

Learning to Program Using Visual Basic 2010

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.....	1-4
.NET Architecture.....	1-5
Examining a .NET Application: Introducing Assemblies.....	1-9
What Kinds of Programs Can You Create?.....	1-10
Using the Command-Line Compiler to Build a Console Application.....	1-10
Revisiting Microsoft Intermediate Language.....	1-16
Using Visual Studio 2010.....	1-19
Working with Your Visual Studio Profile Settings.....	1-19
Revisiting the .NET Console Application.....	1-28
Debugging and Handling Exceptions.....	1-45
Handling Errors.....	1-55
Fixing the Logic Error.....	1-57
LAB 1: GETTING STARTED WITH .NET.....	1-63
Lab 1 Overview.....	1-64
Customize the Visual Studio Environment.....	1-65
Create a Console Application.....	1-70
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	2-9
Floating-Point Data Types	2-12
Decimal Data Type	2-12
Char Data Type.....	2-17
String Data Type	2-21
Boolean Data Type	2-21
Date Data Type.....	2-22
Object Data Type	2-23
Constants, Enumerations, and Structures	2-24
Working with Variables and Data Types.....	2-30
Converting from One Data Type to Another	2-30
Operators	2-43
LAB 2: DATA TYPES AND VARIABLES.....	2-63
Lab 2 Overview.....	2-64
Calculate a Loan Payment.....	2-65
Compare Gasoline Costs of Cars	2-68
Create a Menu	2-75
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	3-19
Fields and Properties of the String Class.....	3-19
Methods of the String Class.....	3-21
Formatting Strings.....	3-29
Using the StringBuilder Class	3-34
Working with Dates and Times	3-38
Properties of the DateTime Structure	3-38
Methods of the DateTime Structure	3-41
Using the TimeSpan Structure.....	3-44
The My Namespace.....	3-49
My.Application.....	3-49
My.Computer	3-51
My.User.....	3-56

LAB 3: USING THE .NET FRAMEWORK	3-62
Lab 3 Overview	3-63
Work with Dates and Times	3-64
Write and Read XML	3-68
Work with Strings	3-74
Create a Menu	3-80
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	4-15
The For Loop	4-20
Unconditional Branching	4-22
Exit For/Exit While/Exit Do	4-22
The Goto Statement	4-23
The Continue Statement	4-25
LAB 4: BRANCHING AND FLOW CONTROL.....	4-33
Lab 4 Overview	4-34
Use a For Loop to List All the Windows Services	4-35
Use a For Each Loop to List All the Windows Services	4-39
Display Service Status Information.....	4-41
CLASSES AND OBJECTS.....	5-1
Introducing Classes and Objects	5-2
Revisiting .NET Framework Classes	5-2
Using Class Properties	5-9
Calling Class Methods	5-10
Creating Your Own Classes	5-13
Creating Your First Class.....	5-14
Adding XML Comments	5-18
Using the Class View Window	5-22
Using the Class Designer	5-23
Investigating the Code	5-32
Adding the Code	5-35
Add Another Method and Test the Class	5-39
Working with Classes	5-43

Value Types vs. Reference Types	5-43
Setting Reference Variables to Nothing and Disposing	5-45
Providing for Deterministic Finalization	5-49
Overriding Object Class Functionality	5-54
Manipulating Object References	5-56
Instance vs. Shared Members	5-59
Thinking More about Shared Members.....	5-62
LAB 5: CLASSES AND OBJECTS	5-69
Lab 5 Overview	5-70
Create the LogFile Class	5-71
Modify the LogFile Class Using the Class Designer	5-75
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	6-7
Passing Arguments to Properties	6-9
Methods	6-13
Passing Arguments to Methods	6-14
Methods in Classes.....	6-17
Class Constructors.....	6-18
Saving and Retrieving Information.....	6-21
Returning and Passing Arrays	6-30
Optional Parameters	6-34
Named Parameters.....	6-37
Instance and Static Members	6-38
LAB 6: PROPERTIES AND METHODS.....	6-47
Lab 6 Overview.....	6-48
Create the Order Class.....	6-49
Validate and Calculate Property Values	6-57
Save and Retrieve Orders	6-64
OBJECT-ORIENTED TECHNIQUES	7-1
Inheritance	7-2
Derived Classes.....	7-5
Abstract Classes and Members	7-15
Sealed Classes and Members	7-20

