



Table of Contents

About this book.....	xxxv
Introduction.....	xxxix

Part I - .NET Framework 3.5 and Visual Studio 2008

Chapter 1: Getting Started with .NET Framework 3.5	1
Introducing .NET Framework	2
Evolution of .NET Framework	2
Benefits of .NET Framework.....	3
Architecture of .NET Framework 3.5.....	3
Components of .NET Framework 3.5.....	4
Common Language Runtime.....	4
Managed Code.....	4
Unmanaged Code.....	6
Memory Management	6
.NET Framework Class Library	6
Common Language Specification	7
Common Type System.....	7
Classification of Types.....	7
Metadata and Assemblies.....	8
Assembly Contents.....	8
Assembly Manifest	9
Global Assembly Cache.....	9
Strong Name Assemblies	10
Private and Shared Assemblies	10
Side-by-Side Executions	10
Windows Forms.....	10
ASP.NET and ASP.NET AJAX	10
ADO.NET	11
Windows Workflow Foundation	12
Windows Presentation Foundation	13
Windows Communication Foundation.....	13
Windows CardSpace	15
LINQ	16
Summary	16
Chapter 2: Introducing Visual Studio 2008	17
New Features of Visual Studio 2008	18
Support for Multi-Targeting	18
Support for ASP.NET AJAX and JavaScript IntelliSense	19
Support for Language Integrated Query (LINQ)	20
Improved Deployment	20
Support for Client Application Services	20
Support for Reporting Applications	21
Installing Visual Studio 2008.....	21
Editions of Visual Studio	21
System Requirements for Visual Studio 2008	22
Exploring the Visual Studio 2008 IDE	30

Table of Contents

Start Page.....	34
Menu Bar.....	35
Toolbars.....	35
Toolbox.....	35
Code Editor.....	37
IntelliSense.....	38
Designers.....	40
Windows Forms Designer.....	40
WPF Designer.....	40
Web Forms Designer.....	42
Solution Explorer	43
Properties Window.....	44
Object Browser	45
Object Browser Toolbar	46
Class View Window	47
Server Explorer.....	48
Component Tray.....	50
CSS Style Manager.....	51
Output Window.....	52
Task List and Error List	52
Command Window	54
Dynamic Help Window.....	54
Basic IDE Operations.....	55
Creating a New Windows Application.....	55
Saving Code on the Toolbox	57
Docking the Windows.....	58
Switching between the Windows.....	59
Specifying the .NET Framework Version for Projects	61
Exporting and Importing IDE Settings.....	62
Changing the IDE Font and Color	68
Building and Debugging the Projects.....	70
Summary	72

Part II - Visual Basic Programming Language and OOPs

Chapter 3: Introducing Visual Basic 2008.....	73
In Depth.....	74
New Features Introduced in Visual Basic 2008.....	74
Language Improvements in Visual Basic 2008	74
Query Expressions.....	74
Local Type Inference	75
Object Initializers.....	75
Anonymous Types	75
Extension Methods.....	76
Support for XML.....	76
Lambda Expressions	76
Nullable Types	76
Partial Methods	77
Compiler Changes and Options in Visual Basic 2008.....	78
Friend Assemblies	78
The Option Infer Statement.....	78
Keywords	78
Visual Basic Statements.....	80
Statement Syntax.....	81
The Option and Imports Statements.....	82
The Option Statements.....	82
The Imports Statement.....	83
Namespaces	83
System Namespaces	84
Data Types	86

Table of Contents

Variables and Constants	87
Declaring Variable	87
Constant Declaration.....	90
Data Type Conversion.....	91
Operators.....	93
Operator Precedence	95
Arrays	97
Standard Arrays.....	97
Dynamic Arrays.....	98
Enumerations.....	98
Strings	99
Immediate Solutions.....	100
Creating a Console Application.....	100
Using the Option Statement.....	101
Using the Imports Statement	101
Creating Aliases for Namespace Classes	102
Declaring Variables and Constants	102
Converting Data Types	103
Creating Standard Arrays.....	104
Creating Dynamic Arrays.....	105
Creating Enumerations	106
Working with Strings	107
Using the Val and Str Functions.....	108
Commenting Your Code.....	109
Summary	109
Chapter 4: Flow Control and Exception Handling in Visual Basic 2008.....	111
In Depth.....	112
Control Flow Statements	112
Selection Statements	112
The If Statement.....	113
The Select Case Statement.....	113
Iteration Statements.....	114
The While Statement	114
The Do While Statement.....	114
The For Statement.....	115
The For Each Statement	115
The Jump Statements	116
The GoTo Statement.....	116
The Exit Statement.....	116
The Continue Statement	116
The Return Statement	116
The With Statement	117
Sub procedures and Functions	117
Understanding Scope	119
Block Scope	120
Procedure Scope.....	121
Module Scope	121
Namespace Scope	122
Exception Handling.....	122
Structured Exception Handling.....	123
The Try...Catch...Finally Statement.....	124
The Throw Statement.....	124
Unstructured Exception Handling.....	124
The On Error Resume Next Statement.....	125
The On Error Statement.....	125
Immediate Solutions.....	127
Using the If Else Statement.....	127

Table of Contents

Using the Select Case Statement.....	127
Using the While Statement	128
Using the Do While Statement.....	130
Using the For Statement.....	131
Using the For Each Statement.....	132
Using the With Statement.....	133
Jumping to the Labeled Statement.....	134
Breaking Out of a Loop	135
Using the Continue Statement.....	137
Creating Sub procedures	137
Passing Variable Number of Arguments to a Procedure	138
Specifying Optional Procedure Arguments	139
Creating Functions.....	140
Using the On Error Resume Next Statement.....	140
Using the On Error Statement.....	141
Capturing an Exception	142
Throwing an Exception.....	142
Summary	143
Chapter 5: Object-Oriented Programming in Visual Basic 2008.....	145
In Depth.....	146
Classes and Objects	146
Constructors and Destructors.....	146
Shared Members	147
Access Modifiers	147
Structures and Modules	148
Encapsulation	149
Inheritance.....	149
Inheritance Modifiers.....	150
Extension Methods.....	151
Polymorphism	151
Compile Time Polymorphism/Overloading	151
Method Overloading	152
Operator Overloading	152
Runtime Polymorphism/OVERRIDING	153
Shadowing.....	153
Abstraction.....	154
Abstract Classes and Abstract Methods	155
Interface	156
Syntax of Interfaces	156
Implementation of Interfaces.....	156
Interface and Inheritance.....	157
Immediate Solutions.....	159
Creating a Class.....	159
Creating a Constructor.....	159
Creating an Object	160
Creating Shared Members.....	161
Using the Is and IsNot Operators to Compare Two Objects	163
Creating Destructors	164
Using the Finalize Method	164
Using the Dispose Method.....	165
Creating Structures.....	166
Implementing Inheritance	167
Creating an Extension Method	168
Implementing Early Binding/Overloading	169
Implementing Late Binding/OVERRIDING	170
Implementing Shadowing	171
Using the MyBase Keyword	172
Using the MyClass Keyword	173

Table of Contents

Creating Abstract Classes and Abstract Methods	174
Using the NotInheritable and NotOverridable Keywords	175
Creating and Implementing Interfaces	176
Summary	178

