



## Module 1

# Review of Visual C# Syntax



# Module Overview

- Overview of Writing Application by Using Visual C#
- Data Types, Operators, and Expressions
- Visual C# Programming Language Constructs



# Lesson 1: Overview of Writing Application by Using Visual C#

- What Is the .NET Framework?
- Key Features of Visual Studio
- Templates in Visual Studio
- Creating a .NET Framework Application
- Overview of XAML



# What Is the .NET Framework?

- CLR
  - Robust and secure environment for your managed code
  - Memory management
  - Multithreading
- Class library
  - Foundation of common functionality
  - Extensible
- Development frameworks
  - WPF
  - Windows store
  - ASP.NET
  - WCF



# Key Features of Visual Studio 2012

- Intuitive IDE
- Rapid application development
- Server and data access
- IIS Express
- Debugging features
- Error handling
- Help and documentation



# Templates in Visual Studio 2012

- Console Application
- Windows Forms Application
- WPF Application
- Windows Store
- Class Library
- ASP.NET Web Application
- ASP.NET MVC 4 Application
- WCF Service Application



# Creating a .NET Framework Application

1. In Visual Studio, on the File menu, point to New, and then click Project.
2. In the New Project dialog box, choose a template, location, name, and then click OK.

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace ConsoleApplication1
{
    class Program
    {
        static void Main(string[] args) { }
    }
}
```



# Overview of XAML

- XML-based language for declaring UIs
- Uses elements to define controls
- Uses attributes to define properties of controls

```
<Label Content="Name:" HorizontalAlignment="Left"  
Margin="72,43,0,0" VerticalAlignment="Top" />
```

```
<TextBox HorizontalAlignment="Left" Height="23" Margin="141,43,0,0"  
Text="" VerticalAlignment="Top" Width="120" />
```

```
<Button Content="Click Me!" HorizontalAlignment="Left"  
Margin="119,84,0,0" VerticalAlignment="Top" Width="75" />
```





# Lesson 2: Data Types, Operators, and Expressions

- What are Data Types?
- Expressions and Operators in Visual C#
- Declaring and Assigning Variables
- Accessing Type Members
- Casting Between Data Types
- Manipulating Strings



# What are Data Types?

- int – whole numbers
- long – whole numbers (bigger range)
- float – floating-point numbers
- double - double precision
- decimal - monetary values
- char - single character
- bool - Boolean
- DateTime - moments in time
- string - sequence of characters



# Expressions and Operators in Visual C#

Example expressions:

- + operator

```
a + 1
```

- / operator

```
5 / 2
```

- + and – operators

```
a + b - 2
```

- + operator (string concatenation)

```
"ApplicationName: " + appName.ToString()
```



# Declaring and Assigning Variables

- Declaring variables:

```
int price;  
// OR  
int price, tax;
```

- Assigning variables:

```
price = 10;  
// OR  
int price = 10;
```

- Implicitly typed variables:

```
var price = 20;
```

- Instantiating object variables by using the new operator

```
ServiceConfiguration config = new ServiceConfiguration();
```



# Accessing Type Members

- Invoke instance members

```
<instanceName>.<memberName>
```

- Example:

```
var config = new ServiceConfiguration();

// Invoke the LoadConfiguration method.
config.LoadConfiguration();

// Get the value from the ApplicationName property.
var applicationName = config.ApplicationName;

// Set the .DatabaseServerName property.
config.DatabaseServerName = "78.45.81.23";

// Invoke the SaveConfiguration method.
config.SaveConfiguration();
```



# Casting Between Data Types

- Implicit conversion:

```
int a = 4;  
long b = 5;  
b = a;
```

- Explicit conversion:

```
int a = (int) b;
```

- System.Convert conversion:

```
string possibleInt = "1234";  
int count = Convert.ToInt32(possibleInt);
```



# Manipulating Strings

- Concatenating strings

```
StringBuilder address = new StringBuilder();  
address.Append("23");  
address.Append(", Main Street");  
address.Append(", Buffalo");  
string concatenatedAddress = address.ToString();
```

- Validating strings

