	247
Using And and Or criteria	247
Chapter 12: Creating Formulas That Look Up Values	249
Introducing Lookup Formulas	249
Functions Relevant to Lookups	250

Basic Lookup Formulas	252
The VLOOKUP function	252
The HLOOKUP function	253
The LOOKUP function	254
Combining the MATCH and INDEX functions	255
Specialized Lookup Formulas	257
Looking up an exact value	257
Looking up a value to the left	258
Performing a case-sensitive lookup	260
Choosing among multiple lookup tables	260
Determining letter grades for test scores	261
Calculating a grade-point average	262
Performing a two-way lookup	263
Performing a two-column lookup	265
Determining the cell address of a value within a range	266
Looking up a value by using the closest match	267
Chapter 13: Creating Formulas for Financial Applications	269
The Time Value of Money	269
Loan Calculations	270
Worksheet functions for calculating loan information	271
A loan calculation example	274
Credit card payments	275
Creating a loan amortization schedule	277
Summarizing loan options by using a data table	279
Calculating a loan with irregular payments	282
Investment Calculations	283
Future value of a single deposit	284
Future value of a series of deposits	288
Depreciation Calculations	290
Chapter 14: Introducing Array Formulas	295
Understanding Array Formulas	295
A multicell array formula	296
A single-cell array formula	297
Creating an array constant	298
Array constant elements	299
Understanding the Dimensions of an Array	299
One-dimensional horizontal arrays	300
One-dimensional vertical arrays	300
Two-dimensional arrays	301
Naming Array Constants	302
Working with Array Formulas	303
Entering an array formula	303
Selecting an array formula range	304

Editing an array formula	304
Expanding or contracting a multicell array formula	305
Using Multicell Array Formulas	306
Creating an array from values in a range	306
Creating an array constant from values in a range	306
Performing operations on an array	307
Using functions with an array	308
Transposing an array	308
Generating an array of consecutive integers	309
Using Single-Cell Array Formulas	311
Counting characters in a range	311
Summing the three smallest values in a range	312
Counting text cells in a range	313
Eliminating intermediate formulas	314
Using an array in lieu of a range reference	315

Chapter 15: Performing Magic with Array Formulas 317

Working with Single-Cell Array Formulas	317
Summing a range that contains errors	318
Counting the number of error values in a range	318
Summing based on a condition	319
Summing the <i>n</i> largest values in a range	320
Computing an average that excludes zeros	321
Determining whether a particular value appears in a range	322
Counting the number of differences in two ranges	323
Returning the location of the maximum value in a range	323
Finding the row of a value's <i>n</i> th occurrence in a range	324
Returning the longest text in a range	324
Determining whether a range contains valid values	324
Summing the digits of an integer	325
Summing rounded values	326
Summing every <i>n</i> th value in a range	327
Removing non-numeric characters from a string	329
Determining the closest value in a range	329
Returning the last value in a column	330
Returning the last value in a row	331
Ranking data with an array formula	331
Working with Multicell Array Formulas	332
Returning only positive values from a range	332
Returning nonblank cells from a range	333
Returning a list of unique items in a range	334
Displaying a calendar in a range	334

Part III: Creating Charts and Graphics**337****Chapter 16: Getting Started Making Charts 339**

What Is a Chart?	339
How Excel Handles Charts	340
Embedded charts	341
Chart sheets	342
Parts of a Chart	342
Creating Charts	344
Creating a chart with one keystroke	344
Creating a chart with a mouse click	345
Using the Chart Wizard	346
Hands On: Creating a Chart with the Chart Wizard	348
Selecting the data	348
Chart Wizard—Step 1 of 4	349
Chart Wizard—Step 2 of 4	350
Chart Wizard—Step 3 of 4	353
Chart Wizard—Step 4 of 4	354
Basic Chart Modifications	355
Moving and resizing a chart	356
Changing the chart type	356
Copying a chart	356
Deleting a chart	357
Moving and deleting chart elements	357
Other modifications	357
Printing Charts	357
Understanding Chart Types	359
Choosing a chart type	359
Standard chart types	361
Column charts	361
Bar charts	363
Line charts	363
Pie charts	364
XY (scatter) charts	366
Area charts	366
Doughnut charts	367
Radar charts	368
Surface charts	369
Bubble charts	369
Stock charts	370
Cylinder, cone, and pyramid charts	371