Part III - Windows Forms and WPF

Chapter 6: Windows Forms in Visual Basic 2008 179

In Depth..... 180

All about Windows Forms	180
-------------------------------	-----

Immediate Solutions..... 186

Creating Windows Forms Applications.....	186
Adding Controls to Windows Forms	187
Disabling and Enabling Windows Forms.....	188
Changing the Title of Windows Forms	189
Setting the Border of Windows Forms	190
Displaying and Hiding the Maximize, Minimize, and Close Buttons of Windows Forms.....	191
Specifying the Initial Position of Windows Forms.....	191
Creating Multiform Windows Applications	192
Setting the Startup Form.....	195
Displaying Messages	196
Using the MsgBox Function.....	196
Using the MessageBox.Show Method	198
Using Windows Forms to Create Dialog Boxes	201
Creating a Dialog Box	201
Displaying and Reading Data from Dialog Boxes.....	202
Creating the Accept and Cancel Buttons	203
Creating Owned Windows Forms	204
Creating Always-On-Top Windows Forms.....	205
Performing Some Common Operations on Controls.....	206
Hiding and Displaying Controls.....	206
Disabling and Enabling Controls	208
Specifying the Tab Order of Controls.....	209
Specifying Access Characters for Controls.....	211
Moving and Resizing Controls.....	213
Adding a Control at Runtime	214
Handling Common Events for Windows Forms and Controls.....	215
Handling Mouse Events	215
Handling Keyboard Events.....	215
Specifying the Mouse Cursor for Windows Forms and Controls.....	218
Summary	222

Chapter 7: Windows Forms Controls - I..... 223

In Depth..... 224

The Control Class.....	224
The Button Control	230
The Label Control	231
The TextBox Control.....	232
The RichTextBox Control.....	234
The MaskedTextBox Control.....	237

Immediate Solutions..... 240

Using the Button Control.....	240
Setting the Captions of Buttons	240
Setting the Background and Foreground Colors of Buttons.....	241
Adding an Image to a Button.....	242
Handling the Click Events of Buttons	245
Handling Button Releases	246
Using the Label Control	246

Table of Contents

Formatting the Text in Labels.....	247
Handling the Click and DoubleClick Events of Labels	248
Using Labels to Specify Access Keys for Other Controls	249
Using the TextBox, RichTextBox, and MaskedTextBox Controls	249
Adding Text to TextBox, RichTextBox, and MaskedTextBox Controls	250
Accessing the Text of TextBox Controls.....	251
Creating Multiline TextBox Controls.....	252
Aligning the Text in TextBox Controls.....	253
Selecting and Replacing Text in a Text Box	254
Copying and Retrieving the Selected Text to and from the Clipboard.....	255
Restricting Characters in TextBox Controls.....	257
Accessing the Text of RichTextBox Controls.....	258
Formatting the Text in RichTextBox Controls.....	259
Creating Bold, Italic, Underlined, and Strikeout Text	260
Changing the Color of the Text	261
Indenting the Text	262
Displaying Bulleted Paragraphs in RichTextBox Controls.....	262
Saving and Loading the Text of RichTextBox Controls.....	263
Controlling the User Input with MaskedTextBox Controls.....	264
Summary	266
Chapter 8: Windows Forms Controls - II.....	267
In Depth.....	268
The RadioButton Control.....	268
The CheckBox Control	269
The ListBox Control.....	271
The CheckedListBox Control	273
The ComboBox Control	276
Immediate Solutions.....	279
Using the RadioButton Control	279
Setting the Text for the RadioButton Controls	279
Retrieving and Setting the Check State of RadioButton Controls.....	279
Creating Toggle Buttons.....	281
Using the CheckBox Control	282
Setting the Text for the CheckBox Controls	282
Retrieving and Setting the Check State of the CheckBox Controls.....	283
Creating Three-State CheckBox Controls	284
Using the ListBox Control	285
Adding Items to the ListBox Controls.....	286
Retrieving Indexes of Items from the ListBox Controls	287
Retrieving the Number of Items in the ListBox Controls	288
Sorting Items in the ListBox Controls.....	288
Retrieving Selected Items of the ListBox Controls	289
Creating the ListBox Controls with Multiple Columns.....	290
Creating Multiselect List Boxes	290
Handling the SelectedIndexChanged Event	291
Removing Items from the ListBox Controls	291
Using the CheckedListBox Control.....	292
Adding Items to the CheckedListBox Control	293
Setting the Check State of Items in the CheckedListBox Control	293
Retrieving the Check State of Items in the CheckedListBox Control	294
Handling the ItemCheck Event of the CheckedListBox Control	295
Using the ComboBox Control.....	296
Adding Items in the ComboBox Controls	296
Setting the Drop-down Style of the ComboBox Controls	297
Displaying the Selected Items of a ComboBox Control.....	297
Retrieving a Number of Items in the ComboBox Controls.....	298
Sorting the Items in a ComboBox Control	299
Storing Objects in the ComboBox Controls	299

Table of Contents

Using the AddRange Method.....	300
Handling the TextChanged and SelectedIndexChanged Events.....	301
The TextChanged Event	301
The SelectedIndexChanged Event	302
Summary	302
Chapter 9: Windows Forms Controls - III.....	303
In Depth.....	304
The ListView Control	304
The TreeView Control	306
The ImageList Control	310
The PictureBox Control.....	311
The Panel Control	313
The GroupBox Control.....	315
The TabControl Control.....	316
Immediate Solutions.....	319
Using the ListView Control.....	319
Adding Items to a ListView Control.....	319
Working with Selected Items of a ListView Control.....	320
Removing Items from ListView Controls	321
Displaying Check Boxes in a ListView Control	322
Setting the View of a ListView Control.....	322
Using the TreeView Control	324
Adding Nodes to a TreeView Control	324
Handling the AfterSelect Event.....	325
Displaying Check Boxes in a TreeView Control.....	326
Using the ImageList Control	327
Adding Images to a ImageList Control.....	327
Using Image Lists with Controls That Have the ImageList and ImageIndex Properties	329
Using Image Lists with Controls That Have the Image or BackgroundImage Property	330
Using the PictureBox Control	331
Setting Images in a PictureBox Control.....	331
Controlling the Position and Size of an Image in a PictureBox Control	333
Creating Image Maps in PictureBox Controls with the MouseDown Event	334
Using the Panel and GroupBox Controls.....	334
Grouping Other Controls in a Panel Control	335
Adding Borders to a Panel Control.....	336
Adding Scroll Bars to Panel Controls	336
Using the GroupBox Control to Group Other Controls	337
Using the TabControl Control	338
Adding Tabs to TabControl Controls	339
Adding Other Controls to the Tabs	340
Displaying Images in Tabs	340
Working with the Selected Tab	342
Summary	342
Chapter 10: Windows Forms Controls - IV	343
In Depth.....	344
The SplitContainer Control	344
The ScrollBar Control	346
The TrackBar Control	347
The ToolTip Control	350
The NotifyIcon Control.....	351
The MonthCalendar Control.....	353
The DateTimePicker Control.....	356
The Timer Control.....	359
The ProgressBar Control.....	360

Table of Contents

Immediate Solutions.....	363
Using the SplitContainer Control.....	363
Making Splitter based User Interfaces with SplitContainer Control.....	364
Changing the Orientation of SplitContainer Controls.....	366
Using the ScrollBar Controls.....	366
Specifying the Range of ScrollBar Controls.....	367
Specifying the Movement of ScrollBar Controls on Clicking.....	367
Setting and Retrieving the Current Value of ScrollBar Controls.....	368
Handling the Scroll Event of ScrollBar Controls.....	368
Displaying Images with ScrollBar Controls.....	370
Using the TrackBar Control.....	371
Setting and Retrieving the Maximum and Minimum value for the Slider.....	372
Handling Track Bar Events.....	373
Using the ToolTip Control.....	374
Setting the Tool Tips for Controls.....	374
Setting the Delay in Displaying the ToolTip Control.....	375
Using the NotifyIcon Control.....	375
Using the Icon Designer.....	376
Hiding the Notify Icon.....	377
Using the MonthCalendar and DateTimePicker Controls.....	378
Handling the Events of MonthCalendar Control.....	378
Setting and Retrieving a Date using DateTimePicker Control.....	379
Specifying the Format for DateTimePicker Controls.....	380
Using the Timer Control.....	381
Setting the Interval of Timer Controls.....	381
Enabling and Disabling Timer Controls.....	381
Handling the Tick Event.....	382
Using the ProgressBar Control.....	383
Specifying the Range of ProgressBar Controls.....	384
Setting the Current Value of ProgressBar Controls.....	384
Setting the Style of ProgressBar Controls.....	384
Summary.....	385
Chapter 11: Windows Forms Controls - V	387
In Depth.....	388
The ToolStrip Control.....	388
The ToolStripItem Class.....	391
The MenuStrip Control.....	395
The ToolStripMenuItem Class.....	396
The ContextMenuStrip Control.....	397
The StatusStrip Control.....	399
The Dialog Box Controls.....	400
The FolderBrowserDialog Control.....	401
The OpenFileDialog Control.....	401
The SaveFileDialog Control.....	403
The FontDialog Control.....	403
The ColorDialog Control.....	405
The Printing Controls.....	406
The PrintDocument Control	406
The PageSetupDialog Control.....	408
The PrintPreviewControl Control.....	410
The PrintPreviewDialog Control.....	411
The PrintDialog Control.....	412
Immediate Solutions.....	414
Using the ToolStrip Control.....	414
Adding Items to the ToolStrip Control.....	414
Handling the Click Event of ToolStripButton Control.....	416
Setting the Tool Tips for ToolStrip Items.....	416
Using the TAB Key to Navigate through the ToolStrip Items.....	417

