**Introduction to Programming - Creating and Running Your First C# Program**

Table of Contents

1. What is Computer Programming?
2. Your First C# Program
3. What is .NET Framework?
4. What is Visual Studio?
5. What is MSDN Library?

**What is Computer Programming?**

* Define - Computer Programming : creating a sequence of instructions to enable the computer to do something

**Programming Phases**

* Define a task/problem
* Plan your solution
  + Find suitable algorithm to solve it
  + Find suitable data structures to use
* Write code
* Fix program error (bugs)
* Make your customer happy

**Your First C# Program**

First Look at C# - Sample C# program:

using System;

class HelloCSharp

{

static void Main()

{

Console.WriteLine("Hello, C#");

}

}

* C# Code – How It Works?

Include the standard namespace "System"

Define a class called "HelloCSharp"

Define the Main() method – the program entry point

Print a text on the console by calling the method "WriteLine" of the class "Console"

* C# Code Should Be Well Formatted

Class names should use PascalCase and start with a CAPITAL letter.

The { symbol should be alone on a new line.

The } symbol should be under the corresponding {.

The block after the { symbol should be indented by a TAB.

* Example of Bad Formatting

What is "C#"?

* Programming language
  + A syntax that allow to give instructions to the computer
* C# features:
  + New cutting edge language
  + Extremely powerful
  + Easy to learn
  + Easy to read and understand
  + Object-oriented

What You Need to Program?

* Knowledge of a programming language C#
* Task to solve
* Development environment, compilers, SDK
  + Visual Studio, .NET Framework SDK
* Set of useful standard classes
  + Microsoft .NET Framework FCL
* Help documentation
  + MSDN Library

Your First C# Program (Live Demo)

What is .NET Framework?

* Environment for execution of .NET programs
* Powerful library of classes
* Programming model
* Common execution engine for many programming languages
  + C#
  + Visual Basic .NET
  + Managed C++
  + ... and many others

Inside .NET Framework

* Building blocks of .NET Framework
* CLR – The Heart of .NET Framework - Common Language Runtime (CLR)
  + Managed execution environment
    - Executes .NET applications
    - Controls the execution process
  + Automatic memory management (garbage collection)
  + Programming languages integration
  + Multiple versions support for assemblies
  + Integrated type safety and security
* Framework Class Library (FCL)
  + Provides basic functionality to developers:
    - Console applications
    - WPF and Silverlight rich-media applications
    - Windows Forms GUI applications
    - Web applications (dynamic Web sites)
    - Web services, communication and workflow
    - Server & desktop applications
    - Applications for mobile devices

What is Visual Studio?

* Compiling, Running and Debugging C# Programs
* Visual Studio
* Visual Studio – Integrated Development Environment (IDE)
* Development tool that helps us to:
  + Write code
  + Design user interface
  + Compile code
  + Execute / test / debug applications
  + Browse the help
  + Manage project's files
* Benefits of Visual Studio

Single tool for:

* + Writing code in many languages (C#, VB, …)
  + Using different technologies (Web, WPF, …)
  + For different platforms (.NET CF, Silverlight, …)

Full integration of most development activities (coding, compiling, testing, debugging, deployment, version control, ...)

Very easy to use!

Creating New Console Application

1. File 🡪 New 🡪 Project ...
2. Choose C# console application
3. Choose project directory and name
4. Visual Studio creates some source code for you

Namespace not required

Some imports are not required

Class name should be changed

Compiling Source Code

* The process of compiling includes:
  + Syntactic checks
  + Type safety checks
  + Translation of the source code to lower level language (MSIL)
  + Creating of executable files (assemblies)
* You can start compilation by
  + Using Build->Build Solution/Project
  + Pressing [F6] or [Shift+Ctrl+B]

Running Programs

* The process of running application includes:
  + Compiling (if project not compiled)
  + Starting the application
* You can run application by:
  + Using Debug->Start menu
  + By pressing [F5] or [Ctrl+F5]

\* NOTE: Not all types of projects are able to be started!

Debugging The Code

* The process of debugging application includes:
  + Spotting an error
  + Finding the lines of code that cause the error
  + Fixing the code
  + Testing to check if the error is gone and no errors are introduced
* Iterative and continuous process

Debugging in Visual Studio

* Visual Studio has built-in debugger
* It provides:

Breakpoints

Ability to trace the code execution

Ability to inspect variables at runtime Visual Studio (Compiling, Running and Debugging C# Programs - Live Demo)

Visual Studio Blank Solution - Creating a Solution Without Projects

What Is a Blank Solution?

* A Visual Studio blank solution
  + Solution with no projects in it
    - Projects to be added later
* What is the point?
  + Not making a project just to give proper name
    - And not working in this project

What is MSDN Library?

* Complete documentation of all classes and their functionality
  + With descriptions of all methods, properties, events, etc.
  + With code examples
* Related articles
* Library of samples
* Use local copy or the Web version at <http://msdn.microsoft.com/>

How to Use MSDN Library?

* Offline version (obsolete)
  + Use the table of contents
  + Use the alphabetical index
  + Search for phrase or keyword
  + Filter by technology
  + Browse your favorite articles
* Online version
  + Use the built-in search: [F1]
* MSDN Library Browsing and Searching Documentation Live Demo

Free Trainings @ Telerik Academy

* Fundamentals of C# Programming Track of Courses
  + - [csharpfundamentals.telerik.com](http://csharpfundamentals.telerik.com/)
* Telerik Software Academy
  + - [academy.telerik.com](http://academy.telerik.com/)
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