Object Oriented Software Development

GCU
Glasgow Caledonian University

1. Introduction to C# and Visual Studio

Teaching staff

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Online resources

- Blackboard/GCULearn
  - Announcements
  - Assessment information
  - Lecture notes and sample code
  - Lab activities
  - Links to other resources

Notes and code samples

- Lecture handouts should be read alongside code samples
- Important to get in the habit of reading and trying out code
- Code will be available to download from Blackboard
- Code is in the form of projects which can be opened in Microsoft Visual Studio

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Getting Visual Studio

- Visual C# 2010 Express
  - Free download
  - http://www.microsoft.com/express/downloads/#2010-Visual-CS
- Visual Studio 2010 Professional or Ultimate
  - Available to students through MSDNAA
  - Info on Blackboard
- Visual Studio 2012 now available
  - Backwards compatible with 2010 projects
  - VS2010 in labs, but you can try 2012 yourself

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Reading

- The following free online book may be useful for additional reading and reference:
  - C# Yellow Book by Rob Miles, http://www.robmiles.com/c-yellow-book/
- MSDN (Microsoft Developer Network) is the **definitive resource** for reference. Useful starting points:
  - http://msdn.microsoft.com/en-US/vstudio/hh388566
  - http://msdn.microsoft.com/en-us/library/kx37x362.aspx
  - http://msdn.microsoft.com/en-us/library/ms229335.aspx

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Reading

- Microsoft Beginner Developer Learning Center
  - Tutorials on programming aimed at a range of different levels of expertise
  - http://msdn.microsoft.com/en-gb/beginner/dd435692.aspx

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Assessment

- Exam – 50%
- Coursework assignment(s) – 50%

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Aim of module

- To learn the principles of object oriented programming
- To learn how to develop object oriented software applications
- We will use C# as an example of an object oriented programming language
- Aim to learn general principles, but some content will necessarily be C# specific

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What is C#?

- C# is a modern object oriented programming language
- Has a syntax which has similarities to Java and C/C++
- C# skills are particularly valued by employers
- Is one of the languages supported by Microsoft's .NET Framework
- C# programs can be developed using Microsoft Visual Studio

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The .NET Framework

- Microsoft's modern software development platform
- Supports several programming languages, including C#, Visual Basic, C++, F#
- Programs executed by Common Language Runtime (CLR)
- Includes a large library of components (classes) which can be used in programs

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Visual Studio

- Powerful, professional Integrated Development Environment (IDE)
- Integrates compilers, debugger and many other useful tools for development
- Can work with many different types of project, including:
  - Console (text-based) applications
  - Windows (GUI) applications
  - Web applications (ASP.NET)
  - Class libraries

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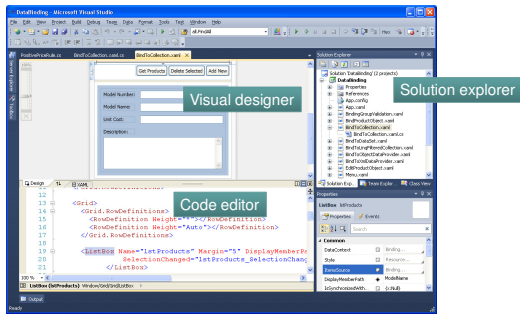Object Oriented Software Development
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Visual Studio features (a few)

Visual designer
Solution explorer
Code editor

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Visual Studio solutions and projects

- Solutions and projects group the items needed to create a program, or application
- A **solution** is a container for one or more related projects
- A **project** represents a particular part of a solution
- For example, you might want to work with a Windows application project and a related class library project as part of the same solution

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Visual Studio projects

- A project contains source code files, settings and resources for an application
- May contain references to class libraries
- May contain data used by application
- **Building** a project:
  - Compiles source files
  - Copies non-source files to output folder
  - Creates an assembly in output folder
- Building a solution builds all its projects

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Creating a Visual Studio project

● Demo

Project templates

Console application

ASP.NET (Web) application

WPF (Windows) application

Project details

Solution folder contents

Project folder contents

References – class libraries used by this application

Solution file (.sln) and project file (.csproj) are created by VS and contain solution/project configuration information

What's next?

- In this module you will learn to:
  - Design and implement object oriented software applications
  - Debug and test your applications
  - Document your applications
  - Create Windows user interfaces
  - Store and retrieve data in files and databases

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