Table of Contents

Using the MenuStrip and ContextMenuStrip Controls	418
Adding Menu Items	418
Adding Submenus	420
Disabling and Enabling Menu Items	421
Hiding and Displaying Menu Items	423
Displaying Checkmarks on Menu Items	424
Displaying a Separator between the Menu Items	425
Setting Access Keys for Menu Items	426
Setting the Shortcut Keys for Menu Items	427
Adding Images to the Menu Items	428
Creating Context Menus	430
Associating a Context Menu with another Controls	431
Adding Text Boxes and Combo Boxes to Menus and Context Menus	432
Linking Menu Items with the ToolStrip Button	435
Using the StatusStrip Control	437
Adding a Label to a StatusStrip Control	437
Displaying an Icon in the StatusStrip Control	438
Adding Split Buttons and Progress Bars in StatusStrip Controls	438
Handling the ItemClicked Event	441
Using the Dialog Box Controls	441
Using the FolderBrowserDialog Control to Browse Through Folders	441
Using the OpenFileDialog Control to Open Files	443
Using the SaveFileDialog Control	445
Using the FontDialog Control to Select Fonts	446
Using the ColorDialog Control to Select Colors	448
Using the Printing Controls	449
Using the PrintDocument Control	449
Using the PageSetupDialog Control	449
Using the PrintPreviewControl Control	450
Using the PrintPreviewDialog Control	452
Using the PrintDialog Control	453
Summary	453
Chapter 12: Introducing Windows Presentation Foundation.....	455
In Depth.....	456
Main Features of WPF 3.5	456
Improved Application Model	456
Improved Controls	457
Support for Data Validation and Data Binding Models and LINQ	457
Support for High-End Text Rendering, Typography, and Documents	457
Enhanced Support for 2-D and 3-D Graphics, Animation, and Multimedia	458
WPF 3.5 Architecture	458
PresentationFramework	459
PresentationCore	459
WindowsBase	459
MIL or Milcore	459
WPF 3.5 Class Hierarchy	460
The System.Windows.Threading.DispatcherObject Class	460
The System.Windows.DependencyObject Class	461
The System.Windows.Freezable Class	461
The System.Windows.Media.Visual Class	461
The System.Windows.UIElement Class	462
The System.Windows.FrameworkElement Class	462
The System.Windows.Controls.Control Class	462
The System.Windows.Controls.Panel Class	462
The System.Windows.Shapes.Shape Class	463
The System.Windows.ContentElement Class	463
WPF 3.5 Application Model	463
Types of WPF Applications	463
Standalone WPF Applications	463

Table of Contents

XAML Browser Applications.....	468
The Application Class	470
Exploring the WPF 3.5 Designer Interface.....	472
Design View.....	473
Grid Rails, Gridlines, and Gridline Indicators	474
Zoom Control and Fit in View Button	474
Move and Resize Handles	474
Margin Lines and Margin Stubs.....	475
Snaplines	477
XAML View	477
Split View Bar.....	478
Tag Navigator.....	480
Solution Explorer	480
Properties Window.....	481
Toolbox	482
Document Outline Window.....	482
Using XAML in WPF 3.5 Applications.....	483
XAML Elements.....	483
Namespaces and XAML	484
XAML Property Syntax.....	485
Markup Extensions.....	486
WPF Properties.....	488
Dependency Properties.....	488
Precedence of Dependency Property Values	489
Property Value Inheritance	491
Dependency Property Validation and Coercion Callbacks	491
Dependency Property Metadata	492
Custom Dependency Properties	494
Attached Properties.....	496
WPF Events.....	498
Routed Events	498
Routing Strategies.....	499
Handlers for Routed Events.....	501
Attached Events	503
Lifetime Events.....	504
Application Lifetime Events	504
Window Lifetime Events	505
Working with Dialog Boxes in WPF Applications.....	506
The MessageBox Class	506
The OpenFileDialog Class	506
The SaveFileDialog Class.....	507
The PrintDialog Class	507
Compiling and Running WPF 3.5 applications	508
Immediate Solutions.....	511
Working with WPF Windows.....	511
Adding Rows and Columns to a Grid Through XAML.....	514
Creating a Dialog Box in a WPF 3.5 Application.....	516
Using a Message Box.....	516
Using the Print Dialog Box	517
Working with Custom Routed Events	518
Summary	521
Chapter 13: Working with WPF 3.5 Controls, Resources, Styles, Templates, and Commands	523
In Depth.....	524
WPF 3.5 Controls.....	524
Container Controls	524
Grid Control	525
UniformGrid Control	526
Canvas Control	527
DockPanel Control	528

Table of Contents

StackPanel Control	530
WrapPanel Control.....	532
Simple Controls.....	533
TextBox Control.....	533
RichTextBox Control	535
PasswordBox Control	536
ScrollBar Control	537
ProgressBar Control	539
Slider Control	540
Content Controls.....	541
Button Control.....	542
Label Control.....	543
RadioButton Control	544
CheckBox Control.....	545
ListBoxItem Control	546
StatusBarItem Control	547
ScrollViewer Control.....	547
ToolTip Control	549
ContentControl Control.....	549
Window Control.....	550
Frame Control	552
NavigationWindow Control	554
UserControl Control.....	554
Headered Content Controls	555
Expander Control	555
GroupBox Control	556
TabItem Control.....	557
ItemsControls Control.....	558
ContextMenu Control	558
StatusBar Control.....	559
Menu Control	560
ListBox Control	561
ComboBox Control	562
ListView Control	564
TreeView Control	565
TabControl Control	566
HeaderedItems Controls.....	567
TreeViewItem Control	568
MenuItem Control.....	568
ToolBar Control	569
Miscellaneous Controls.....	571
Border Control	572
TextBlock Control	573
Viewbox Control.....	574
AccessText Control	576
GridSplitter Control	576
VirtualizingStackPanel Control.....	578
Resources.....	578
Static Resources	579
Dynamic Resources	579
Styles and Templates.....	580
Styles in WPF 3.5.....	580
Templates	581
The ControlTemplate Tempalte	581
The DataTemplate Template	581
Template Binding	582
Triggers.....	582
Property Triggers.....	582
Event Triggers	582
WPF Commands	583
Command Sources.....	583
Command Targets	584

