

Contents

Introduction	1
What's in the Book	1
This Book's Special Features	2
<hr/>	
I MASTERING EXCEL RANGES AND FORMULAS	
1 Getting the Most Out of Ranges	7
A Review of Excel's Range-Selection Techniques	7
Selecting a Range with the Mouse	8
Selecting Cell Ranges with the Keyboard	10
Working with 3D Ranges	12
Advanced Range-Selection Techniques	13
Selecting a Range Using Go To	13
Using the Go To Special Dialog Box	14
Data Entry in a Range	17
Filling a Range	18
Using the Fill Handle	18
Using AutoFill to Create Text and Numeric Series	18
Creating a Custom AutoFill List	20
Filling a Range	21
Creating a Series	21
Copying a Range	22
Using Drag-and-Drop to Copy a Range	23
Copying a Range with the Copy Command	23
Making Multiple Copies of a Range	24
Inserting a Copy of a Range	25
Advanced Range Copying	25
Moving a Range	28
Using Drag-and-Drop to Move a Range	28
Using the Menu Commands to Move a Range	28
Inserting and Deleting a Range	29
Inserting an Entire Row or Column	29
Inserting a Row or Column with the Fill Handle	30
Inserting a Cell or Range	31
Inserting a Range with the Fill Handle	32
Deleting an Entire Row or Column	32
Deleting a Cell or Range	32
Clearing a Range	33
Clearing a Range with the Fill Handle	33

Using Excel's Reference Operators	33
Using the Range Operator	33
Using the Intersection Operator	34
Using the Union Operator	34
From Here	35
2 Using Range Names	37
Defining a Range Name	38
Working with the Name Box	38
Using the Define Name Dialog Box	39
Defining Sheet-Level Range Names	41
Assigning a Name to a 3D Range	41
Using Worksheet Text to Define Names	42
Naming Constants	44
Working with Range Names	45
Referring to a Range Name	46
Navigating Using Range Names	47
Pasting a List of Range Names in a Worksheet	47
Editing a Range Name's Coordinates	47
Adjusting Range Name Coordinates Automatically	48
Changing a Range Name	49
Deleting a Range Name	50
Range Names and the Reference Operators	50
Using Names with the Range Operator	50
Using Names with the Intersection Operator	51
From Here	51
3 Building Basic Formulas	53
Understanding Formula Basics	53
Entering and Editing Formulas	54
Using Arithmetic Formulas	55
Using Comparison Formulas	55
Using Text Formulas	56
Using Reference Formulas	56
Understanding Operator Precedence	57
The Order of Precedence	57
Controlling the Order of Precedence	58
Controlling Worksheet Calculation	59
Copying and Moving Formulas	61
Understanding Relative Reference Format	62
Understanding Absolute Reference Format	63
Copying a Formula Without Adjusting Relative References	64
Displaying Worksheet Formulas	64
Converting a Formula to a Value	65

Working with Range Names in Formulas	66
Pasting a Name into a Formula	66
Applying Names to Formulas	66
Naming Formulas	69
Working with Links in Formulas	70
Understanding External References	71
Updating Links	71
Editing Links	72
Formatting Numbers, Dates, and Times	72
Numeric Display Formats	73
Date and Time Display Formats	80
Deleting Custom Formats	82
From Here	83
4 Creating Advanced Formulas	85
Working with Arrays	85
Using Array Formulas	86
Using Array Constants	88
Functions That Use or Return Arrays	89
Using Iteration and Circular References	90
Consolidating Multisheet Data	92
Consolidating by Position	93
Consolidating by Category	96
Applying Data-Validation Rules to Cells	98
Using Dialog Box Controls on a Worksheet	100
Using the Forms Toolbar	100
Adding a Control to a Worksheet	100
Linking a Control to a Cell Value	101
Understanding the Worksheet Controls	101
From Here	106
5 Troubleshooting Formulas	107
Understanding Excel's Error Values	108
#DIV/0!	108
#N/A	109
#NAME?	109
Case Study	110
Avoiding #NAME? Errors When Deleting Range Names	110
#NULL!	110
#NUM!	111
#REF!	111
#VALUE!	111

Fixing Other Formula Errors	112
Missing or Mismatched Parentheses	112
Erroneous Formula Results	113
Fixing Circular References	113
Using the Formula Error Checker	114
Choosing an Error Action	115
Setting Error Checker Options	115
Auditing a Worksheet	117
Understanding Auditing	118
Tracing Cell Precedents	119
Tracing Cell Dependents	119
Tracing Cell Errors	120
Removing Tracer Arrows	120
Evaluating Formulas	120
Watching Cell Values	121
From Here	122

II HARNESSING THE POWER OF FUNCTIONS

6 Using Functions	125
About Excel's Functions	126
The Structure of a Function	126
Typing a Function into a Formula	128
Using the Insert Function Feature	129
Loading the Analysis ToolPak Functions	131
From Here	132
7 Working with Text Functions	133
Working with Characters and Codes	135
The CHAR() Function	135
The CODE() Function	138
Converting Text	138
The LOWER() Function	139
The UPPER() Function	139
The PROPER() Function	139
Formatting Text	139
Manipulating Text	142
Removing Unwanted Characters from a String	142
The REPT() Function: Repeating a Character	143
Extracting a Substring	145
Case Study	147
Generating Account Numbers	147
Searching for Substrings	148
Substituting One Substring for Another	151

