



Brief Table of Contents	ix
Preface	xxi
Before You Begin	xxxiii
1 Advanced Painter Application	1
<i>Introducing Computers, the Internet and Visual Basic</i>	
1.1 What Is a Computer?	1
1.2 Computer Organization	2
1.3 Machine Languages, Assembly Languages and High-Level Languages	3
1.4 Visual Basic	4
1.5 Other High-Level Languages	5
1.6 Structured Programming	6
1.7 Key Software Trend: Object Technology	7
1.8 The Internet and the World Wide Web	8
1.9 Introduction to Microsoft .NET	9
1.10 Test-Driving the Visual Basic Advanced Painter Application	10
1.11 Web Resources	12
1.12 Wrap-Up	13
2 Welcome Application	18
<i>Introducing the Visual Basic 2008 Express Edition IDE</i>	
2.1 Test-Driving the Welcome Application	18
2.2 Overview of the Visual Basic 2008 Express Edition IDE	19
2.3 Creating a Project for the Welcome Application	21
2.4 Menu Bar and Toolbar	26
2.5 Visual Basic 2008 Express Edition IDE Windows	27
2.6 Auto-Hide	31
2.7 Using Help	33
2.8 Saving and Closing Projects in Visual Basic	34
2.9 Web Resources	34
2.10 Wrap-Up	34
3 Welcome Application	40
<i>Introduction to Visual Programming</i>	
3.1 Test-Driving the Welcome Application	40
3.2 Constructing the Welcome Application	42
3.3 Objects Used in the Welcome Application	53
3.4 Wrap-Up	54

4	Designing the Inventory Application	64
	<i>Introducing TextBoxes and Buttons</i>	
4.1	Test-Driving the Inventory Application	64
4.2	Constructing the Inventory Application	66
4.3	Adding Labels to the Inventory Application	70
4.4	Adding TextBoxes and a Button to the Form	73
4.5	Wrap-Up	76
5	Completing the Inventory Application	83
	<i>Introducing Programming</i>	
5.1	Test-Driving the Inventory Application	83
5.2	Introduction to Visual Basic Code	84
5.3	Inserting an Event Handler	87
5.4	Performing a Calculation and Displaying the Result	91
5.5	Using the IDE to Eliminate Compilation Errors	94
5.6	Wrap-Up	98
6	Enhancing the Inventory Application	105
	<i>Introducing Variables, Memory Concepts and Arithmetic</i>	
6.1	Test-Driving the Enhanced Inventory Application	105
6.2	Variables	106
6.3	Handling the TextChanged Event	109
6.4	Memory Concepts	111
6.5	Arithmetic	112
6.6	Using the Debugger: Breakpoints	115
6.7	Wrap-Up	118
7	Wage Calculator Application	126
	<i>Introducing Algorithms, Pseudocode and Program Control</i>	
7.1	Test-Driving the Wage Calculator Application	126
7.2	Algorithms	127
7.3	Pseudocode	128
7.4	Control Structures	129
7.5	If...Then Selection Statement	131
7.6	If...Then...Else Selection Statement and Conditional If Expressions	134
7.7	Constructing the Wage Calculator Application	136
7.8	Assignment Operators	141
7.9	Formatting Text	142
7.10	Using the Debugger: The Watch Window	144
7.11	Wrap-Up	148
8	Dental Payment Application	156
	<i>Introducing CheckBoxes and Message Dialogs</i>	
8.1	Test-Driving the Dental Payment Application	156
8.2	Designing the Dental Payment Application	159
8.3	Using CheckBoxes	160
8.4	Using a Dialog to Display a Message	162
8.5	Logical Operators	166
8.6	Designer-Generated Code	170
8.7	Wrap-Up	172
9	Car Payment Calculator Application	180
	<i>Introducing the Do While...Loop and Do Until...Loop Repetition Statements</i>	
9.1	Test-Driving the Car Payment Calculator Application	180

