Computer Science 101 S1

Lecture 2

Contents

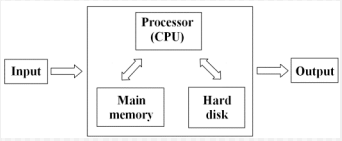
Using DOS commands
Installing Java
Writing the "Hello World" program

Coursebook: **§1, §2**

Computer Organisation

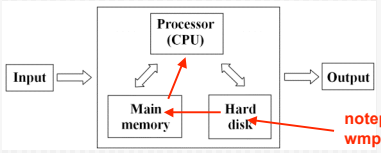
Most computers consist of three major components:

- a processor (central processing unit)
- main memory
- a long term storage device such as a hard disk



Computer Organisation

Computer programs are stored as files on the hard disk.



When a program runs, the file is first transferred to main memory, and the processor then executes the instructions from main memory one at a time.
What do these instructions look like?

Computer Organisation

Every computer's processor understands a small set of very primitive instructions, for doing things such as:

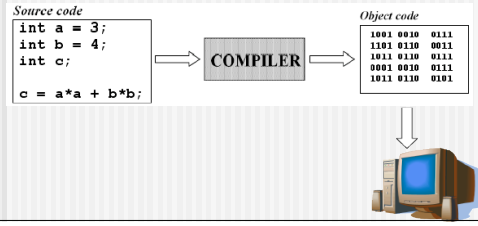
- moving data around
- performing arithmetic
- making decisions about which instruction to execute next

These instructions are known as *machine language* or *machine code* and are represented in binary form as 1's and 0's.

Compilers

A *compiler* translates *source code* into *object code*

- first, the entire program is converted to machine code
- then, the compiled code can be executed on the computer



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Interpreters

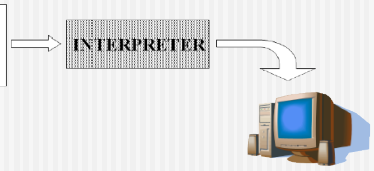
An *interpreter* translates and executes *source code*

- one instruction at a time is converted to machine code and executed by the processor

Source code

```
int a = 3;
int b = 4;
int c;

c = a*a + b*b;
```



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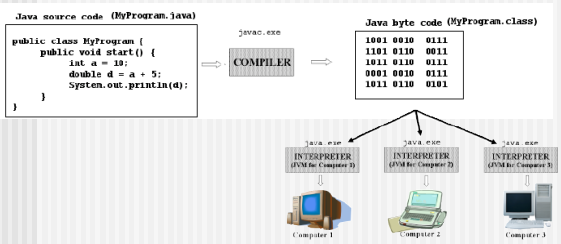
Java – a mixed system



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`javac, java` commands

All Java files have the extension `.java`. For example, `MyApplication.java`, `MyProgram.java`.

To compile Java programs we use the `javac` command. For example,

```
javac MyApplication.java
```

To run an application we use the `java` command. For example,

```
java MyApplication
```

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Installing Java

http://java.sun.com

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Java - What version?

There are several equivalent names:

- Java Standard Edition Development Kit
- Java SE Development Kit
- **JDK**

Any version since 5 is fine, so we should install:

- JDK 5 or JDK 6

Don't be confused by the internal version numbers:

- JDK 5: JDK 1.5.0_06
- JDK 6: JDK 1.6.0

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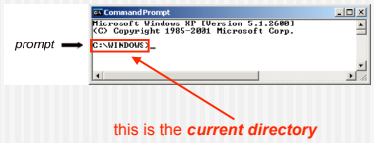
DOS Commands

The Java tools are designed to be executed at the command line.

To open a Command Prompt window:

Click on the Start menu which is usually located in `Programs > Accessories`



this is the ***current directory***

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DOS Commands

The following commands are useful:

cd – **change directory (folder)**

dir – **directory listing**

cd directoryName	makes the specified directory the new current directory
cd ..	makes the parent directory (one level up) the new current directory
dir	lists all of the files and directories in the current directory

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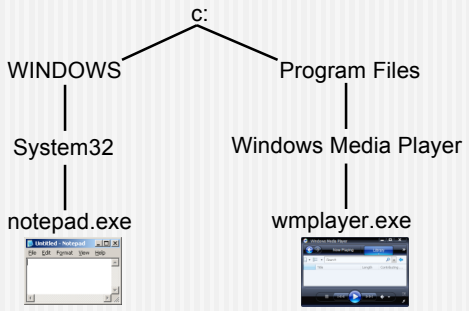
NotePad and Windows Media Player



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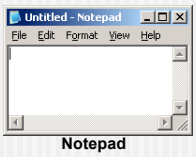
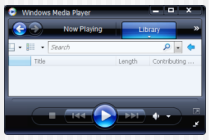
Running Programs



Notepad



Windows Media Player

How would you run each of these programs?