Case Study	153
Generating Account Numbers, Part 2	153
From Here	154
8 Working with Logical and Information Functions	155
Adding Intelligence with Logical Functions	155
Using the IF() Function	156
Performing Multiple Logical Tests	159
Combining Logical Functions with Arrays	162
Case Study	168
Building an Accounts Receivable Aging Worksheet	168
Getting Data with Information Functions	171
The CELL() Function	172
The ERROR.TYPE() Function	174
The INFO() Function	176
The IS Functions	176
From Here	179
9 Working with Lookup Functions	181
Understanding Lookup Tables	182
The CHOOSE() Function	183
Determining the Name of the Day of the Week	183
Determining the Month of the Fiscal Year	184
Calculating Weighted Questionnaire Results	185
Integrating CHOOSE() and Worksheet Option Buttons	185
Looking Up Values in Tables	186
The VLOOKUP() Function	186
The HLOOKUP() Function	187
Performing Range Lookups	188
Finding Exact Matches	190
Advanced Lookup Operations	191
From Here	197
10 Working with Date and Time Functions	199
How Excel Deals with Dates and Times	199
Entering Dates and Times	200
Excel and Two-Digit Years	201
Using Excel's Date Functions	202
Returning a Date	204
Returning Parts of a Date	205
Calculating the Difference Between Two Dates	215
Using Excel's Time Functions	219
Returning a Time	220
Returning Parts of a Time	221
Calculating the Difference Between Two Times	223

Case Study	224
Building an Employee Time Sheet	224
From Here	227
11 Working with Math Functions	229
Understanding Excel's Rounding Functions	233
The ROUND() Function	233
The MROUND() Function	234
The ROUNDDOWN() and ROUNDUP() Functions	234
The CEILING() and FLOOR() Functions	235
Determining the Fiscal Quarter in Which a Date Falls	235
Calculating Easter Dates	236
The EVEN() and ODD() Functions	236
The INT() and TRUNC() Functions	237
Using Rounding to Prevent Calculation Errors	237
Setting Price Points	238
Case Study	238
Rounding Billable Time	238
Summing Values	239
The SUM() Function	239
Calculating Cumulative Totals	239
Summing Only the Positive or Negative Values in a Range	240
The MOD() Function	241
A Better Formula for Time Differences	241
Summing Every nth Row	242
Determining Whether a Year Is a Leap Year	242
Creating Ledger Shading	243
Generating Random Numbers	244
The RAND() Function	244
The RANDBETWEEN() Function	246
From Here	247
12 Working with Statistical Functions	249
Understanding Descriptive Statistics	251
Counting Items with the COUNT() Function	252
Calculating Averages	253
The AVERAGE() Function	253
The MEDIAN() Function	253
The MODE() Function	254
Calculating the Weighted Mean	254
Calculating Extreme Values	255
The MAX() and MIN() Functions	255
The LARGE() and SMALL() Functions	256
Performing Calculations on the Top k Values	257
Performing Calculations on the Bottom k Values	257

Calculating Measures of Variation	258
Calculating the Range	258
Calculating the Variance with the VAR() Function	258
Calculating the Standard Deviation with the STDEVP() and STDEV() Functions	259
Working with Frequency Distributions	261
The FREQUENCY() Function	261
Understanding the Normal Distribution and the NORMDIST() Function	262
The Shape of the Curve I: The SKEW() Function	264
The Shape of the Curve II: The KURT() Function	265
Using the Analysis ToolPak Statistical Tools	266
Using the Descriptive Statistics Tool	269
Determining the Correlation Between Data	271
Working with Histograms	273
Using the Random Number Generation Tool	275
Working with Rank and Percentile	277
From Here	279

III BUILDING BUSINESS MODELS

13 Analyzing Data with Lists	283
Converting a Range to a List	284
Basic List Operations	285
Sorting a List	287
Sorting on More Than Three Keys	288
Sorting a List in Natural Order	289
Sorting on Part of a Field	290
Sorting Without Articles	290
Filtering List Data	292
Using AutoFilter to Filter a List	292
Using Complex Criteria to Filter a List	296
Entering Computed Criteria	299
Copying Filtered Data to a Different Range	300
Summarizing List Data	301
Creating Automatic Subtotals	301
Setting Up a List for Automatic Subtotals	302
Displaying Subtotals	302
Adding More Subtotals	303
Nesting Subtotals	304
Working with a Subtotal's Outline Symbols	305
Removing Subtotals	306

