

Learning to Program in Visual C# 2005

Table of Contents

INTRODUCTION	INTRO-1
Prerequisites	INTRO-2
Installing the Practice Files	INTRO-3
Software Requirements	INTRO-3
Installation	INTRO-3
Demonstration Applications	INTRO-3
About the Authors	INTRO-4
GETTING STARTED WITH .NET	1-1
Thinking about .NET	1-2
What Is .NET?	1-2
Why .NET?	1-3
Advantages of .NET	1-3
.NET Architecture	1-4
Examining a .NET Application: Introducing Assemblies	1-8
What Kinds of Programs Can You Create?	1-9
Using the Command-Line Compiler to Build a Console Application	1-9
Revisiting Microsoft Intermediate Language	1-15
Using Visual Studio 2005	1-18
Working with Your Visual Studio Profile Settings	1-18
Revisiting the .NET Console Application	1-26
Debugging and Handling Exceptions	1-42
Handling Errors	1-52
Fixing the Logic Error	1-55
LAB 1: GETTING STARTED WITH .NET	1-61
Lab 1 Overview	1-62
Customize the Visual Studio Environment	1-63
Create a Console Application	1-69
Use Visual Studio Debugging	1-73
DATA TYPES AND VARIABLES	2-1
Introducing Variables and Data Types	2-2
Variables	2-2
Data Types	2-7

Integer Data Types	2-10
Floating-Point Data Types	2-13
Decimal Data Type	2-13
Char Data Type.....	2-17
String Data Type	2-20
Bool Data Type	2-22
Object Data Type	2-23
Constants, Enumerations, and Structures	2-24
Working with Variables and Data Types.....	2-29
Converting from One Data Type to Another	2-29
Operators	2-39
LAB 2: DATA TYPES AND VARIABLES.....	2-55
Lab 2 Overview.....	2-56
Calculate a Loan Payment.....	2-57
Compare Gasoline Costs of Cars	2-60
Create a Menu	2-66
USING THE .NET FRAMEWORK.....	3-1
Using .NET Framework Classes.....	3-2
Generating Random Numbers	3-4
Getting Information about the Computer.....	3-6
Working with XML	3-8
File Input/Output	3-13
Working with Strings	3-20
Fields and Properties of the String Class.....	3-20
Methods of the String Class.....	3-22
Formatting Strings.....	3-30
Using the StringBuilder Class	3-35
Working with Dates and Times	3-39
Properties of the DateTime Structure	3-39
Methods of the DateTime Structure	3-42
Using the TimeSpan Structure.....	3-44
LAB 3: USING THE .NET FRAMEWORK	3-53
Lab 3 Overview.....	3-54
Work with Dates and Times.....	3-55
Write and Read XML	3-59
Work with Strings.....	3-65
Create a Menu	3-72

BRANCHING AND FLOW CONTROL	4-1
Branching in Code	4-2
Conditional Branching.....	4-2
Repeating Code Blocks	4-11
Unbounded Looping.....	4-11
Looping a Specific Number of Times	4-14
The foreach Loop.....	4-20
Unconditional Branching.....	4-22
The break Statement	4-22
The Goto Statement.....	4-22
The Continue Statement.....	4-25
LAB 4: BRANCHING AND FLOW CONTROL.....	4-31
Lab 4 Overview.....	4-32
Use a For Loop to List All the Windows Services	4-33
Use a For Each Loop to List All the Windows Services.....	4-38
Display Service Status Information.....	4-40
CLASSES AND OBJECTS.....	5-1
Introducing Objects and Classes.....	5-2
Revisiting .NET Framework Classes	5-2
Using Class Properties	5-8
Calling Class Methods	5-9
Creating Your Own Classes	5-12
Creating Your First Class.....	5-13
Adding XML Comments	5-17
Using the Class View Window	5-20
Using the Class Designer	5-21
Investigating the Code	5-31
Adding the Code	5-34
Add Another Method and Test the Class	5-36
Working with the Object Test Bench.....	5-40
Working with Classes	5-44
Value Types vs. Reference Types.....	5-44
Setting Reference Variables to Null and Disposing	5-46
Providing for Deterministic Finalization.....	5-50
Overriding Object Class Functionality.....	5-55
Manipulating Object References.....	5-57
Instance vs. Static Members.....	5-60
Thinking More about Static Members	5-63

LAB 5: CLASSES AND OBJECTS	5-67
Lab 5 Overview	5-68
Create the LogFile Class	5-69
Modify the LogFile Class Using the Class Designer	5-72
PROPERTIES AND METHODS	6-1
Overview of Properties and Methods	6-2
Properties	6-3
Calculating Values for Properties	6-4
Validating Values in Properties	6-6
Methods	6-9
Passing Arguments to Methods	6-10
Methods in Classes	6-14
Class Constructors	6-15
Saving and Retrieving Information	6-18
Returning and Passing Arrays	6-26
Instance and Static Members	6-31
LAB 6: PROPERTIES AND METHODS	6-39
Lab 6 Overview	6-40
Create the Order Class	6-41
Validate and Calculate Property Values	6-48
Save and Retrieve Orders	6-54
OBJECT-ORIENTED TECHNIQUES	7-1
Inheritance	7-2
Derived Classes	7-4
Abstract Classes and Members	7-15
Sealed Classes and Members	7-19
Interfaces	7-22
Implementing an Interface	7-24
Interfaces in the .NET Framework	7-27
Organizing Classes	7-30
Partial Classes	7-30
Nested Classes	7-31
Namespaces	7-35
LAB 7: OBJECT-ORIENTED TECHNIQUES	7-43
Lab 7 Overview	7-44
Derived Classes	7-45