Chapter 17: Learning Advanced Charting 373

Understanding Chart Customization	373
Changing Basic Chart Elements	374
Selecting chart elements	374
Modifying properties by using the Format dialog box	376
Modifying the Chart Area	377
Modifying the Plot Area	377
Working with chart titles	378
Working with the legend	379
Changing the chart gridlines	381
Modifying the axes	382
Working with Data Series	385
Deleting a data series	386
Adding a new data series to a chart	386
Changing data used by a series	387
Displaying data labels in a chart	389
Handling missing data	390
Controlling a data series by hiding data	390
Adding error bars	391
Adding a trend line	392
Modifying 3-D charts	392
Formatting a surface chart	393
Creating combination charts	394
Using secondary axes	395
Displaying a data table	395
Creating Custom Chart Types	396
About custom chart types	396
Creating your own custom chart types	396
Learning Some Chart-Making Tricks	398
Creating picture charts	398
Creating a thermometer chart	399
Creating a gauge chart	400
Creating a comparative histogram	401
Creating a Gantt chart	402
Creating a chart that updates automatically	403
Plotting mathematical functions with one variable	404
Plotting mathematical functions with two variables	405
Frequently Asked Questions	406
Questions about chart settings	406
Chart formatting questions	408
Chart series questions	412
Chart type questions	414
Miscellaneous chart questions	415

Chapter 18: Enhancing Your Work with Pictures and Drawings . . . 419

Using AutoShapes	419
The AutoShapes toolbar	419
Inserting AutoShapes	420

Adding text to an AutoShape	422
Formatting AutoShape objects	423
Selecting multiple objects	423
Moving objects	423
Copying objects	424
Rotating AutoShapes	424
Modifying AutoShapes	424
Changing the stack order of objects	424
Grouping objects	424
Using the Drawing Toolbar	425
Aligning objects	425
Spacing objects evenly	426
Changing an AutoShape to a different AutoShape	426
Adding shadows and 3-D effects	426
Changing the AutoShape defaults	427
Printing objects	427
Working with Other Graphic Types	428
About graphics files	428
Using the Microsoft Clip Organizer	428
Inserting graphics files	430
Copying graphics by using the Clipboard	430
Importing from a digital camera or scanner	430
Displaying a worksheet background image	431
Modifying pictures	431
Using the Office Applets	432
Creating diagrams and org charts	432
Creating WordArt	434

Part IV: Analyzing Data with Excel

435

Chapter 19: Working with Lists 437

What Is a List?	437
What Can You Do with a List?	438
Designing a List	439
Entering Data into a List	439
Entering data with the Data Form dialog box	441
Other uses for the Data Form dialog box	441
Filtering a List	442
Using autofiltering	442
Using advanced filtering	446
Using Database Functions with Lists	452
Sorting a List	454
Simple sorting	454
More-complex sorting	455
Using a custom sort order	456
Sorting nonlists	457
Creating Subtotals	457

Working with a Designated List	460
Creating a designated list	460
Adding rows or columns to a designated list	461
Adding summary formulas to a designated list	462
Advantage in using a designated list	462
Chapter 20: Using External Database Files	463
Understanding External Database Files	463
Retrieving Data with Query: An Example	465
The database file	465
The task	466
Using Query to get the data	466
Working with Data Returned by Query	472
Adjusting the external data range properties	472
Refreshing a query	473
Deleting a query	474
Changing your query	474
Using Query without the Wizard	474
Creating a query manually	475
Using multiple database tables	476
Adding and editing records in external database tables	477
Formatting data	477
Learning more about Query	477
Chapter 21: Analyzing Data with Pivot Tables	479
About Pivot Tables	479
A pivot table example	480
Data appropriate for a pivot table	482
Creating a Pivot Table	484
Step1: Specifying the data location	484
Step 2: Specifying the data	485
Step 3: Completing the pivot table	486
Grouping Pivot Table Items	492
Creating a Calculated Field or Calculated Item	495
Creating a calculated field in a pivot table	496
Inserting a calculated item into a pivot table	497
Chapter 22: Performing Spreadsheet What-If Analysis	501
A What-If Example	501
Types of What-If Analyses	503
Manual What-If Analysis	503
Creating Data Tables	503
Creating a one-input data table	504
Creating a two-input data table	506

Using Scenario Manager	509
Defining scenarios	509
Displaying scenarios	512
Modifying scenarios	513
Merging scenarios	513
Generating a scenario report	513
Chapter 23: Analyzing Data Using Goal Seek and Solver	515
What-If Analysis — in Reverse	515
Single-Cell Goal Seeking	516
A goal-seeking example	516
More about goal seeking	517
Introducing Solver	518
Appropriate problems for Solver	518
A simple Solver example	519
More about Solver	523
Solver Examples	524
Minimizing shipping costs	524
Allocating resources	527
Optimizing an investment portfolio	528
Chapter 24: Analyzing Data with the Analysis ToolPak	531
The Analysis ToolPak: An Overview	531
Using the Analysis ToolPak	532
Installing the Analysis ToolPak add-in	532
Using the Analysis tools	533
Using the Analysis ToolPak functions	533
The Analysis ToolPak Tools	534
The Analysis of Variance tool	534
The Correlation tool	535
The Covariance tool	536
The Descriptive Statistics tool	536
The Exponential Smoothing tool	536
The F-Test (Two-Sample Test for Variance) tool	537
The Fourier Analysis tool	537
The Histogram tool	537
The Moving Average tool	538
The Random Number Generation tool	538
The Rank and Percentile tool	540
The Regression tool	540
The Sampling tool	541
The t-Test tool	542
The z-Test (Two-Sample Test for Means) tool	542

