

Developing Applications Using Visual C# 2008: Volume 1

Table of Contents

INTRODUCTION	INTRO-1
Prerequisites	INTRO-2
Installing the Practice Files	INTRO-3
Software Requirements	INTRO-3
Sample Database	INTRO-3
Security	INTRO-4
Installation	INTRO-5
About the Authors	INTRO-6
INTRODUCTION TO WINDOWS FORMS	1-1
.NET Does Windows	1-2
Adding Controls to a Form	1-8
Investigating Snap Lines	1-9
Adjusting Control Sizes and Positions	1-10
Controlling Tab Order	1-12
A Peek behind the Scenes	1-14
Viewing the Code	1-14
Adding Event Handling Code	1-20
Adding a Menu to the Form	1-22
Adding Non-Graphical Components	1-28
The ToolTip Component	1-28
The Timer Component	1-30
LAB 1: INTRODUCTION TO WINDOWS FORMS	1-37
Lab 1 Overview	1-38
Create a Windows Application	1-39
Anchor the Controls	1-43
Add Event-Handling Code	1-45
TAKING ADVANTAGE OF THE FORM EVENT MODEL	2-1
How Visual C# Handles Events	2-2
Working with Forms	2-7
Peeking under the Event “Covers”	2-14
Exploring Form and Control Events	2-28
Form Events	2-28

Table of Contents

Keyboard Events.....	2-31
Mouse Events	2-37
Control Events	2-41
Validating User Input.....	2-41
 LAB 2: TAKING ADVANTAGE OF THE FORM EVENT MODEL.....	2-51
Lab 2 Overview.....	2-52
Creating an Event Handler Using Visual Studio	2-53
Creating a Dynamic Event Handler	2-55
 COMMON WINDOWS FORMS CONTROLS.....	3-1
Windows Forms Controls.....	3-2
Label Control.....	3-3
TextBox Control	3-8
Button Control.....	3-16
CheckBox Control	3-20
RadioButton Control.....	3-22
ComboBox Control.....	3-26
ListBox Control.....	3-29
CheckedListBox Control	3-30
LinkLabel Control	3-33
NumericUpDown Control	3-35
PictureBox Control.....	3-37
ProgressBar Control	3-38
 LAB 3: COMMON WINDOWS FORMS CONTROLS.....	3-45
Lab 3 Overview.....	3-46
Create a Simple Data Entry Form.....	3-47
Modify the Data Entry Form.....	3-53
Add Validation to the Data Entry Form	3-58
 EXCEPTION HANDLING	4-1
Perspectives on Exception Handling	4-2
Exception Handling in .NET	4-2
The Demonstration Code.....	4-4
Getting Started with Exception Handling	4-5
No Error Handling	4-5
Adding a Simple Try/Catch Block	4-8
Unhandled Exceptions	4-10
Using an Exception Object.....	4-11
Catching Specific Exceptions	4-14

Taking Advantage of the Exception Hierarchy	4-17
Raising Errors	4-19
Using the Throw Keyword	4-19
Exception-Handling Options	4-20
Passing Error Information	4-21
Running Code Unconditionally	4-24
The Finally Block.....	4-24
Cleaning Up: The <i>Using</i> Statement	4-25
Handling Unhandled Exceptions.....	4-27
Creating Exception Classes.....	4-30
LAB 4: EXCEPTION HANDLING	4-37
Lab 4 Overview.....	4-38
Add Simple Exception Handling	4-40
Handle Individual Exceptions.....	4-42
Add Code Running Unconditionally	4-45
WORKING WITH STRINGS AND DATES	5-1
Basic .NET Data Types	5-2
Working with Text: The String Class.....	5-3
Investigating the String Class	5-3
Creating Strings	5-4
String Properties	5-5
Static String Methods	5-6
Instance String Methods	5-11
Manipulating Text with the StringBuilder Class.....	5-14
Working with Dates and Times	5-19
DateTime Constructors	5-20
Static Members	5-22
Simple Properties.....	5-23
Conversion Methods	5-23
Calculation Methods	5-25
Static Methods	5-26
Using the DateTime Type	5-27
Handling Elapsed Times with the TimeSpan Type	5-32
Measuring Elapsed Time	5-37
LAB 5: WORKING WITH STRINGS AND DATES	5-43
Lab 5 Overview.....	5-44

