Object-Oriented Software Design and Development
CCP114N

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This lecture

- Introduction to the module
  - Module contents
  - Learning resources
  - Assessment
- Review of Java – Part 1
  - Revision
    - How write/compile/run a Java program
    - Where to get help if you get stuck or want to learn more
  - Review of tools for java programming

What will be covered in CCP114N?

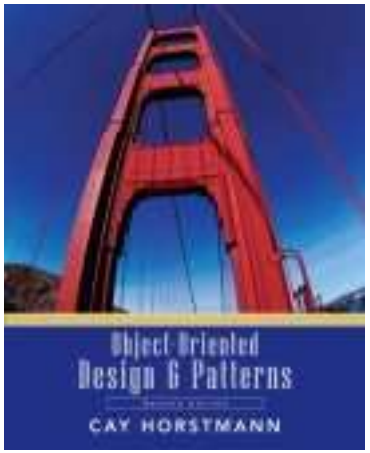
- Pre-requisite
  - Have learned (or experience of)
    - Java programming or
    - an object-oriented programming language such as C++, Object Pascal in Delphi, etc.
- This module will take you up a level
  - To design software systems (not the ‘system’ as meant in “system analysis in design”) from a system specification, using an object-oriented method.
  - To implement (simple, but not trivial) software systems from an OO design, using the Java programming language.
- In particular, you will learn and consolidate
  - fundamentals of OO and class design/implementation
  - some Java GUI programming using SWING classes
  - some Java Collections classes to implement data structures

Learning and Assessment

- Weekly
  - Lecture
  - Workshop
- Assessment
  - The coursework (50%)
    - Group of 3 people (max)
  - Final written examination (50%) : at the end of the semester
  - Pass on Aggregate mark

Learning Resources

- The module WebLearn course can be found at:
  http://www.londonmet.ac.uk/
  - Module materials: lecture notes/slides, weekly exercises; assignments & tests
  - URLs to online resources e.g. Java Tutorials, software tools etc.
- The textbook is
  - Object-Oriented Design and Patterns, 1st or 2nd edition, Cay Horstmann, John Wiley
- Other interesting books, e.g.
  - Thinking in Java, 3rd Edition, Bruce Eckel, ISBN: 013-100287-2, 2003, Prentice Hall. Also available online (free) at www.MindView.net
  - Software Design: From Programming to Architecture, Eric J. Braude, ISBN: 0-471-20459-5, ©2004, John Wiley
- If you have Deitels it would be useful as it covers class design (little), data structures, GUI programming and event handling with many working program examples.
  - Java How to program by Deitel and Deitel

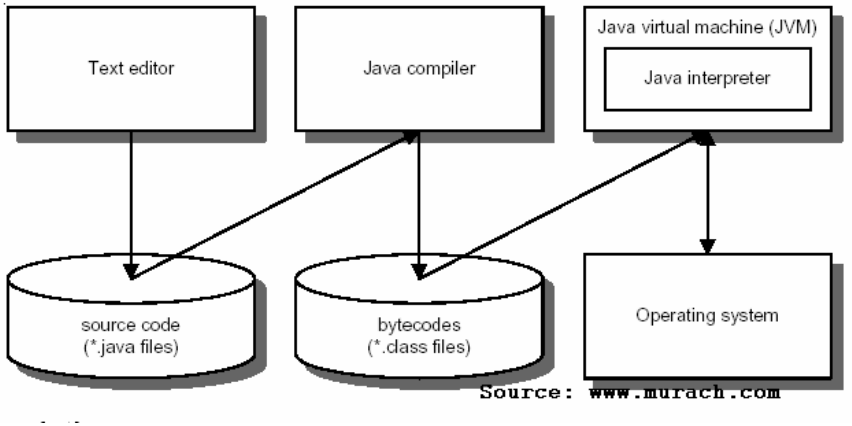


Where & what to start with

- This week and next week we will revise (and introduce for those who're new to Java) the Java basics for you to get momentum to go further with OO software design & development
  - Please note: this is an advanced programming module
  - Anyone has not programmed in Java please catch up, or do a introductory Java module of the pre-master course first (talk to your Course tutor).
- You will need at least the Sun Java SDK to compile, run, debug and document your Java programs.
  - The current version is 1.6, can be downloaded free from java.sun.com
  - SDK is NOT the Java JRE – Java Runtime Environment, in fact it includes JRE.
  - A Java program source code can be edited using any text editor, such as Windows Notepad, or Unix vi

How Java compiles and interprets code

- When you develop a Java software you write Java code in Java classes
  - A class defines methods and data for its instances (i.e. objects of the class)
  - Generally you need to create an object of a class to “run” its methods
- A Java software may be: an *application*, an *applet* or a *servlet.*
- In this module we only deal with Java *application*
  - A Java application could have one or more classes, but must have one class with a main( ) method to be invoked by the Java interpreter at the application start-up



Java Integrated Development Environment (IDE)

Lightweight IDEs

- **JCreator**: the LE version is free and installed in our laboratory PCs
  - Java code syntax-highlighting
  - Java API keyword look-up
  - compile & run at a click of a button
  - no debugger in the LE version.
  - Class member view & project management facilities
- **BlueJ**: free, educational Java IDE, very useful tool for learning and visualising classes and objects in Java
  - UML-like class diagram
  - Good for visualising class hierarchies and ‘live’ objects in action
    - Has a debugger
    - Includes Unit testing tool.
- **Gel** an interesting Java IDE, free from www.gexperts.com
  - Similar to JCreator LE, but also has
    - instant Java docs for method under the cursor (great for learning)
    - Debugger

Java Integrated Development Environment (IDE)

Full-blown & text editors

- **Full-blown IDEs**
  - **NetBeans** (open-source) or Sun[tm] ONE Studio
  - Borland **JBuilder** (Turbo - free)
  - **Eclipse** (open-source from IBM)
- **Java-supported Programmer Editors**
  - **TextPad, Crimson**, **syn Text Editor**, and many more
    - editors with Java syntax highlighting and can be configured to compile, run Java programs, and to provide context-sensitive help from Java SDK documentation.
    - small memory footprint and fast
  - **jEdit** - a powerful, free, open-source programmer editor written in Java.
    - cross-platform
    - extensible with numerous plug-ins.
    - You can have it as basic, or as versatile as you like
      - Can become an IDE

Summary

- About the module
  - Emphasize on OO software design
  - Involve ‘real’ Java programming
- Learning resources
  - WebCT
  - Books
  - Online
- Java programming tools
  - The Sun Java SDK
  - IDEs
  - Programmer Editors