Excel's List Functions	306
About List Functions	307
List Functions That Don't Require a Criteria Range.....	307
List Functions That Require a Criteria Range	309
Case Study	312
Applying Statistical List Functions to a Defects Database	312
From Here	313
14 Using Excel's Business-Modeling Tools	315
Using What-If Analysis	315
Setting Up a One-Input Data Table	316
Adding More Formulas to the Input Table.....	318
Setting Up a Two-Input Table	319
Editing a Data Table	320
Working with Goal Seek	321
How Does Goal Seek Work?	321
Running Goal Seek	321
Optimizing Product Margin	323
A Note About Goal Seek's Approximations	324
Performing a Break-Even Analysis	326
Solving Algebraic Equations	326
Goal Seeking with Charts	327
Working with Scenarios	330
Understanding Scenarios	330
Setting Up Your Worksheet for Scenarios.....	331
Adding a Scenario	331
Displaying a Scenario	333
Editing a Scenario	333
Merging Scenarios	334
Generating a Summary Report	334
Deleting a Scenario	336
From Here	336
15 Using Regression to Track Trends and Make Forecasts	339
Choosing a Regression Method	340
Using Simple Regression on Linear Data	340
Analyzing Trends Using Best-Fit Lines	341
Making Forecasts	348
Case Study	353
Trend Analysis and Forecasting for a Seasonal Sales Model	353
Using Simple Regression on Nonlinear Data	360
Working with an Exponential Trend	361
Working with a Logarithmic Trend	365

Working with a Power Trend	367
Using Polynomial Regression Analysis	371
Using Multiple Regression Analysis	374
From Here	376
16 Solving Complex Problems with Solver	377
Some Background on Solver	377
The Advantages of Solver	378
When Do You Use Solver?	378
Loading Solver	379
Using Solver	379
Adding Constraints	382
Saving a Solution as a Scenario	384
Setting Other Solver Options	384
Controlling Solver	385
Selecting the Method Solver Uses	386
Working with Solver Models	387
Making Sense of Solver's Messages	388
Case Study	389
Solving the Transportation Problem	389
Displaying Solver's Reports	391
The Answer Report	391
The Sensitivity Report	392
The Limits Report	394
From Here	395
IV BUILDING FINANCIAL FORMULAS	
17 Building Loan Formulas	399
Understanding the Time Value of Money	399
Calculating the Loan Payment	400
Loan Payment Analysis	401
Working with a Balloon Loan	402
Calculating Interest Costs	403
Calculating the Principal and Interest	403
Calculating Interest Costs, Part 2	404
Calculating Cumulative Principal and Interest	405
Building a Loan Amortization Schedule	406
Building a Fixed-Rate Amortization Schedule	406
Building a Dynamic Amortization Schedule	407
Calculating the Term of the Loan	409
Calculating the Interest Rate Required for a Loan	411

Calculating How Much You Can Borrow	412
Case Study	413
Working with Mortgages	413
Building a Variable-Rate Mortgage Amortization Schedule	413
Allowing for Mortgage Principal Paydowns	415
From Here	416
18 Building Investment Formulas	417
Working with Interest Rates	417
Understanding Compound Interest	418
Nominal Versus Effective Interest	418
Converting Between the Nominal Rate and the Effective Rate	419
Calculating the Future Value	420
The Future Value of a Lump Sum	420
The Future Value of a Series of Deposits	421
The Future Value of a Lump Sum Plus Deposits	422
Working Toward an Investment Goal	422
Calculating the Required Interest Rate	422
Calculating the Required Number of Periods	423
Calculating the Required Regular Deposit	424
Calculating the Required Initial Deposit	425
Calculating the Future Value with Varying Interest Rates	425
Case Study	426
Building an Investment Schedule	426
From Here	429
19 Working with Bonds	431
Glossary of Bond Terms	431
Calculating Bond Yields	432
The <code>YIELD()</code> Function	432
The <code>ODDFYIELD()</code> and <code>ODDLYIELD()</code> Functions	433
Calculating Bond Prices	435
The <code>PRICE()</code> Function	435
The <code>ODDFPRICE()</code> and <code>ODDLPRICE()</code> Functions	436
Calculating Bond Duration	437
Calculating Bond Principal at Maturity	438
Working with Coupons	439
Calculating the Coupon Payment	439
Working with Coupon Dates	440
Calculating the Accrued Bond Interest	441
Calculating the Remaining Bond Interest	442
Working with Zero-Coupon Bonds	443

Working with Treasury Bills	444
Calculating the T-Bill Yield	444
Calculating the T-Bill Price	445
From Here	445
20 Building Discount Formulas	447
Calculating the Present Value	448
Taking Inflation into Account	448
Calculating Present Value Using <code>PV()</code>	449
Income Investing Versus Purchasing a Rental Property	450
Buying Versus Leasing	451
Discounting Cash Flows	452
Calculating the Net Present Value	453
Calculating Net Present Value Using <code>NPV()</code>	454
Net Present Value with Varying Cash Flows	455
Net Present Value with Nonperiodic Cash Flows	456
Calculating the Payback Period	457
Simple Undiscounted Payback Period	457
Exact Undiscounted Payback Point	458
Discounted Payback Period	459
Calculating the Internal Rate of Return	460
Using the <code>IRR()</code> Function	460
Calculating the Internal Rate of Return for Nonperiodic Cash Flows	461
Calculating Multiple Internal Rates of Return	461
Case Study	463
Publishing a Book	463
From Here	466
Index	467