Part V: Using Advanced Excel Features**543****Chapter 25: Using Custom Number Formats 545**

About Number Formatting	545
Automatic number formatting	545
Formatting numbers by using toolbar buttons	546
Using shortcut keys to format numbers	547
Using the format cells dialog box to format numbers	547
Creating a Custom Number Format	548
About custom number formats	549
Parts of a number format string	550
Custom number format codes	551
Custom Number Format Examples	553
Scaling values	553
Displaying leading zeros	557
Displaying fractions	557
Displaying a negative sign on the right	558
Formatting dates and times	559
Displaying text with numbers	559
Suppressing certain types of entries	560
Filling a cell with a repeating character	561

Chapter 26: Customizing Toolbars and Menus 563

Customizing Toolbars	563
Types of customizations	564
Shortcut menus	565
Moving Toolbars	565
Using the Customize Dialog Box	565
The Toolbars tab	565
The Commands tab	568
The Options tab	568
Adding or Removing Toolbar Buttons	569
Moving and copying buttons	570
Inserting a new button	570
Other Toolbar Button Operations	570
Changing a Toolbar Button's Image	572
Using a built-in image	572
Editing a button image	572
Copying another button image	573

Chapter 27: Using Conditional Formatting and Data Validation . . . 575

Conditional Formatting	575
Specifying conditional formatting	576
Formatting types you can apply	576
Specifying conditions	577
Working with conditional formats	579
Conditional formatting formula examples	582

Data Validation	584
Specifying validation criteria	585
Types of validation criteria you can apply	586
Creating a drop-down list	587
Using formulas for data validation rules	589
Using data validation formulas to accept only specific entries	589
Chapter 28: Creating and Using Worksheet Outlines	591
Introducing Worksheet Outlines	591
Creating an Outline	594
Preparing the data	594
Creating an outline automatically	595
Creating an outline manually	596
Working with Outlines	597
Displaying levels	597
Adding data to an outline	597
Removing an outline	597
Hiding the outline symbols	598
Chapter 29: Linking and Consolidating Worksheets	599
Linking Workbooks	599
Why link workbooks?	599
Creating external reference formulas	600
Working with external reference formulas	602
Potential problems with external reference formulas	604
Consolidating Worksheets	605
Consolidating worksheets by using formulas	606
Consolidating worksheets by using Paste Special	607
Consolidating worksheets by using the Consolidate command	608
Chapter 30: Excel and the Internet	613
Understanding How Excel Uses HTML	613
How does it work?	614
Adding some complexity	615
What about interactivity?	616
Saving as an XML spreadsheet	617
Working with Hyperlinks	619
Inserting a hyperlink	619
Using hyperlinks	620
Using Web Queries	620
Chapter 31: Sharing Data with Other Applications	623
Understanding Data Sharing	623
Pasting and Linking Data	624
Using the Clipboards	624
Linking data	626
Copying Excel data to Word	627

Embedding Objects in Documents	628
Embedding an Excel range in a Word document	629
Creating a new Excel object in Word	630
Embedding objects in an Excel worksheet	632
Working with XML Data	632
What is XML?	633
Importing XML data by using a map	634
Importing XML data to a list	636
Exporting XML data from Excel	636

Chapter 32: Using Excel in a Workgroup 639

Using Excel on a Network	639
Understanding File Reservations	640
Sharing Workbooks	641
Understanding shared workbooks	642
Designating a workbook as a shared workbook	642
Controlling the advanced sharing settings	643
Mailing and Routing Workbooks	645
E-mailing a worksheet or workbook	645
Routing a workbook to others	646
Tracking Workbook Changes	647
Turning Track Changes on and off	647
Reviewing the changes	649