```
var textToTest = "hell0 w0rld";  
var regularExpression = "\\d";  
  
var result = Regex.IsMatch(textToTest, regularExpression,  
    RegexOptions.None);  
  
if (result)  
{  
    // Text matched expression.  
}
```



# Lesson 3: Visual C# Programming Language Constructs

- Implementing Conditional Logic
- Implementing Iteration Logic
- Creating and Using Arrays
- Referencing Namespaces
- Using Breakpoints in Visual Studio 2012
- Demonstration: Developing the Class Enrollment Application Lab





# Implementing Conditional Logic

- if statements

```
if (response == "connection_failed") { . . . }  
else if (response == "connection_error") { . . . }  
else { }
```

- select statements

```
switch (response)  
{  
    case "connection_failed":  
        . . .  
        break;  
    case "connection_success":  
        . . .  
        break;  
    default:  
        . . .  
        break;  
}
```



# Implementing Iteration Logic

- for loop

```
for (int i = 0 ; i < 10; i++) { ... }
```

- foreach loop

```
string[] names = new string[10];  
foreach (string name in names) { ... }
```

- while loop

```
bool dataToEnter = CheckIfUserWantsToEnterData();  
while (dataToEnter)  
{  
    ...  
    dataToEnter = CheckIfUserHasMoreData();  
}
```

- do loop

```
do  
{  
    ...  
    moreDataToEnter = CheckIfUserHasMoreData();  
} while (moreDataToEnter);
```



# Creating and Using Arrays

- C# supports:
  - Single-dimensional arrays
  - Multidimensional arrays
  - Jagged arrays

- Creating an array

```
int[] arrayName = new int[10];
```

- Accessing data in an array:

- By index

```
int result = arrayName[2];
```

- In a loop

```
for (int i = 0; i < arrayName.Length; i++)  
{  
    int result = arrayName[i];  
}
```



# Referencing Namespaces

- Use namespaces to organize classes into a logically related hierarchy
- .NET Class Library includes:
  - System.Windows
  - System.Data
  - System.Web
- Define your own namespaces:

```
namespace FourthCoffee.Console
{
    class Program { . . . }
```

- Use namespaces:
  - Add reference to containing library
  - Add using directive to code file



# Using Breakpoints in Visual Studio

- Breakpoints enable you to view and modify the contents of variables:
  - Immediate Window
  - Autos, Locals, and Watch panes
- Debug menu and toolbar functions enable you to:
  - Start and stop debugging
  - Enter break mode
  - Restart the application
  - Step through code



# Demonstration: Developing the Class Enrollment Application Lab

- In this demonstration, you will learn about the tasks that you will perform in the lab for this module.



# Lab: Developing the Class Enrollment Application

- Exercise 1: Implementing Edit Functionality for the Students List
- Exercise 2: Implementing Insert Functionality for the Students List
- Exercise 3: Implementing Delete Functionality for the Students List
- Exercise 4: Displaying a Student's Age

Estimated Time: 105 minutes

- You are a Visual C# developer working for a software development company that is writing applications for The School of Fine Arts, an elementary school for gifted children.
- The school administrators require an application that they can use to enroll students in a class. The application must enable an administrator to add and remove students from classes, as well as to update the details of students.
- You have been asked to write the code that implements the business logic for the application.
- During the labs for the first two modules in this course, you will write code for this class enrollment application.
- When The School of Fine Arts ask you to extend the application functionality, you realize that you will need to test proof of concept and obtain client feedback before writing the final application, so in the lab for Module 3, you will begin developing a prototype application and continue with this until the end of Module 8.
- In the lab for Module 9, after gaining signoff for the final application, you will develop the user interface for the production version of the application, which you will work on for the remainder of the course.





# Module Review and Takeaways

Question	
What Visual Studio template would you use to create a .dll?	
Select the correct answer.	
<input type="checkbox"/>	Console application
<input type="checkbox"/>	Windows Forms application
<input type="checkbox"/>	WPF application
<input type="checkbox"/>	Class library
<input type="checkbox"/>	WCF Service application

Test Your Knowledge

Question	
Given the following for loop statement, what is the value of the count variable once the loop has finished executing?	
<pre>var count = 0; for (int i = 5; i &lt; 12; i++) {     count++; }</pre>	
Select the correct answer.	
<input type="checkbox"/>	3
<input type="checkbox"/>	5
<input type="checkbox"/>	7
<input type="checkbox"/>	9
<input type="checkbox"/>	11