Table of Contents

Work with Strings.....	5-45
Work with the StringBuilder Class	5-50
Use StopWatch and TimeSpan to Measure Elapsed Time	5-54
 ACCESSIONG DATA.....	6-1
Overview of ADO.NET	6-2
ADO.NET Classes	6-2
The ADO.NET Architecture.....	6-3
Creating ADO.NET Data Objects.....	6-4
Connecting to Data.....	6-9
Setting Up Connection Information	6-9
Creating Connection Strings in the Configuration File	6-12
Using the Connection Object	6-14
Executing Commands.....	6-17
Working with Data Readers	6-17
Using the SQLDataReader	6-18
Working with Data.....	6-23
Working with Data Using a Data Adapter	6-23
Managing Data with the DataSet Object.....	6-23
Filling a DataTable within a DataSet.....	6-25
Filling a DataTable from SQL Server	6-29
Choosing an ADO.NET Provider	6-33
The SQL Server .NET Data Provider.....	6-33
The OLE DB .NET Data Provider	6-34
The ODBC Data Provider	6-34
Writing Code for Multiple Providers	6-35
 LAB 6: ACCESSIONG DATA.....	6-45
Lab 6 Overview.....	6-46
Create a Connection String in the Configuration File	6-47
Use the DataReader to Fill a ListBox with Categories.....	6-49
Use a DataSet to Fill a DataGridView with Products	6-53
 INTRODUCING LINQ.....	7-1
Language Integrated Query.....	7-2
LINQ Using Visual Basic and C#	7-4
LINQ Syntax	7-7
Basic LINQ Syntax.....	7-7
Extension Methods	7-9
LINQ and More Complex Objects	7-11

Anonymous Types	7-17
Some Interesting Examples	7-19
LINQ to SQL	7-26
Creating a Data Model	7-26
Calling Stored Procedures	7-33
Using Anonymous Types with SQL	7-34
Modifying SQL Data.....	7-35
LINQ to DataSets.....	7-41
LINQ to Typed DataSets.....	7-41
LINQ to Untyped DataSets	7-44
LINQ to XML.....	7-47
Generating XML.....	7-47
Querying XML	7-50
Transforming XML	7-54
Are You Done? Is there More?	7-56
LAB 7: INTRODUCING LINQ	7-61
Lab 7 Overview.....	7-62
Use LINQ to Objects.....	7-63
Use LINQ to SQL.....	7-66
Use LINQ to XML.....	7-71
DATA BINDING TECHNIQUES	8-1
Data Binding Basics.....	8-2
Creating a Data Source	8-3
The Data Sources Window	8-8
Creating Data Bound Forms	8-10
Data Binding Components and Controls	8-15
The DataSet.....	8-15
The TableAdapter	8-18
The TableAdapterManager	8-20
The BindingSource Component.....	8-21
The BindingNavigator Control.....	8-23
Displaying Data from Related Tables	8-25
Enforcing Referential Integrity	8-30
Displaying Data from Lookup Tables.....	8-39
Adding Search Capabilities to a Form	8-42
Filtering by Values from a Lookup Table	8-49

Table of Contents

Validating Data	8-55
Determining Whether the User Made Changes	8-55
Validating Data at the Form Level.....	8-57
Validating Data at the Data Level	8-62
Working with Local Data	8-68
LAB 8: DATA BINDING TECHNIQUES.....	8-75
Lab 8 Overview.....	8-76
Create a Simple Data Bound Form.....	8-77
Search and Filter Based on Criteria.....	8-87
Validate Data	8-96
USING THE DATA CONTROLS	9-1
Data Controls.....	9-2
The BindingNavigator Control.....	9-3
BindingNavigator ToolStripItems	9-4
Built-In and Custom Functionality	9-5
Adding a BindingNavigator Control to a Form	9-6
The BindingSource Component.....	9-7
Data Navigation	9-8
Data Manipulation	9-9
Sorting and Filtering.....	9-11
Working with the Underlying Data.....	9-12
The DataGridView Control.....	9-17
Customizing How Data is Displayed.....	9-17
Formatting Cells at Runtime	9-22
Displaying Calculated Values	9-24
Displaying Images.....	9-26
Adding Controls to a DataGridView	9-29
The ReportViewer Control	9-32
Creating and Viewing Reports	9-32
LAB 9: USING THE DATA CONTROLS.....	9-49
Lab 9 Overview.....	9-50
Navigate and Manipulate Data with the BindingSource Component	9-51
Format the DataGridView Control.....	9-58
Display Reports with the ReportViewer Control.....	9-66
GETTING STARTED WITH WPF.....	10-1