Table of Contents

Command Binding	584
Interoperability between Windows Forms and a WPF 3.5 Application	584
Immediate Solutions.....	585
Using WPF Controls	585
Adding Controls through XAML Code	585
Adding Controls in the Code-Behind File	586
Using Dynamic Layout of Controls	587
Using the DockPanel Control	587
Using the StackPanel Control	588
Using the WrapPanel Control	589
Setting the Absolute Position of Controls	589
Adding Borders to Controls	590
Using the PasswordBox Control	591
Creating a Scrollable Area in a WPF Application	592
Using the Slider Control	592
Using the Viewbox Control.....	593
Assigning the Access Key for Controls	594
Using the Expander Control	595
Using the NavigationWindow and Frames Controls	596
Using the Resources, Styles, and Templates.....	597
Accessing Resources from Code.....	597
Using Dynamic Resources.....	598
Setting Styles through Resources	599
Extending an Existing Style	600
Using Data Template to Change the Appearance of the Content of Control	601
Using the Control Template.....	602
Using the DataTemplate Template	603
Handling Events in Styles using the EventSetter Class	604
Using Triggers	605
Setting the Value of Properties using Triggers	605
Performing Actions using Triggers.....	606
Using WPF Commands with Controls	608
Hosting a Windows Forms Control in a WPF Application	609
Hosting a WPF Control in a Windows Forms Application	610
Summary	612
Chapter 14: Using Graphics and Multimedia in Windows Forms and WPF.....	613
In Depth.....	614
Graphics in Windows Forms Applications	614
GDI+ Managed Class Interface.....	614
Basic GDI+ Managed Classes	615
The Graphics Class	615
The Pen Class	618
The Brush Class.....	619
Color Structure in Windows Form	620
Graphics, Animation, and Multimedia in WPF 3.5.....	621
2-D Graphics.....	622
Shapes in WPF.....	622
Geometries in WPF.....	623
Brushes in WPF	625
The Drawing Class	629
The DrawingContext Class	630
3-D Graphics.....	631
The Viewport3D Class	631
Cameras.....	632
3-D Models and Materials	633
Lights	635
Animation in WPF 3.5.....	635
Types of Animation.....	635
Animation Classes.....	638

Table of Contents

Essentials of Animation.....	641
Event Triggers and Animation.....	644
Key Frames.....	644
Multimedia in WPF 3.5.....	645
WPF Images.....	645
Audio and Video.....	647
Immediate Solutions.....	652
Using Graphics in Windows Forms.....	652
Using 2-D Graphics in WPF 3.5	654
Using 2-D Shapes.....	654
Creating Stretchable Shapes.....	655
Drawing Geometry.....	656
Combining Multiple Geometries.....	657
Transforming Shapes	658
Using the Path Shape and PathGeometry Geometry.....	659
Using Brushes.....	661
LinearGradientBrush and RadialGradientBrush.....	661
ImageBrush.....	662
DrawingBrush and VisualBrush	663
Changing the Tile Size and the Pattern of Brushes	664
Creating Reflections using VisualBrush.....	665
Preserving the Aspect Ratio of Image	667
Using 3-D Graphics in WPF 3.5	668
Creating 3-D Models	668
Using Materials on 3-D Models.....	669
Using DrawingBrush to Apply Material on 3-D Models.....	669
Adding Cameras.....	671
OrthographicCamera	671
PerspectiveCamera.....	672
Adding Lights	674
Transforming 3-D Models	678
TranslateTransform3D	678
ScaleTransform3D	679
RotateTransform3D	681
Using Animation in WPF 3.5.....	682
Creating Animations Using Storyboards.....	683
Using Event Triggers	683
Using Triggers.....	685
Changing the Speed of Animations	686
Reversing the Animation.....	688
Controlling the Behavior of Animation	689
Specifying the Behavior of Animation after Ending	690
Running Multiple Animations Simultaneously.....	691
Controlling Storyboards Interactively.....	692
In XAML	692
In Code	694
Using DoubleAnimation to Transform Controls.....	695
Creating Local Animations	697
Using Keyframe Animation	698
Animating Rectangles.....	699
Animating Strings.....	700
Controlling the Timing of Keyframe Animations	701
Animating Geometries.....	703
Using Animation with 3-D Models.....	704
Animating Cameras	704
Rotating 3-D Model Using Rotation3DAnimation.....	706
Using Multimedia in WPF 3.5.....	708
Displaying Images using the Image Control.....	708
Transforming Images	709
Stretching Images.....	710
Using MediaElement to Control the Media Playback	711

Table of Contents

Adding Media Using MediaPlayer	713
Using Storyboard to Control the Media Playback.....	714
Playing a Media on a User Event	716
Transforming a Video in MediaElement.....	719
Summary	720
Part IV - ASP.NET 3.5	
Chapter 15: Introducing ASP.NET 3.5 and Web Forms	721
In Depth.....	722
New Features in ASP.NET 3.5	722
ASP.NET AJAX Support.....	722
The ListView Control	723
The DataPager Control	723
Support for WCF Services	723
WCF Support for RSS, JSON and Partial Trust.....	723
Support for Nested Master Pages at Design Time	723
Multi-targeting Support.....	723
Merge Tool in ASP.NET 3.5	724
IntelliSense for JavaScript and ASP.NET AJAX.....	724
Improved Support for JavaScript Debugging.....	725
Types of ASP.NET Web Sites.....	726
Local IIS	726
File System Based.....	726
FTP-Based	726
Remote IIS	726
The Web Application Project	727
Structure of an ASP.NET Web Site	727
ASP.NET Application Folders	727
The App_Browsers Folder	727
The App_Code Folder.....	728
The App_Data Folder	728
The App_GlobalResources Folder	728
The App_LocalResources Folder	729
The App_Themes Folder	729
The App_WebReferences Folder.....	729
The bin Folder	729
File Types in ASP.NET Web Sites	729
The ASP.NET Life Cycle	731
ASP.NET Application Life Cycle on IIS 7.0.....	731
ASP.NET Page Life Cycle.....	734
Different Stages of an ASP.NET Page	734
ASP.NET Pages Life Cycle Events	734
The ASP.NET Compilation Process	735
Compiling on First Request.....	735
Recompiling on Change.....	735
Compilation Dependencies.....	736
ASP.NET 3.5 Coding Models	736
The Inline Coding Model.....	736
Code-Behind Page Model.....	738
The System.Web.UI.Page Class	740
ASP.NET Web Page Syntax.....	741
Web Page Directives.....	741
The @ Page Directive.....	742
The @ Control Directive.....	742
The @ Import Directive.....	742
The @ Implements Directive	742
The @ Register Directive.....	742
The @ Assembly Directive.....	743
The @ Master Directive.....	743

Table of Contents

The @WebHandler Directive	743
The @ PreviousPageType Directive.....	743
The @ MasterType Directive.....	743
The @ OutputCache Directive	743
The @ Reference Directive.....	743
Form Elements	744
Web Server Controls	744
Immediate Solutions.....	745
Creating a New Web Site.....	745
Using File System based Location.....	745
Using HTTP-based Location.....	747
Using FTP-Based Location	748
Using Web Application Project	750
Setting the Title Bar Text of a Web Form	750
Adding a Background Color to a Web Form.....	751
Adding a Background Image to a Web Form	752
Adding Controls to a Web Form	753
Hiding and Displaying Controls.....	754
Disabling and Enabling Controls	755
Setting the Captions and Fonts of Controls	756
Setting the Tab Order of a Control.....	756
Setting the Styles of Controls.....	757
Adding Tool Tips to Controls.....	759
Specifying Access Characters for Controls.....	760
Running a Web Application.....	760
Creating a Multiform Web Application	761
Displaying the Life Cycle of a Page	762
Handling Events.....	764
Web Forms Navigation and Cross-Page Posting.....	766
Summary	770
Chapter 16: Standard Web Server Controls	771
In Depth.....	772
The Control Class.....	772
The WebControl Class.....	774
The Button Control	775
The TextBox Control.....	777
The Label Control	778
The HyperLink Control	779
The HiddenField Control.....	780
The FileUpload Control	780
The RadioButton Control.....	781
The CheckBox Control	782
The ListBox Control.....	784
The DropDownList Control	785
The Image Control	786
The Calendar Control.....	787
Immediate Solutions.....	790
Using the Button Control.....	790
Setting the Caption and Style of Buttons	791
Using the TextBox Control	793
Setting the Text Property of the TextBox Control.....	794
Creating Multiline TextBox Control	794
Creating Password TextBox Control	795
Creating Read-Only TextBox Control	796
Using the Label Control	797
Setting the Text Property and Style of Labels	798
Using the HyperLink Control.....	799