Chapter 33: Making Your Worksheets Error-Free 651

Finding and Correcting Formula Errors	651
Mismatched parentheses	652
Cells are filled with hash marks	653
Blank cells are not blank	654
Formulas returning an error	654
Absolute/relative reference problems	658
Operator precedence problems	659
Formulas are not calculated	659
Actual versus displayed values	660
Floating point number errors	660
“Phantom link” errors	662
Using Excel’s Auditing Tools	662
Identifying cells of a particular type	662
Viewing formulas	663
Comparing two windows	664
Tracing cell relationships	665
Tracing error values	667
Fixing circular reference errors	667
Using background error-checking feature	667
Using Excel Formula Evaluator	669
Searching and Replacing	670
Searching for information	670
Replacing information	671
Searching for formatting	671

Spell Checking Your Worksheets	672
Using AutoCorrect	673
Using AutoComplete	675

Part VI: Programming Excel with VBA

677

Chapter 34: Introducing Visual Basic for Applications 679

Introducing VBA Macros	679
Two Types of VBA Macros	680
VBA Sub procedures	680
VBA functions	681
Creating VBA Macros	683
Recording VBA macros	683
More about recording VBA macros	689
Writing VBA code	691
Learning More	702
Read the rest of the book	702
Record your actions	702
Use the online Help system	702
Get another book	702

Chapter 35: Creating Custom Worksheet Functions 703

Overview of VBA Functions	703
An Introductory Example	704
A custom function	704
Using the function in a worksheet	704
Analyzing the custom function	705
About Function Procedures	705
Executing Function Procedures	706
Calling custom functions from a procedure	707
Using custom functions in a worksheet formula	707
Function Procedure Arguments	708
A function with no argument	708
A function with one argument	709
A function with two arguments	710
A function with a range argument	711
Debugging Custom Functions	712
Inserting Custom Functions	712
Learning More	714

Chapter 36: Creating UserForms 715

Why Create UserForms?	715
UserForm Alternatives	716
The InputBox function	716
The MsgBox function	717

Creating UserForms: An Overview	720
Working with UserForms	720
Adding controls	720
Changing the properties of a control	722
Handling events	723
Displaying a UserForm	723
A UserForm Example	723
Creating the UserForm	724
Testing the UserForm	725
Creating an event handler procedure	725
Another UserForm Example	726
Creating the UserForm	727
Testing the UserForm	728
Creating event handler procedures	729
Testing the UserForm	730
Making the macro available from a toolbar button	731
More on Creating UserForms	731
Adding accelerator keys	732
Controlling tab order	732
Learning More	732
Chapter 37: Using UserForm Controls in a Worksheet	733
Why Use Controls on a Worksheet?	733
Using Controls	735
Adding a control	735
About design mode	736
Adjusting properties	736
Common properties	737
Linking controls to cells	738
Creating macros for controls	738
The Controls Toolbox Controls	739
CheckBox control	739
ComboBox control	740
CommandButton control	740
Image control	741
Label control	741
ListBox controls	741
OptionButton controls	741
ScrollBar control	742
SpinButton control	743
TextBox controls	743
ToggleButton control	744
Chapter 38: Working with Excel Events	745
Understanding Events	745
Entering event handler VBA code	746

Using Workbook-Level Events	747
Using the Open event	749
Using the SheetActivate event	750
Using the NewSheet event	750
Using the BeforeSave event	750
Using the BeforeClose event	751
Working with Worksheet Events	751
Using the Change event	752
Monitoring a specific range for changes	752
Using the SelectionChange event	753
Using the BeforeRightClick event	754
Using Non-Object Events	754
Using the OnTime event	755
Using the OnKey event	755
Chapter 39: VBA Examples	757
Working with Ranges	757
Copying a range	758
Copying a variable-size range	759
Selecting to the end of a row or column	759
Selecting a row or column	760
Moving a range	760
Looping through a range efficiently	761
Prompting for a cell value	762
Determining the type of selection	763
Identifying a multiple selection	764
Changing Excel's Settings	764
Changing Boolean settings	765
Changing non-Boolean settings	765
Working with Charts	766
Modifying the chart type	766
Modifying chart properties	767
Applying chart formatting	767
VBA Speed Tips	768
Turning off screen updating	768
Preventing alert messages	768
Simplifying object references	769
Declaring variable types	769
Chapter 40: Creating Custom Excel Add-Ins	773
What Is an Add-In?	773
Working with Add-Ins	774
Why Create Add-Ins?	775
Creating Add-Ins	776
An Add-In Example	777
Setting up the workbook	777
Module1	778

ThisWorkbook 778
UserForm1 779
Testing the workbook 780
Adding descriptive information 781
Protecting the project 782
Creating the add-in 782
Opening the add-in 783

Part VII: Appendixes 785

Appendix A: Worksheet Function Reference 787
Appendix B: What’s on the CD-ROM 803
Appendix C: Just for Fun 815
Appendix D: Additional Excel Resources 837
Appendix E: Excel Shortcut Keys 845

Index 853
End-User License Agreement 899