Interfaces	7-23
Implementing an Interface	7-24
Interfaces in the .NET Framework	7-25
Organizing Classes.....	7-29
Partial Classes	7-29
Nested Classes.....	7-30
Namespaces	7-34
LAB 7: OBJECT-ORIENTED TECHNIQUES	7-43
Lab 7 Overview.....	7-44
Derived Classes.....	7-45
Overriding and Overloading Members.....	7-55
Implement an Interface	7-60
WORKING WITH ARRAYS	8-1
Introducing Arrays.....	8-2
Creating and Filling Arrays.....	8-6
Initializing Arrays.....	8-12
Retrieving Data from Arrays.....	8-14
Arrays and Method Parameters	8-16
Arrays in the .NET Framework.....	8-18
Manipulating Arrays	8-19
Sorting Arrays	8-20
Allowing for More Flexible Sorting	8-24
Searching in Arrays.....	8-35
LAB 8: WORKING WITH ARRAYS	8-45
Lab 8 Overview.....	8-46
Fill and Display an Array with Windows Services	8-47
Sort the Array of Services.....	8-52
Display a Subset of Services	8-56
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.....	9-9
Using an Event Interface Class.....	9-11
Introducing Delegates.....	9-17
Digging Deeper into Delegates	9-21

Delegate vs. MulticastDelegate	9-24
Working with Events	9-27
Doing Things the VB6 Way	9-28
Multiple Event Handlers	9-30
Exceptions and Multiple Event Handlers	9-33
Manually Invoking Each Listener	9-35
Using the .NET Event Design Pattern.....	9-39
Adding and Removing Handlers Dynamically	9-42
LAB 9: DELEGATES AND EVENTS	9-49
Lab 9 Overview	9-50
Use a .NET Delegate.....	9-52
Add a Visual Basic 6-Style Event	9-55
Add a .NET-Style Event.....	9-57
GENERICs.....	10-1
Introducing Generics.....	10-2
Generic Methods.....	10-5
Generic Classes.....	10-8
Advantages of Generics.....	10-11
Generics and Arrays	10-13
Sorting Arrays	10-13
Sorting with the IComparer Interface	10-15
Sorting with Generic Comparisons	10-19
Searching with Generic Predicates.....	10-23
Generic Interfaces	10-27
Generic Constraints	10-31
Generics and Lists	10-37
Using an ArrayList to Store a Collection of Items	10-37
Using a Generic List to Store a Collection of Items	10-40
Sorting with the List Class.....	10-41
LAB 10: GENERICs.....	10-47
Lab 10 Overview.....	10-48
Sorting and Searching Arrays with Generics	10-49
Using Generic Interfaces and Constraints	10-58
Managing Collections with Generic Lists	10-65
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	11-9
Using an Exception Object.....	11-10
Catching Specific Exceptions	11-14
Understanding the Exception Hierarchy	11-17
Ordering Catch Blocks	11-19
Raising Errors	11-21
Using the Throw Keyword.....	11-21
Exception Handling Options.....	11-22
Passing Error Information	11-22
Running Code Unconditionally	11-26
The Finally Block.....	11-26
Cleaning Up: The <i>Using</i> Statement	11-28
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	11-49
COLLECTION CLASSES	12-1
Generics, Collections, and Interfaces	12-2
Introducing the Generic Collection Interfaces	12-3
The Generic List	12-8
Working with the List Class.....	12-10
Working with Predicates	12-46
Working with Dictionaries, Stacks, and Queues	12-59
Storing Key/Value Pairs Using a Dictionary	12-60
Using the SortedDictionary and SortedList Classes	12-67
Using Queues and Stacks	12-75
Creating Your Own Generic Collection Classes	12-82
Sample Scenario.....	12-83
Creating the Custom Collection Class	12-84
Consuming the Custom Collection.....	12-88

LAB 12: COLLECTION CLASSES	12-96
Lab 12 Overview	12-97
Create and Fill SortedDictionary	12-99
Add List with File Information.....	12-103
Sort the FileInfo List.....	12-105
INTRODUCING LINQ.....	13-1
Language Integrated Query	13-2
Data Access, Historically	13-2
LINQ to the Rescue	13-4
LINQ Providers	13-5
Structure of a LINQ Query	13-8
The Three Stages of a LINQ Query	13-8
Returning Multiple Values	13-13
Deferred Execution	13-19
Some LINQ Examples	13-26
LINQ to Objects	13-26
LINQ to SQL	13-34
LINQ to XML	13-48
LAB 13: INTRODUCING LINQ	13-59
Lab 13 Overview	13-60
Use LINQ to Objects.....	13-61
Use LINQ to SQL.....	13-65
Use LINQ to XML.....	13-70
LANGUAGE EXTENSIONS FOR LINQ	14-1
LINQ and Languages.....	14-2
The Sample Application	14-2
Modifying the Sample	14-4
Implicitly Typed Local Variables and Object Initializers	14-7
Implicit Type Declarations.....	14-7
Object Initializers.....	14-9
Lambda Expressions, Extension Methods, and Anonymous Types... ..	14-14
Lambda Expressions	14-14
Extension Methods	14-24
Anonymous Types	14-29
LAB 14: LANGUAGE EXTENSIONS FOR LINQ.....	14-37
Lab 14 Overview	14-38

Add Implicit Type Declarations and Object Initializers	14-39
Add Lambda Expressions	14-44
INDEX.....	INDEX-1