Overriding and Overloading Members.....	7-54
Implement an Interface	7-59
WORKING WITH ARRAYS	8-1
Introducing Arrays.....	8-2
Creating and Filling Arrays.....	8-6
Initializing Arrays.....	8-11
Retrieving Data from Arrays.....	8-13
Arrays and Method Parameters	8-15
Arrays in the .NET Framework.....	8-17
Manipulating Arrays	8-18
Sorting Arrays	8-19
Allowing for More Flexible Sorting	8-23
Searching in Arrays.....	8-34
Creating Indexers	8-40
Adding an Enumerator	8-47
LAB 8: WORKING WITH ARRAYS	8-53
Lab 8 Overview.....	8-54
Fill and Display an Array with Windows Services	8-55
Sort the Array of Services.....	8-61
Display a Subset of Services	8-66
DELEGATES AND EVENTS	9-1
Motivating Delegates	9-2
Testing the FileSearch0 Class.....	9-7
FileSearch1: Modifying the FileSearch0 Class	9-8
FileSearch1a: Inheritance is a Possible Solution.....	9-10
Using an Event Interface Class.....	9-12
Introducing Delegates.....	9-18
Digging Deeper into Delegates	9-23
Named vs. Anonymous Delegates.....	9-24
Delegate vs. MulticastDelegate	9-28
Working with Events	9-30
Declaring and Raising Events.....	9-30
Multiple Event Handlers	9-33
Exceptions and Multiple Event Handlers	9-34
Manually Invoking Each Listener	9-36
Using the .NET Event Design Pattern.....	9-39

LAB 9: DELEGATES AND EVENTS	9-47
Lab 9 Overview	9-48
Use a .NET Delegate	9-50
Add a Visual Basic 6-Style Event	9-53
Add a .NET-Style Event	9-55
GENERICs	10-1
Introducing Generics	10-2
Generic Methods	10-5
Generic Classes	10-8
Advantages of Generics	10-11
Generics and Arrays	10-12
Sorting Arrays	10-12
Sorting with the IComparer Interface	10-14
Sorting with Generic Comparisons	10-17
Searching with Generic Predicates	10-21
Generic Interfaces	10-26
Generic Constraints	10-30
Generics and Lists	10-35
Using an ArrayList to Store a Collection of Items	10-35
Using a Generic List to Store a Collection of Items	10-38
Sorting with the List Class	10-39
LAB 10: GENERICs	10-45
Lab 10 Overview	10-46
Sorting and Searching Arrays with Generics	10-47
Using Generic Interfaces and Constraints	10-56
Managing Collections with Generic Lists	10-63
HANDLING EXCEPTIONS	11-1
Perspectives on Exception Handling	11-2
Exception Handling in .NET	11-2
The Demonstration Code	11-4
Getting Started with Exception Handling	11-5
No Error Handling	11-5
Adding a Simple Try/Catch Block	11-8
Unhandled Exceptions	11-10
Using an Exception Object	11-11
Catching Specific Exceptions	11-14

Understanding the Exception Hierarchy	11-18
Raising Errors	11-20
Using the Throw Keyword.....	11-20
Exception-Handling Options	11-21
Passing Error Information	11-21
Running Code Unconditionally	11-25
The Finally Block.....	11-25
Cleaning Up: The <i>Using</i> Statement	11-27
Creating Exception Classes.....	11-30
LAB 11: HANDLING EXCEPTIONS	11-37
Lab 11 Overview	11-38
Add Simple Exception Handling	11-39
Handle Individual Exceptions.....	11-44
Run Code Unconditionally	11-51
COLLECTION CLASSES	12-1
Generics, Collections, and Interfaces	12-2
Introducing the Generic Collection Interfaces	12-3
The Generic List	12-7
Working with the List Class.....	12-8
Working with Predicates	12-42
Working with Dictionaries, Stacks, and Queues	12-54
Storing Key/Value Pairs Using a Dictionary	12-55
Using the SortedDictionary and SortedList Classes	12-62
Using Queues and Stacks	12-70
Creating Your Own Generic Collection Classes	12-77
Sample Scenario.....	12-78
Creating the Custom Collection Class	12-79
Consuming the Custom Collection.....	12-84
LAB 12: COLLECTION CLASSES	12-91
Lab 12 Overview	12-92
Create and Fill SortedDictionary.....	12-94
Add List with File Information.....	12-99
Sort the FileInfo List.....	12-101
INDEX.....	INDEX-1