Table of Contents

Setting the Text property of the HyperLink Control	800
Setting the NavigateUrl Property of the HyperLink Control.....	800
Using the HiddenField Control	801
Setting the Value Property of the HiddenField Control.....	803
Using the FileUpload Control.....	803
Limiting the File Size in FileUpload Control.....	806
Using the RadioButton Control	808
Using the CheckBox Control.....	811
Using the ListBox Control	813
Creating Single-Selection List Boxes.....	815
Creating Multiple-Selection List Boxes.....	816
Adding and Removing Items from the ListBox.....	817
Using the DropDownList Control.....	820
Adding and Removing Items from the DropDownList	822
Using the Image Control.....	823
Using the Calendar Control	825
Summary	827
Chapter 17: Navigation Controls in ASP.NET 3.5	829
In Depth.....	830
What is Navigation?	830
The Menu Web Server Control	830
The TreeView Web Server Control	834
Immediate Solutions.....	837
Using the Menu Control	837
Creating Menus at Design Time.....	837
Applying Styles to the Menu Control.....	839
Adding Styles to Static Items.....	839
Adding Styles to Dynamic Items	842
Creating Menus using the XMLDataSource Control	845
Using the TreeView Control	848
Adding Nodes at Design Time.....	848
Adding Nodes using the XMLDataSource Control	851
Adding Nodes from Database	853
Summary	858
Chapter 18: Login and Web Parts Controls in ASP.NET 3.5	859
In Depth.....	860
Introducing Login Controls.....	860
The Login Control.....	860
The LoginView Control	863
The LoginName Control.....	864
The LoginStatus Control.....	865
The PasswordRecovery Control.....	866
The ChangePassword Control	868
The CreateUserWizard Control.....	871
Introducing Web Parts Controls.....	875
Display Modes of Web Parts.....	875
The WebPartManager Control.....	875
The ProxyWebPartManager Control	879
The WebPartZone Control	880
The CatalogZone Control	881
The DeclarativeCatalogPart Control	882
The PageCatalogPart Control	883
The ImportCatalogPart Control	884
The EditorZone Control.....	885
The LayoutEditorPart Control	886
The AppearanceEditorPart Control	887
The PropertyGridEditorPart Control	889

Table of Contents

The BehaviorEditorPart Control	890
Immediate Solutions.....	892
Using the Login and LoginView Controls.....	892
Using the LoginName and LoginStatus Controls.....	899
Using the CreateUserWizard Control	901
Using the PasswordRecovery and ChangePassword Controls.....	903
Creating the WebPartManager Control in Code	909
Creating the WebPartZone Control in Code	911
Creating the CatalogZone Control in Code.....	912
Creating the EditorZone Control in Code	914
Creating Custom Web Parts.....	916
Summary	921
Chapter 19: Enhancing Web Applications with Silverlight.....	923
In Depth.....	924
Main Features of Silverlight	924
Improved Programming Model.....	925
Comprehensive UI Framework.....	925
Support for Deep Zoom Technology.....	925
Support for 2-D Graphics, Animations, and Multimedia	925
Support for Networking	926
Architecture of Silverlight	926
The .NET Framework for Silverlight	926
The Core Presentation Framework	927
Installation of Silverlight	927
Silverlight Applications in Visual Studio 2008	932
Assemblies and Files in Silverlight Applications	933
The HTML Host Page (Test Page).....	934
The JavaScript Helper File.....	936
The XAML Files	937
The Application Package.....	939
Instantiation of the Silverlight Plug-in.....	940
Controls in Silverlight Applications	943
The Calendar Control	947
The DatePicker Control	948
The GridSplitter Control.....	949
The HyperlinkButton Control	950
The MediaElement Control.....	951
The Popup Control.....	953
The TabControl Control	954
Silverlight and ASP.NET	956
ASP.NET Namespaces for Silverlight	958
The Sys.UI.Silverlight Namespace.....	958
The System.Web.UI.Design.SilverlightControls Namespace	959
The System.Web.UI.SilverlightControls Namespace	959
ASP.NET Server Controls for Silverlight	960
Silverlight Server Control.....	960
MediaPlayer Server Control	962
Immediate Solutions.....	964
Creating a Simple Silverlight Application	964
Changing the Size of the Silverlight Plug-in	965
Using Silverlight Controls	968
Using the Calendar Control	968
Using the DatePicker Control	975
Using the GridSplitter Control	979
Using the HyperlinkButton Control	980
Using the MediaElement Control	982
Using the Popup Control.....	984
Using the TabControl Control	987

Table of Contents

Integrating Silverlight with ASP.NET Applications	990
Using the Silverlight Control.....	990
Using the MediaPlayer Control to Embed Media	992
Changing the Media Skin.....	994
Adding Chapters in a Video	995
Summary	996
Part V - Services and Deployment	
Chapter 20: ASP.NET 3.5 Web Services.....	997
In Depth.....	998
What is Web Service?	998
Infrastructure of ASP.NET Web Services.....	999
Web Services Directory	1000
Web Services Discovery.....	1000
Web Services Description	1000
Web Service Description Language.....	1001
Web Services Wire Format	1003
HTTP-GET and HTTP-POST	1003
Simple Object Access Protocol.....	1004
Code Model of ASP.NET Web Services	1005
The WebService Directive	1005
The Code-Behind File.....	1006
The WebService Attribute	1006
The System.Web.Services.WebService Class.....	1006
The WebMethod Attribute.....	1007
Web Service Properties	1007
Application	1008
Context	1008
Server	1009
Session	1009
ASP.NET AJAX and Web Services.....	1010
ASP.NET AJAX Client Architecture for Web Services	1010
ASP.NET AJAX Server Architecture for Web Services.....	1011
Securing Web Services	1012
Encryption and Message-Based Security.....	1012
Authentication and Access Controls for Services.....	1012
Immediate Solutions.....	1013
Creating ASP.NET Web Services	1013
Creating a Web Service Project.....	1013
Declaring a Web Service	1014
Setting the WebService Attribute	1015
Declaring Functions for the Web Service.....	1016
Using ASP.NET Web Service	1018
Creating a Web Application to use the Web Service	1018
Adding Reference of the Web Service	1020
Sharing Data across Web Services.....	1022
Communicating Web Services Asynchronously	1027
Working with ASP.NET AJAX-Enabled Web Services.	1029
Creating the ASP.NET AJAX-Enabled Web Service	1030
Calling the ASP.NET AJAX Enabled Web Service From Script.....	1031
Using the UpdatePanel Control with a Web Service	1033
Summary	1036
Chapter 21: Introducing Windows Communication Foundation	1037
In Depth.....	1038
WCF Client-Server Architecture.....	1038
Instancing Model of WCF Services	1038
per-call Instancing Service.....	1039