How could you run these programs without using the Start menu?

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Executing programs

Windows needs to know where to look for the program executable.

Windows will look in the directory specified explicitly at the command line:

C:\> \Program Files\Windows Media Player\ wmplayer

Windows will look in the current directory:

C:\WINDOWS\system32> notepad

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Executing programs

Windows needs to know where to look for the program executable.

Windows will look in the directory specified explicitly at the command line:

C:\WINDOWS> c:\Program Files\Java\ jdk1.5.0_06\bin\javac …

Windows will look in the current directory:

C:\Program Files\Java\jdk1.5.0_06\bin> javac …

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PATH

Windows will also look for executables in any directory that is listed by the **PATH** environment variable. For example, if the **PATH** environment variable stores the following directories:

PATH = C:\WINDOWS\system32;
C:\Program Files\Java\jdk1.5.0_06\bin;
C:\My Other Folder;

the following commands will work:

C:\CS101S1_07\Lecture02\MyFirstProgram> javac MyApplication.java

C:\WINDOWS> notepad

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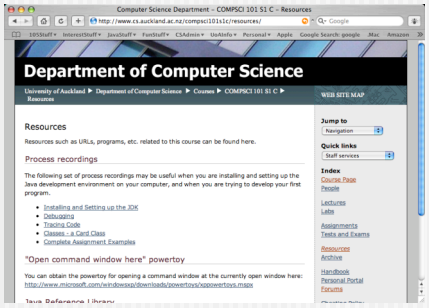
Process Recordings



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A first program

"Hello World!"

Our first Java program will simply print "Hello World!" to the screen when it is executed.

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File structure

Our programs will consist of TWO source files:

MyApplication.java

starts our program (a bit like a starter motor in a car)

MyProgram.java

contains the instructions describing what we want the program to do

Both files will need to be compiled into byte code:

```
> javac  MyProgram.java
> javac  MyApplication.java
```

We run the MyApplication program using :

```
> java  MyApplication
```

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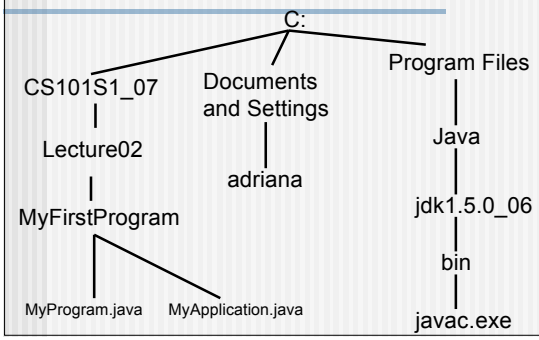
File System



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MyApplication.java

```
public class MyApplication {
        public static void main(String[] args) {
                MyProgram p = new MyProgram();
                p.start();
        }
}
```

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MyProgram.java

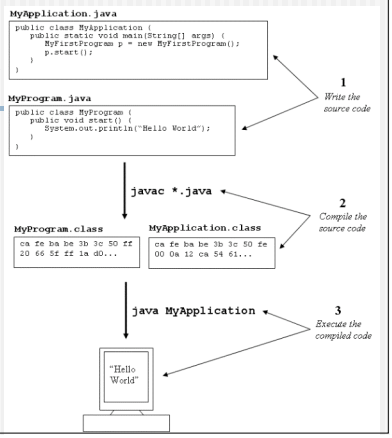
```
public class MyProgram {
        public void start() {

                Our instructions for the program go here

        }
}
```

System.out.println("Hello World!");

Overview



What you need to know

How to open the Command Prompt.

DOS Commands: `cd` **directoryName**, `cd ..`, `dir`

All Java files have the extension `.java`

Every Java class is stored in a file with the same name as the class.

What you need to know

We use two files: the application class and the program class:
the application contains the name of the program it is running,
the program contains the code we want to execute.

`javac` - used to compile a Java program into byte code

`java` – used to run the application

To run the code: compile the application class and compile the program class.
Run the application using the name of the class WITHOUT the .java extension.

```
public class                              {

        public static void main(String[ ] args) {
                        p = new                   ();
                p.start();
        }
}
```

```
public class                              {
        public void start() {









        }
}
```