CSA 1012
Object-Oriented Programming

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Course Objectives

• Familiarity with the syntax of the Java or C# language
• Programming in an object oriented style
• Building structured, reusable, manageable platform independent stable code
• Course Structure:
  – Basic Java/C# syntax
  – OOP
  – OOP using Java/C#
Introduction

• 2 Hour lecture will be given every week
• You are assumed to know previous lecture by the next lecture.
• Practicing at home will be necessary since organised practical sessions will be difficult to organise.
• Course Notes will be supplied and are available at:
  – www.cs.um.edu.mt/~jcord
• Practical assignment will make part of the credit together with a written test.
• Take your own notes in the lecture hall as they will be essential.
Requirements

• Recommended Textbooks:
  – C#:How To Program; Deitel and Deitel; ISBN 0-13-06222104

• Java Compiler and Documentation:
  – Available at http://java.sun.com as Java 2 SDK 1.3 or 1.4 (J2SE)
  – Docs at http://java.sun.com/j2se/1.4.1/docs/api/index.html
    – Remember to add the bin directory to your path (in autoexec.bat for Windows)
    – Command prompt programming is recommended (‘command’ or ‘cmd’)
    – Yet you can use any IDE such as JBuilder and Forte

• C# Compiler and Documentation
  – Csc.exe is a free C# compiler; alternative Visual Studio .net
Why Java/C#?

• Java/C# is just another programming language but has several special feature:
  – Simple making it easy to learn and use
  – Reliable and Robust
    • Some of its features are formally proven
    • Has many built in features such as memory management and garbage collection
    • Most features are tested at run-time.
  – Platform independent
    • Never compiles to machine code but to byte-code/MSIL
    • Any platform using JVM/.Net (CLR) can run this byte code
  – Distributed
  – Secure
  – Interpreted making development easier
  – Multi-threaded
  – Dynamic making changes on the fly possible
  – Object Oriented
Why Object Oriented?

- Object Oriented Programming is an approach towards programming where we take a more natural view of the problem domain as compared to procedural programming.

- Main Features of OOP are:
  - Abstraction
  - Encapsulation
  - Modularity
  - Hierarchy

- Java/C# can still be used as a non-OOP language but it acts as an aid towards OOP. A more strict language is SmallTalk and a less strict language is C++. 
Your First Program in Java

• Type the following using the edit command or notepad

```java
import java.io.*;
public class HelloWorld {
    public static void main (String [] args) {
        System.out.println ("Hello World!");
    }
}
```

• Save as HelloWorld.java
• Invoke Compiler : javac HelloWorld.java
• Invoke JVM : java HelloWorld
• Should see ‘Hello World!’ printed to screen.
• See that CLASSPATH is not set or set to current directory.
• doskey comes in handy.
Your First Program in C#

```
using System;
class Welcome1 {
    static void Main (String[] args) {
        Console.WriteLine
            ("Hello World!");
    }
}
```

- Compile using appropriate buttons, and then execute.
Sample Output

```
C:\Programs\Java>edit HelloWorld.java
C:\Programs\Java>javac HelloWorld.java
C:\Programs\Java>java HelloWorld
Hello World!
C:\Programs\Java>
```
Template for Programs

• The following template should be used until we cover what each keyword means.

```java
import java.io.*;
public class ClassName {
    public static void main(String args[])
    {
        // your programming code
    }
}
```

```c#
using System;
class ClassName {
    static void Main(String args[])
    {
        // your programming code
    }
}
```

• ClassName can be changed to whatever you wish but always save your program in a file ClassName.java

• **Java/C# Is Case Sensitive**

• After compiling, a byte/MSIL file called ClassName.class/Filename.exe is created.
Exercises

• Try to compile the HelloWorld program.
• Create programs under a different classname.
• Make your program print out your name.
• Make your program print out 3 copies of your name under each other.