Table of Contents

per-session Instancing Service	1040
Sharable Instancing Service.....	1041
Singleton Instancing Service	1042
WCF Layers.....	1042
Contracts	1043
Service Runtime	1043
Messaging	1044
Hosting and Activation.....	1044
WCF Endpoints	1045
Endpoint Addresses	1046
Bindings.....	1046
System-Provided Bindings.....	1047
Service Contracts	1048
Operation Contract.....	1048
Message Patterns	1049
Data Contracts.....	1050
Behaviors.....	1051
Configuration of WCF Services	1051
The web.config File	1051
The WCF Configuration Editor Tool.....	1052
WCF Clients.....	1053
WCF Service Identity	1054
WCF and ASP.NET AJAX	1054
Immediate Solutions.....	1056
Creating WCF Services.....	1056
Creating a Service Contract and Defining the Operations.....	1056
Implementing the Service Contract	1056
Configuring the Service	1057
Specifying Service Bindings.....	1058
Specifying Endpoints	1060
Specifying the Service Behavior	1060
Hosting WCF Services.....	1061
Self-hosting a WCF Service	1062
Hosting WCF Services in Windows Services.....	1064
Hosting WCF Services in IIS.....	1068
Using the WCF Service.....	1072
Creating a WCF Client	1072
Adding the Reference of WCF service	1075
Using the Svchost.exe	1076
Configuring the WCF Client	1077
Calling Operations of a WCF Service	1077
Using WCF Services with ASP.NET AJAX	1079
Creating an ASP.NET AJAX Enabled WCF Service.....	1079
Calling WCF Services from Client-side Scripts.....	1082
Summary	1085
Chapter 22: Deploying Windows and Web Applications	1087
In Depth.....	1088
Enhancements in Deployment Techniques	1088
ClickOnce Deployment.....	1088
XAML Browser Applications Support.....	1089
Manifest Generation under UAC on Windows Vista	1089
Windows Installer Deployment	1089
Windows Vista Support	1090
Publishing an Application Using the ClickOnce Deployment Technique	1090
Application Cache	1091
Security	1091
Deploying an Application Using the Windows Installer Deployment Technique	1092
Distributable Media.....	1092
Web Setup Projects	1092

Table of Contents

Cab File Projects.....	1092
XCOPY Deployment.....	1093
Advance Options	1093
File System Editor.....	1094
Registry Editor	1094
File Types Editor.....	1095
User Interface Editor	1095
Custom Actions Editor.....	1096
Launch Conditions Editor	1097
Immediate Solutions.....	1098
Deploying a Windows Application Using Windows Installer.....	1098
Deploying a Windows Application Using ClickOnce	1105
Building Self-Updating Applications	1109
Web Application Deployment.....	1109
Windows Installer.....	1109
XCOPY Deployment	1113
WPF Application Deployment.....	1114
XBAP Deployment Using Windows Installer.....	1116
Summary	1119

Part VI - ADO.NET and LINQ

Chapter 23: Data Access with ADO.NET.....	1121
In Depth.....	1122
Introducing Databases	1122
Introducing SQL.....	1122
The SELECT Statement	1123
The WHERE Clause.....	1123
The LIKE Clause	1123
The DISTINCT Clause.....	1123
The Logical Operations.....	1124
The ORDER BY Clause	1124
The GROUP BY Clause	1124
The DELETE Statement	1124
The UPDATE Statement	1124
Joining Tables	1124
The DROP Statement	1125
Introducing ADO.NET.....	1125
Describing the Architecture of ADO.NET	1126
Data Providers in ADO.NET	1127
DataSet	1128
DataReader	1129
ADO.NET Entity Framework	1129
Immediate Solutions.....	1131
Creating Connection Strings	1131
Syntax for connection strings.....	1134
Creating a Connection to a Database.....	1135
SQL Server Database.....	1135
OLEDB Database	1140
Using OLE DB Adapter for Excel File	1146
ODBC Data Source	1147
Creating a Command Object.....	1155
Working with DataAdapters.....	1156
Creating DataSet from DataAdapter	1156
Paging with Data Adapters.....	1157
Updating with Data Adapters	1158
Adding Multiple Tables to a DataSet	1159
Creating DataView	1160

Table of Contents

Using DataReader to Work with Databases	1162
Summary	1163
Chapter 24: Data Binding in Windows Forms and WPF Applications.....	1165
In Depth.....	1166
Basic Data Binding Concepts	1166
Types of Data Binding.....	1166
Simple Data Binding	1167
Complex Data Binding.....	1167
Binding Data to Windows Forms Controls	1167
Data Binding in Windows Presentation Foundation.....	1168
Data Flow Directions in WPF	1168
OneTime Data Binding	1168
OneWay Data Binding.....	1168
TwoWay Data Binding	1168
OneWayToSource Data Binding.....	1168
Sources of Data Binding.....	1168
CLR Objects	1169
ADO.NET	1169
XML.....	1169
DependencyObject.....	1169
Declaration of Data Binding.....	1169
XAML Based Binding.....	1169
Code Based Binding	1170
Binding Path Syntax	1170
Binding to Collections	1170
ADO.NET Data Services	1170
Immediate Solutions.....	1172
Creating a Simple Data Binding in Windows Forms.....	1172
Creating a Complex Data Binding in Windows Forms	1176
Binding Windows Forms Controls	1177
Text Boxes and Labels	1177
Check Boxes	1178
Combo Boxes	1180
List Boxes	1181
Checked List Boxes	1182
MenuStrip and StatusStrip Controls.....	1183
Using the BindingContext Class.....	1185
Navigation in DataSet	1185
Displaying the Current Location.....	1187
Moving to the Next Record	1187
Moving to the Previous Record	1188
Moving to the First Record	1188
Moving to the Last Record	1188
Using Parameterized SQL Queries	1188
Simple Binding in WPF	1189
Binding to CLR Object in WPF	1191
Binding to ADO.NET objects in WPF	1194
Binding to XML Objects in WPF	1196
DependencyObject Bindings in WPF	1197
Implementing Validation Rules with Data Binding	1198
Data binding to Web Services in WPF	1201
Creating ADO.NET Data Service Application	1205
Summary	1208
Chapter 25: Data Binding in ASP.NET Applications	1209
In Depth.....	1210
Data Source Controls in ASP.NET	1210
The SqlDataSource Control	1211

Table of Contents

The AccessDataSource Control	1213
The LinqDataSource Control	1214
The ObjectDataSource Control	1216
The XmlDataSource Control	1218
The SiteMapDataSource Control.....	1220
Data Bound Controls in ASP.NET	1221
The GridView Control	1221
The DataList Control.....	1225
The DetailsView Control	1227
The FormView Control	1231
The ListView Control	1235
The Repeater Control	1238
The DataPager Control	1239
Working with Data Source Control Parameters	1240
Parameter Types	1240
Data Source Controls and Parameters.....	1241
Data Binding with Silverlight	1241
Types of Data Binding in Silverlight	1242
Binding Object.....	1242
Data Context.....	1242
Converters.....	1242
DataTemplate and ObservableCollection	1243
Data binding using Networking API	1243
Immediate Solutions.....	1244
Using the GridView Control	1244
Creating a GridView	1244
Data Binding with GridView Control	1244
Customizing the appearance of the GridView Control	1251
Handling GridView Events.....	1253
Using the DetailsView Control.....	1255
Creating a DetailsView Control.....	1255
Data Binding with the DetailsView Control	1255
Using the FormView Control.....	1260
Creating a FormView	1260
Inserting and Deleting Data with the ListView Control	1263
Paging Data with the ListView and DataPager Controls	1271
Using the Repeater Control.....	1278
Creating a Repeater	1278
Using Data Readers	1280
DataBinding with Silverlight Application.....	1281
Summary	1288
Chapter 26: Working with LINQ	1289
In Depth.....	1290
LINQ Queries	1290
Data Sources in LINQ Queries	1290
Deferred Execution and Immediate Execution	1291
Standard Query Operators	1291
The Filtering Operators.....	1292
The Projection Operators.....	1292
The Sorting Operators.....	1293
The Join Operators	1293
The Grouping Operators	1293
The Quantifier Operators	1294
The Partitioning Operators	1294
The Set Operators	1294
The Element Operators	1295
The Aggregate Operators	1295
The Conversion Operators	1295

Table of Contents

The Generation Operators.....	1296
LINQ to Objects.....	1296
Strings	1296
Reflections	1296
File Directories	1297
Introducing LINQ to ADO.NET.....	1297
LINQ to DataSet.....	1297
LINQ to SQL.....	1298
Introducing LINQ to XML.....	1298
Difference Between LINQ to XML and the DOM Method	1299
Working with XML Trees in LINQ	1299
The LinqDataSource Control	1299
Extension Methods	1302
Anonymous Types.....	1302
Lambda Expressions.....	1302
Immediate Solutions.....	1303
Creating a LINQ to DataSet Application	1303
Creating a LINQ to SQL Application	1304
Creating a LINQ to Object Application	1306
Creating a LINQ to XML Application	1307
A Simple LinqDataSource Application	1309
Using a LINQ Extension Method	1313
Using the Where Clause.....	1314
Type Filtering	1315
Using the Projection Operators.....	1315
Using the Sorting Operators.....	1316
Using the Join Clause	1317
Using the Grouping Operators.....	1318
Grouping with Nested Objects	1319
Using the Partitioning Operators	1320
Using the Set Operators	1321
Using the Aggregate Operators.....	1322
Using the Conversion Operators.....	1323
Using the Generation Operators.....	1324
Summary	1325