Introducing Windows Presentation Foundation (WPF).....	10-2
Graphics and Composition.....	10-4
Important Questions.....	10-5
Investigating a Reference Application.....	10-6
An Inconvenient Truth (or Two)	10-7
WPF and XAML	10-8
Investigating XAML and the WPF Designer	10-9
Your First WPF Application.....	10-9
Investigating Routed Events	10-19
Introducing Content and Grid Controls	10-23
Working with Content Controls	10-23
List Box as Container.....	10-31
Working with the Grid Control.....	10-34
Placing Controls onto the Grid.....	10-41
LAB 10: GETTING STARTED WITH WPF.....	10-53
Lab 10 Overview.....	10-54
Create the User Interface	10-56
Add Puzzle Behavior	10-60
Shuffle the Puzzle.....	10-64
REVISITING WPF	11-1
Lay Out the Application.....	11-2
Create the Layout	11-5
Lay Out the Form	11-6
Create the MoviePlayer Control.....	11-14
Create the User Control	11-14
Add Code to the User Control.....	11-22
Create a Data Source and Hook Up Data Binding	11-35
Create the ThumbnailList Class.....	11-35
Prepare the Window1 Class	11-37
Hook up the Data Binding	11-39
Display the Video	11-41
Add a Data Converter and a Data Template	11-43
Creating a Type Converter.....	11-43
LAB 11: REVISITING WPF	11-53
Lab 11 Overview.....	11-54
Create the Main Form.....	11-56

Create a User Control.....	11-61
Hook Up Data Binding and a Data Template.....	11-65
 HANDLING INPUT/OUTPUT TASKS.....	12-1
Introducing the System.IO Namespace	12-2
Selecting Files	12-4
Browsing for Folders.....	12-12
Handling Path Information	12-16
Working with Directories and Files	12-20
Retrieving Information about Drives.....	12-22
Investigating the Objects.....	12-24
Calling Methods of the Directory Class.....	12-27
Filling the TreeView	12-29
Displaying Drive, File, and Directory Information.....	12-33
Using Stream-Based Objects to Read and Write File Contents	12-38
Reading and Writing Text Files.....	12-38
Investigating the Code	12-40
Alternate Solutions.....	12-44
Writing to Files Using the StreamWriter.....	12-45
 LAB 12: HANDLING INPUT/OUTPUT TASKS.....	12-51
Lab 12 Overview.....	12-52
Browse for Files	12-53
Display Selected File Information	12-55
Load File Contents.....	12-57
 PROJECT SETTINGS IN VISUAL STUDIO 2008.....	13-1
The Project Designer	13-2
Application Properties	13-4
Assembly Name.....	13-4
Default Namespace	13-5
Target Framework.....	13-5
Icon	13-6
Startup Object.....	13-6
Assembly Information	13-7
Compilation Properties	13-10
Conditional Compilation	13-12
Compiler Errors and Warnings.....	13-13
Build Events	13-15

Debugging Properties	13-17
Start Action	13-17
Start Options	13-18
Enable Debuggers	13-19
Project References	13-20
Adding Project References	13-21
Project Resources	13-24
Project Resources and Local Resources	13-26
Project Settings.....	13-34
LAB 13: PROJECT SETTINGS IN VISUAL STUDIO 2008	13-41
Lab 13 Overview.....	13-42
Control Application Behavior and Appearance	13-43
Build the Project.....	13-46
Manage Project Resources and Settings	13-51
DEBUGGING YOUR APPLICATIONS	14-1
Debugging Applications	14-2
Setting Breakpoints and Stepping through Code.....	14-3
Setting a Breakpoint.....	14-3
Continuing Program Execution	14-5
Setting Conditional Breakpoints.....	14-5
Specifying a Breakpoint Hit Count	14-7
Setting a Breakpoint on a Method.....	14-7
Using the Breakpoints Window	14-9
Breaking on Exceptions	14-10
Evaluating Variables and Objects	14-12
Viewing DataTips and Visualizers.....	14-12
Using the Watch Window and QuickWatch Dialog Box	14-15
Using the Locals Window.....	14-17
Using the Autos Window	14-19
Using the Immediate Window	14-19
Using the Edit and Continue Feature.....	14-21
Debugging Code in Assemblies.....	14-25
Stepping into Code in an Assembly	14-25
Stepping into Code Written in Another Language.....	14-27
Tracing and Instrumenting Applications.....	14-28
Trace Sources.....	14-29
Trace Switches	14-32

Trace Listeners	14-33
Trace Filtering	14-36
Using Configuration Files to Control Tracing	14-38
Testing Code with Unit Tests.....	14-41
LAB 14: DEBUGGING YOUR APPLICATIONS	14-53
Lab 14 Overview.....	14-54
Set Breakpoints and Step Through Code	14-55
Evaluate Expressions and Use Edit and Continue	14-60
Trace Applications	14-68
CONTAINER CONTROLS	15-1
Introducing Container Controls	15-2
Working with Container Controls	15-3
Creating the Switchboard Form	15-3
Grouping Controls with the GroupBox Control	15-7
GroupBox Control Members	15-7
BackgroundImage and BackColor Properties.....	15-11
Visible, Enabled, and Font Properties.....	15-12
Introducing the Panel Control	15-14
BorderStyle Property.....	15-14
Scrolling Features	15-15
Displaying Multiple Panels with the SplitContainer Control	15-17
Orientation Property.....	15-18
IsSplitterFixed Property.....	15-19
SplitterWidth Property	15-19
SplitterDistance Property	15-20
FixedPanel Property	15-20
Panel1MinSize and Panel2MinSize Properties.....	15-21
Panel1Collapsed and Panel2Collapsed Properties	15-21
SplitContainer Control Events.....	15-22
Laying out Panels with the TabControl Control	15-25
Working with Tab Pages	15-27
Alignment Property	15-28
Appearance Property	15-29
MultiLine Property	15-30
SizeMode Property	15-31
ShowToolTips Property.....	15-32
Informational Properties	15-34
Adding Tab Pages	15-34