9.2	Do While...Loop Repetition Statement	182
9.3	Do Until...Loop Repetition Statement	184
9.4	Constructing the Car Payment Calculator Application	186
9.5	Wrap-Up	193
10	Class Average Application	201
	<i>Introducing the Do...Loop While and Do...Loop Until Repetition Statements</i>	
10.1	Test-Driving the Class Average Application	201
10.2	Do...Loop While Repetition Statement	203
10.3	Do...Loop Until Repetition Statement	205
10.4	Creating the Class Average Application	207
10.5	Wrap-Up	213
11	Interest Calculator Application	221
	<i>Introducing the For...Next Repetition Statement and the NumericUpDown Control</i>	
11.1	Test-Driving the Interest Calculator Application	221
11.2	Essentials of Counter-Controlled Repetition	223
11.3	Introducing the For...Next Repetition Statement	224
11.4	Examples Using the For...Next Statement	228
11.5	Constructing the Interest Calculator Application	228
11.6	Wrap-Up	235
12	Security Panel Application	243
	<i>Introducing the Select Case Multiple-Selection Statement</i>	
12.1	Test-Driving the Security Panel Application	243
12.2	Introducing the Select Case Multiple-Selection Statement	245
12.3	Constructing the Security Panel Application	247
12.4	Wrap-Up	255
13	Enhancing the Wage Calculator Application	263
	<i>Introducing Function Procedures and Sub Procedures</i>	
13.1	Test-Driving the Enhanced Wage Calculator Application	263
13.2	Classes and Procedures	264
13.3	Function Procedures	265
13.4	Using Sub Procedures in the Wage Calculator Application	273
13.5	Using the Debugger: Debugging Controls	277
13.6	Optional Parameters	280
13.7	Wrap-Up	281
14	Shipping Time Application	289
	<i>Using Dates and Timers</i>	
14.1	Test-Driving the Shipping Time Application	289
14.2	Date Variables	290
14.3	Creating the Shipping Time Application: Design Elements	293
14.4	Creating the Shipping Time Application: Inserting Code	298
14.5	Wrap-Up	305
15	Fund Raiser Application	313
	<i>Introducing Scope, Pass-by-Reference and Option Strict</i>	
15.1	Test-Driving the Fund Raiser Application	313
15.2	Constructing the Fund Raiser Application	315
15.3	Passing Arguments: Pass-by-Value vs. Pass-by-Reference	320

15.4	Option Strict	323
15.5	Wrap-Up	330
16	Craps Game Application	337
	<i>Introducing Random-Number Generation and Enum</i>	
16.1	Test-Driving the Craps Game Application	337
16.2	Random-Number Generation	339
16.3	Constructing the Craps Game Application	341
16.4	Using Random Numbers in the Craps Game Application	344
16.5	Wrap-Up	351
17	Flag Quiz Application	357
	<i>Introducing One-Dimensional Arrays and ComboBoxes</i>	
17.1	Test-Driving the Flag Quiz Application	357
17.2	Introducing Arrays	359
17.3	Declaring and Allocating Arrays	360
17.4	Constructing the Flag Quiz Application	363
17.5	Sorting Arrays	374
17.6	Wrap-Up	376
18	Student Grades Application	384
	<i>Introducing Two-Dimensional Arrays and RadioButtons</i>	
18.1	Test-Driving the Student Grades Application	384
18.2	Two-Dimensional Rectangular Arrays	386
18.3	Using RadioButtons	388
18.4	Inserting Code into the Student Grades Application	390
18.5	Wrap-Up	400
19	Microwave Oven Application	407
	<i>Building Your Own Classes and Objects</i>	
19.1	Test-Driving the Microwave Oven Application	408
19.2	Designing the Microwave Oven Application	410
19.3	Adding a New Class to the Project	414
19.4	Initializing Class Objects: Constructors	416
19.5	Properties	418
19.6	Completing the Microwave Oven Application	421
19.7	Controlling Access to Members	427
19.8	Using the Debugger: The Locals Window	432
19.9	Wrap-Up	435
20	Shipping Hub Application	445
	<i>Introducing Generic Collections, LINQ, For Each...Next and Access Keys</i>	
20.1	Test-Driving the Shipping Hub Application	445
20.2	Package Class	448
20.3	Using Properties TabIndex and TabStop	449
20.4	Using Access Keys	450
20.5	Collections	451
20.6	Shipping Hub Application: Using Class List(Of T)	452
20.7	For Each...Next Repetition Statement	460
20.8	Language-Integrated Query (LINQ)	462
20.9	Wrap-Up	468