Part VII - Advanced Topics

Chapter 27: Working with Windows Workflow Foundation.....	1327
In Depth.....	1328
Workflow Principles.....	1328
Components of Windows Workflow Foundation.....	1328
Host Process.....	1329
Runtime Services.....	1329
Runtime Engine.....	1329
Workflow	1329
Base Activity Library.....	1330
Custom Activities	1331
Types of Workflows.....	1332
The Sequential Workflow	1332
The State Machine Workflow	1332
Conditions and Rules in Workflows.....	1333
Simple Conditions	1333
The CAG Activity	1333
The PolicyActivity Activity	1334
Immediate Solutions.....	1335
Developing a Simple Workflow Application	1335

Table of Contents

Implementing Conditions in Workflows	1336
Using Workflows with Windows Forms	1339
Summary	1342
Chapter 28: Threading in Visual Basic 2008.....	1343
In Depth.....	1344
What is Threading?	1344
Difference between Processes and Threads.....	1345
The Thread Class.....	1346
Multithreading	1348
Thread Priorities.....	1348
Thread States.....	1349
Thread Synchronization.....	1351
Immediate Solutions.....	1352
Creating a Thread	1352
Starting a Thread.....	1352
Putting a Thread to Sleep	1353
Suspending a Thread.....	1354
Resuming a Thread.....	1355
Stopping a Thread.....	1356
Creating a Multithreaded Application.....	1357
Setting a Thread's Priority.....	1359
Determining the Thread State.....	1360
Joining Threads	1362
Synchronizing Threads	1364
Summary	1367
Chapter 29: Collections and Generics	1369
In Depth.....	1370
Understanding Collections.....	1370
Collection Classes in .NET.....	1371
The ArrayList Class	1371
The Hashtable Class	1373
The SortedList Class	1374
The Stack Class	1375
The Queue Class	1376
The BitArray Class	1377
Limitations of Collection Classes	1379
Generics	1380
Generic Collection Classes in .NET.....	1381
The Generic List(Of T) Class	1381
The Generic LinkedList(of T) Class	1383
The Generic SortedList(Of TKey, TValue) Class	1384
The Generic Dictionary(Of TKey, TValue) Class	1385
The Generic SortedDictionary(Of TKey, TValue) Class	1386
The Generic Stack(Of T) Class	1386
The Generic Queue(Of T) Class.....	1387
The Generic HashSet(Of T) Class	1388
Immediate Solutions.....	1389
Working with Collection Classes	1389
Using the ArrayList Class.....	1389
Creating and Adding Items to the ArrayList Object.....	1389
Sorting Items	1391
Searching an Item	1391
Using the Hashtable class.....	1392
Creating and Adding a Key/Value Pair Collection.....	1393
Determining whether a Collection contains a Key.....	1394
Determining whether Collection contains a Value	1395

Table of Contents

Using the SortedList Class.....	1396
Creating and Adding a Key/Value Pair Collection.....	1396
Retrieving Index of Key from the Collection	1398
Retrieving Index of Value from the Collection	1399
Using the Stack Class	1400
Creating and Adding Items to the Stack Object	1400
Pushing Items into the Stack Object	1401
Popping Items out of the Stack Object	1402
Using the Queue Class.....	1403
Creating and Adding Items to the Queue Object.....	1403
Enqueuing Items into the Queue Object.....	1404
Dequeuing Items out of the Queue Object	1405
Using the BitArray Class	1406
Creating and Adding Items to the BitArray Object	1406
Performing the Bitwise Xor Operation.....	1407
Using the Not Operator in a BitArray Object.....	1408
Working with Generic Collection Classes	1409
Using the Generic List(of T) Class.....	1409
Creating and Adding Items to the List(of T) Object.....	1409
Inserting an Item to the List(of T) Object	1411
Removing an Item from the List(of T) Object	1412
Reversing Items in the List(of T) Object.....	1413
Using the Generic LinkedList(of T) Class	1413
Creating and Adding Nodes to the LinkedList(of T) Object	1413
Using the AddFirst Method.....	1415
Using the AddLast Method	1416
Using the RemoveFirst method.....	1417
Using the AddAfter method.....	1417
Using the AddBefore method	1418
Using the RemoveLast method	1420
Using the Generic SortedList(Of TKey, TValue) Class.....	1420
Creating and Adding a Key/Value Pair Collection.....	1420
Retrieving Index of Key from the Collection	1422
Retrieving Index of Value from the Collection	1423
Using the Generic Dictionary(Of TKey, TValue) Class	1424
Creating and Adding a Key/Value Pair Collection.....	1424
Determining whether a Collection contains a Key.....	1426
Determining whether or not a Collection contains a Value.....	1426
Using the Generic SortedDictionary(Of TKey, TValue) Class.....	1427
Creating and Adding a Key/Value Pair Collection	1427
Determining whether or not a Collection Contains a Key	1429
Determining whether or not a Collection Contains a Value	1429
Using the Generic Stack(Of T) Class.....	1430
Creating and Adding Items to the Stack(Of T) Object.....	1430
Pushing Items into the Stack(Of T) Object.....	1431
Popping Items out of the Stack(Of T) Object	1432
Using the Generic Queue(Of T) Class	1433
Creating and Adding Items to the Queue(Of T) Object	1433
Enqueuing Items into the Queue(Of T) Object	1434
Dequeuing Items out of the Queue(Of T) Object	1435
Using the Generic HashSet(Of T) Class.....	1436
Creating and Adding Items to the HashSet(Of T) Object	1436
Retrieving Items from the HashSet(Of T) Object	1437
Calculating Union of Two Hash Sets.....	1438
Calculating Intersection of Two Hash Sets	1438
Creating Your Own Generic Collection Classes	1439
Defining a Generic Class	1439
Creating a Generic Method	1440
Applying Constraints to Generic Code	1440
Summary	1448

Table of Contents

Chapter 30: Working with XML and .NET.....	1449
<i>In Depth.....</i>	1450
Support for XML in .NET Framework 3.5	1450
The System.Xml Namespace	1450
Working with Streamed XML.....	1451
The XmlReader Class	1451
Validation with the XmlReader Class	1452
The XmlWriter Class	1452
Implementing DOM in .NET Framework 3.5.....	1452
XPath and XSLT in .NET Framework 3.5.....	1453
The System.Xml.XPath Namespace.....	1454
The XPathDocument Class.....	1454
The XPathNavigator Class	1454
The XPathNodeIterator Class	1455
The System.Xml.Xsl Namespace	1455
Using XML with ADO.NET	1455
Object Serialization with XML.....	1456
 Immediate Solutions.....	1457
Working with Streamed XML.....	1457
Reading Data	1457
Reading Validated Data.....	1460
Writing Data	1463
Implementing DOM in .NET	1464
Finding Elements by Tag Name	1464
Inserting Nodes.....	1466
Navigating and Transforming Data.....	1468
Navigating and Finding Elements by Attribute Values	1468
Transforming XML	1469
Converting ADO.NET and XML Data	1470
Converting ADO.NET Data into XML Data.....	1470
Writing Data into a DiffGram.....	1472
Implementing Object Serialization with XML	1473
Serialization with Source Code Access	1474
Serialization without Source Code Access.....	1476
Summary	1478
Chapter 31: The My Object.....	1479
<i>In Depth.....</i>	1480
The My.Computer Object	1480
The My.Computer.Audio Object.....	1480
The My.Computer.Clipboard Object	1481
The My.Computer.Clock Object.....	1482
The My.Computer.FileSystem Object.....	1482
The My.Computer.Info Object	1483
The My.Computer.Keyboard Object	1484
The My.Computer.Mouse Object	1484
The My.Computer.Name Object	1485
The My.Computer.Network Object	1485
The My.Computer.Ports Object	1485
The My.Computer.Registry Object	1485
The My.Computer.Screen Object	1486
The My.Application Object	1487
The My.Application.Log Object	1487
The My.Application.Info Object	1487
The My.Forms Object	1488
The My.User Object	1488
The My.WebServices Object.....	1489
 Immediate Solutions.....	1490