TabControl Events	15-35
Simple Layout Using the FlowLayoutPanel Control.....	15-37
Working with the FlowLayoutPanel Control	15-39
FlowLayoutPanel Control Properties	15-44
Advanced Layout Using the TableLayoutPanel Control	15-48
Getting Started with the TableLayoutPanel Control.....	15-48
Setting Row and Column Styles	15-50
Positioning New Controls.....	15-53
Adding Controls Programmatically.....	15-54
Working with Other Properties	15-56
Laying out the Columns or Rows	15-57
TableLayoutPanel Control Extender Properties.....	15-61
TableLayoutPanel Control Methods.....	15-64
 LAB 15: CONTAINER CONTROLS.....	15-71
Lab 15 Overview.....	15-72
Lay Out a Panel Control	15-73
Use the SplitContainer Control	15-77
Work with the TableLayoutPanel Control	15-80
 MENUS AND TOOLBARS	16-1
Introducing the 'Strips	16-2
Adding Menu Images	16-5
Using Visual Studio's Automatic Menus	16-8
The ToolStrip Control.....	16-9
The StatusStrip Control.....	16-12
The ContextMenuStrip Control	16-17
The ToolStripContainer Control	16-18
Working with a ToolStripItem	16-21
ToolStripItem Display Styles	16-23
Making and Saving Runtime Customizations	16-25
ToolStrip Layout Issues and Overflow	16-30
Working with the 'Strips	16-34
RichTextBox Demo	16-34
WebBrowser Demo.....	16-39
 LAB 16: MENUS AND TOOLBARS.....	16-47
Lab 16 Overview.....	16-48
Add the ToolStrip	16-49
Add the ToolStrip	16-52

Table of Contents

Add the StatusStrip.....	16-55
COMPLEX WINDOWS FORMS CONTROLS.....17-1	
Introducing Complex Controls	17-2
NotifyIcon Control	17-3
Investigating the Sample Form	17-5
WebBrowser Control.....	17-10
Investigating the Sample Form	17-12
Investigating WebBrowser Navigation	17-14
Displaying Dialog Boxes	17-16
Reacting to Environment Changes	17-17
In Summary.....	17-21
MaskedTextBox Control	17-22
Operation of the MaskedTextBox Control	17-23
Reacting to the MaskInputRejected Event.....	17-28
Status Properties	17-29
In Summary.....	17-30
RichTextBox Control.....	17-31
Handling State	17-32
Undo and Redo.....	17-36
Working with the Clipboard	17-39
Working with Fonts and Styles.....	17-40
Formatting Text.....	17-45
Working with Zoom, Links, and More.....	17-49
TreeView and ListView Controls.....	17-51
TreeView Control	17-53
ListView Control	17-63
Setting Up the Images	17-67
Filling the List of Files	17-68
Working with ListView Items	17-71
Showing Items in Groups.....	17-73
Sorting the Columns	17-77
MonthCalendar and DateTimePicker Controls	17-85
The MonthCalendar Control.....	17-86
The DateTimePicker Control.....	17-93
In Summary.....	17-97
LAB 17: COMPLEX WINDOWS FORMS CONTROLS	17-101
Lab 17 Overview.....	17-102
Set Up the NotifyIcon Control	17-103

Add the DateTimePicker Control	17-107
Add a Web Browser.....	17-110
APPENDIX A: WORKING WITH THE MY NAMESPACE	A-1
The My Namespace.....	A-3
My.Application	A-4
My.Application.Info.....	A-7
My.Application.Log.....	A-9
My.Computer	A-12
My.Computer.Screen	A-12
My.Computer.Audio	A-14
My.Computer.Clipboard	A-16
My.Computer.Clock	A-17
My.Computer.FileSystem.....	A-18
My.Computer.Info	A-21
My.Computer.Keyboard	A-23
My.Computer.Network	A-24
My.Computer.Registry	A-25
My.User	A-28
My.Forms.....	A-29
My.Resources.....	A-30
My.Settings	A-32
My.WebServices	A-34
LAB A: WORKING WITH THE MY NAMESPACE	A-41
Lab A Overview	A-42
Work with the File System	A-43
Use the My.Application Object.....	A-50
Use the My.User and My.Computer Objects	A-53
INDEX.....	INDEX-1

Table of Contents