21	Typing Application	477
	<i>Introducing Keyboard Events, Menus, Dialogs and the Dictionary Collection</i>	
21.1	Test-Driving the Typing Application	477
21.2	Analyzing the Typing Application	480
21.3	Keyboard Events	481
21.4	IsNot Operator	488
21.5	Menus	489
21.6	Wrap-Up	498
22	Screen Scraping Application	508
	<i>Introducing String Processing</i>	
22.1	Test-Driving the Screen Scraping Application	508
22.2	Fundamentals of Strings	510
22.3	Analyzing the Screen Scraping Application	511
22.4	Locating Substrings in Strings	512
22.5	Extracting Substrings from Strings	515
22.6	Replacing Substrings in Strings	516
22.7	Other String Methods	518
22.8	Wrap-Up	519
23	Ticket Information Application	527
	<i>Introducing Sequential-Access Files</i>	
23.1	Test-Driving the Ticket Information Application	527
23.2	Data Hierarchy	529
23.3	Files and Streams	531
23.4	Writing to a File—Creating the Write Event Application	531
23.5	Building the Ticket Information Application	540
23.6	Using LINQ and Class File to Extract Data from a Text File	548
23.7	Wrap-Up	552
24	Address Book Application	562
	<i>Introducing Database Programming</i>	
24.1	Test-Driving the Address Book Application	563
24.2	Planning the Address Book Application	566
24.3	Creating Database Connections	567
24.4	Programming the Address Book Application	575
24.5	Wrap-Up	581
25	Enhanced Car Payment Calculator Application	589
	<i>Introducing Exception Handling</i>	
25.1	Test-Driving the Enhanced Car Payment Calculator Application	589
25.2	Introduction to Exception Handling	592
25.3	Exception Handling in Visual Basic	593
25.4	Constructing the Enhanced Car Payment Calculator Application	594
25.5	Additional Exception Handling Capabilities	599
25.6	Wrap-Up	600
26	CheckWriter Application	605
	<i>Introducing Graphics and Printing</i>	
26.1	Test-Driving the CheckWriter Application	605
26.2	GDI+ Introduction	607
26.3	Constructing the CheckWriter Application	608
26.4	PrintPreviewDialogs and PrintDocuments	611
26.5	Creating an Event Handler for the CheckWriter Application	611

26.6	Graphics Objects: Colors, Lines and Shapes	614
26.7	Printing Each Control of the CheckWriter Application	616
26.8	Font Class	618
26.9	Previewing and Printing the Check	620
26.10	Wrap-Up	626
27	“Cat and Mouse” Painter Application	634
	<i>Introducing Graphics with Windows Presentation Foundation (WPF) and Mouse Events</i>	
27.1	Test-Driving the Painter Application	634
27.2	Windows Presentation Foundation (WPF)	636
27.3	XAML (Extensible Application Markup Language)	637
27.4	Creating the Painter Application’s GUI in WPF	638
27.5	Constructing the Painter Application	651
27.6	Handling the <code>MouseDown</code> Event	652
27.7	Handling the <code>MouseUp</code> Event	656
27.8	Handling the <code>MouseMove</code> Event	657
27.9	Handling Right Mouse Button Events	659
27.10	Select Colors with <code>RadioButton</code> s	661
27.11	Wrap-Up	665
28	Bookstore Web Application	676
	<i>Introducing Visual Web Developer 2008 Express and the ASP.NET Development Server</i>	
28.1	Multitier Architecture	676
28.2	Web Servers	677
28.3	Visual Web Developer 2008 Express and the ASP.NET Development Server	679
28.4	Test-Driving the Bookstore Web Application	679
28.5	Wrap-Up	683
29	Bookstore Web Application: Client Tier	687
	<i>Introducing Web Controls</i>	
29.1	Analyzing the Bookstore Web Application	687
29.2	Creating ASPX Pages	688
29.3	Designing the <code>Books.aspx</code> Page	691
29.4	Designing the <code>BookInformation.aspx</code> Page	697
29.5	Wrap-Up	700
30	Bookstore Web Application: Information Tier	707
	<i>Examining the Database and Creating Database Components</i>	
30.1	Reviewing the Bookstore Web Application	707
30.2	Information Tier: Database	709
30.3	Connecting to the Database and Retrieving Information	709
30.4	Wrap-Up	715
31	Bookstore Application: Middle Tier	718
	<i>Introducing Code-Behind Files, Session State and ASP.NET Ajax</i>	
31.1	Reviewing the Bookstore Web Application	718
31.2	Programming the <code>Books</code> Page’s Code-Behind File	720
31.3	Coding the <code>BookInformation</code> Page’s Code-Behind File and Data Binding to the <code>DetailsView</code>	724
31.4	ASP.NET Ajax	729
31.5	Internet and Web Resources	734
31.6	Wrap-Up	734

32	Weather Viewer Application	741
	<i>Introducing Microsoft Silverlight, XML, LINQ to XML and Web Services</i>	
32.1	Platform Overview	741
32.2	Silverlight 2 Runtime and Tools Installation	743
32.3	Test-Driving the Weather Viewer Application	743
32.4	Overviewing the Weather Viewer Application	745
32.5	Creating the Weather Viewer Application	746
32.6	Calling a Web Service and Using LINQ to XML to Process the Results	752
32.7	Customizing the Data Presentation	760
32.8	Creating a Customized Silverlight Control	763
32.9	Final Weather Viewer Application Code	767
32.10	Wrap-Up	771
A	Operator Precedence Chart	782
B	ASCII Character Set	783
C	GUI Design Guidelines	784
D	Visual Basic 2008 Express Windows Form Designer Tools	789
D.1	Internet and Web Resources	793
E	Keyword Chart	794
F	Primitive Data Types	796
	Glossary	798
	Index	817