Table of Contents

Using the My.Computer Object.....	1490
Using the My.Application Object.....	1495
Using the My.Forms Object.....	1498
Using the My.User Object.....	1503
Using the My.WebServices Object	1505
Summary	1508
Chapter 32: .NET Assemblies	1509
In Depth.....	1510
.NET Assemblies	1510
Components of Assembly	1510
Assembly Manifest.....	1510
MSIL Source Code	1514
Type Metadata	1514
Resources	1514
Types of Assemblies.....	1514
Shared Assemblies.....	1514
Private Assemblies	1515
Attributes of an Assembly.....	1515
Assembly Identity Attributes	1515
Informational Attributes.....	1516
Assembly Manifest Attributes.....	1516
Strong Name Attributes.....	1516
Assembly Signing	1517
Strong Names.....	1517
Delayed Signing.....	1518
Using the Strong Name Tool	1518
Storage for Assemblies.....	1520
Global Assembly Cache.....	1520
Assembly Information File	1521
Version Format.....	1522
Configuration Files for Assemblies.....	1522
Probing.....	1522
CodeBase.....	1523
Publisher Policy	1523
Immediate Solutions.....	1525
Creating a Shared Assembly	1525
Strong Naming the Assembly	1525
Putting the Assembly in Global Assembly Cache.....	1526
Creating a Simple Client	1526
Creating a New Version of the Shared Assembly	1527
Using New Version of Shared Assembly.....	1528
Side-by-Side Execution of Shared Assemblies.....	1530
Creating a Private Assembly	1531
Creating a Multifile Assembly	1532
Native Image Generation.....	1535
Delayed Signing	1535
Configuring Assembly Lookup	1536
Configuring Probing	1537
Through Configuration Tool	1537
Manual Way	1538
Configuring CodeBase for Signed Assemblies	1538
Through Configuration Tool	1538
Manual Way	1539
CodeBase Settings for Unsigned Assemblies	1540
Creating Publisher Policies.....	1540
Summary	1541

Table of Contents

Chapter 33: Developing Windows Mobile Applications.....	1543
In Depth.....	1544
Introduction to .NET Compact Framework	1544
New Features Introduced in .NET Compact Framework 3.5	1545
Immediate Solutions.....	1547
Creating a Simple Smart Device Application.....	1547
Developing a Database-Driven Smart Device Application.....	1550
Creating a Database.....	1550
Creating a Data Table.....	1555
Adding Data to the Data Table.....	1556
Displaying the Data of the Data Table in a DataGrid Control	1558
Summary	1561
Chapter 34: Security and Cryptography in .NET.....	1563
In Depth.....	1564
Code Verification and Security in .NET Framework	1564
Type-Safe and Verifiably Type-Safe MSIL Code	1565
Authentication and Authorization.....	1567
Role-Based Security	1568
Principal Object	1568
Identity Object.....	1569
Role-Based Security Checks	1570
Imperative Security Check	1571
Declarative Security Check	1572
Imperative Security Check versus Declarative Security Check	1574
Role-Based Security in ASP.NET Applications.....	1574
ASP.NET Security Architecture	1575
Authentication Modes	1576
Impersonation and Delegation.....	1586
Security through the ASP.NET Configuration File	1588
Code Access Security (CAS).....	1593
Security Policies	1593
Evidence	1594
Code Groups.....	1594
Permission Sets.....	1597
Viewing the Permission Set of Code	1598
Privileged Code and Security Demands in CAS	1599
Imperative Demands.....	1600
Declarative Demands	1601
Cryptography in .NET	1601
The System.Security.Cryptography Namespace	1602
Encryption and Decryption.....	1606
Secret-Key Encryption (Symmetric Encryption).....	1606
Public-Key Encryption (Asymmetric Encryption)	1610
Hash Algorithms.....	1615
MD5 Algorithm	1616
RIPEMD-160 Algorithm	1616
SHA Algorithms	1616
Immediate Solutions.....	1619
Determining Whether Code is Verifiably Type Safe.....	1619
Using Role-Based Security to Authenticate and Authorize Users.....	1621
Performing Role-Based Security Checks.....	1627
Using Anonymous Authentication in ASP.NET	1631
Using Windows Authentication in ASP.NET	1633
Using Forms Authentication in ASP.NET	1641
Using Impersonation in ASP.NET Applications	1645
Modifying Existing Code Groups	1649
Creating Code Groups	1652

Table of Contents

Creating Permission Sets	1658
Calculating the Permission Grant of Code	1660
Calculation of Permissions at a Policy Level by Code Group Traversal	1660
Intersection of Permissions at all the Policy Levels.....	1661
Specifying Permission Requirements in the Code.....	1661
Understanding Stack Walk.....	1663
Modifying Stack Walk.....	1667
Avoiding Stack Walk with Link Demands	1668
Partially Trusted Assemblies	1669
Allowing Partial Trust Callers.....	1669
Security Caveats	1670
Understanding Sandboxing	1671
Extracting Public Key out of a Strong Named Assembly	1672
Using Secret-Key Encryption.....	1672
Using Public-Key Encryption	1678
Using Hash Algorithms	1681
Summary	1685
Chapter 35: .NET Remoting in Visual Basic 2008	1687
In Depth.....	1688
.NET Remoting Architecture.....	1688
Concepts of AppDomains	1689
Remotable and Non-Remotable Objects	1691
Non-remotable Objects	1691
Remotable Objects	1691
The RemotingConfiguration Class	1693
Channels.....	1694
TCP Channel.....	1696
HTTP Channel.....	1697
IPC Channel.....	1698
Message Sinks.....	1699
Formatters	1699
BinaryFormatter.....	1699
SOAPFormatter.....	1701
Proxies in Remoting	1703
Transparent Proxies	1703
Real Proxies	1703
Hosting of Objects.....	1704
Managed Executable or Windows Service	1704
Internet Information Services	1704
.NET Component Services.....	1705
Comparison Between .NET Remoting, DCOM, and Web Services.....	1705
Object Lifetimes.....	1706
Immediate Solutions.....	1707
Creating and Using Application Domains	1707
Using Objects Created in the Additional App Domains	1708
Creating a Simple Remotable Object	1709
Creating a Host Application	1710
Enumerating Registered Channels	1712
Unregistering a Channel.....	1713
Registering Objects	1713
Specifying the Formatters.....	1713
Setting the Trust Level	1714
Creating a SingleCall Client Object.....	1715
Creating a SingleTon Client Object.....	1716
Creating a Client Activated Object.....	1722
Summary	1726

Table of Contents

Chapter 36: Human Resource Management System	1727
Introduction	1728
Flow Diagram	1728
SDLC of the Human Resource Management System	1729
Requirement Analysis.....	1730
Software Design.....	1730
The Login Module	1731
The Employee Details Module	1731
The Payroll Module.....	1731
The Attendance Management Module.....	1731
The Leave Management Module	1731
The Upcoming Events Module.....	1731
The Login Module	1731
The Leave Request Module.....	1731
The Leave Details Module.....	1731
The Salary Details Module.....	1731
The Attendance Details Module.....	1731
Database Design.....	1731
Development	1734
Testing	1734
Implementation and Maintenance	1734
Index	1735
What's on the CD-ROM.....	1747