Chapter 1

Hello World!

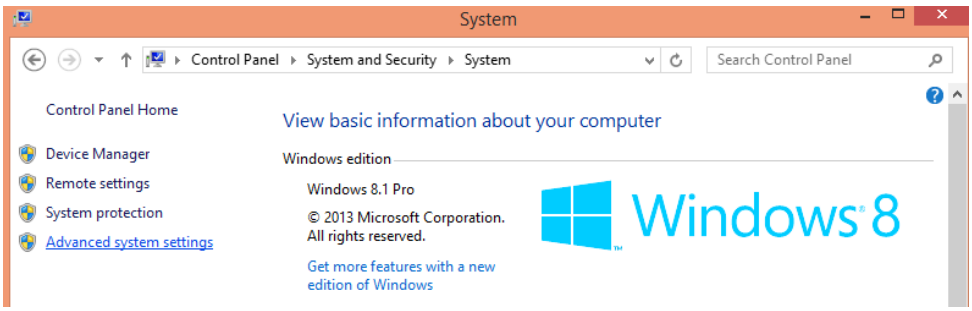
Java was released in 1995 by Sun Microsystems and Java remains one of the most popular programming languages today. Java is famous for its "write once, run everywhere" nature, because Java Virtual Machine ensures the same Java code can be run on various OS and platforms. Without further ado, let's start.

1.1 Download and install Java Development Kit

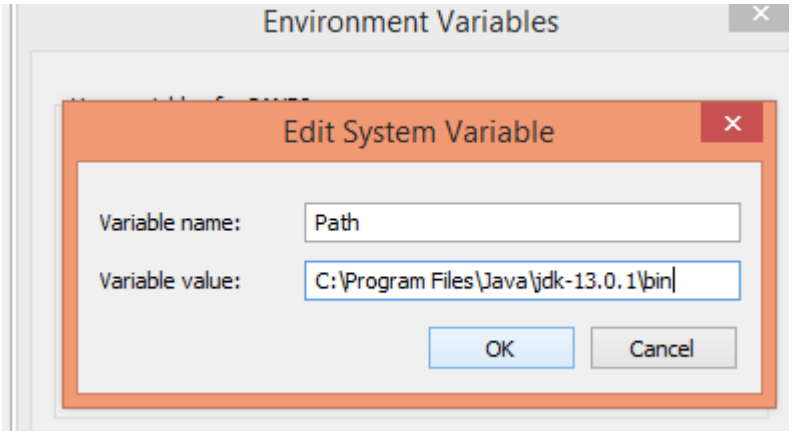
Before being able to do anything, we need Java Development Kit that you can download in Oracle's website (https://www.oracle.com/technetwork/java/javase/downloads/index.html).

1.2 Edit your environment variables

Go to control panel, choose System and Security, choose System and click on Advanced system settings.



Next click on Environment Variables, on the System variable, edit the Path variable value, find where your JDK's installation bin folder is and then copy and paste the path.



1.3 Type your first code using a notepad

```
public class helloworld {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
  }
}
```

A Java program must have one class whose name is the same as the program filename. In the example, the helloworld class must be saved in a program file named helloworld.java .

1.4 Compile this program

Go to command prompt and change the directory to where you store your helloworld.java.

```
c:\oop>javac helloworld.java

c:\oop>
```

If there is no error, you can run the program with the java command straightaway.

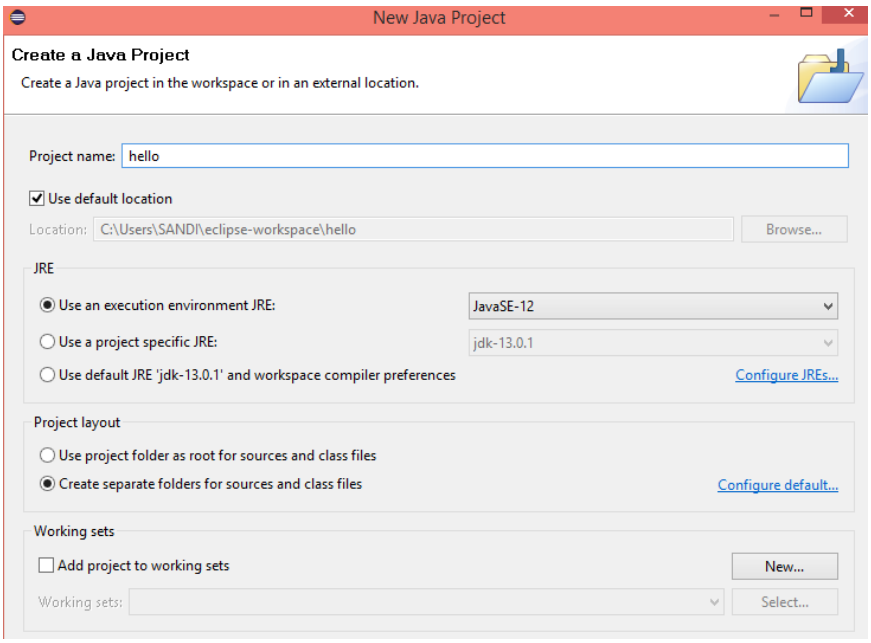
```
c:\oop>java helloworld
Hello, World!
```

The code we write in a .java file is transformed into byte code by a compiler before it is executed by the Java Virtual Machine on your computer. The compiling process catches mistakes before the computer runs our code. The Java compiler runs a series of checks while it transforms the code. Code that does not pass these checks will not be compiled.

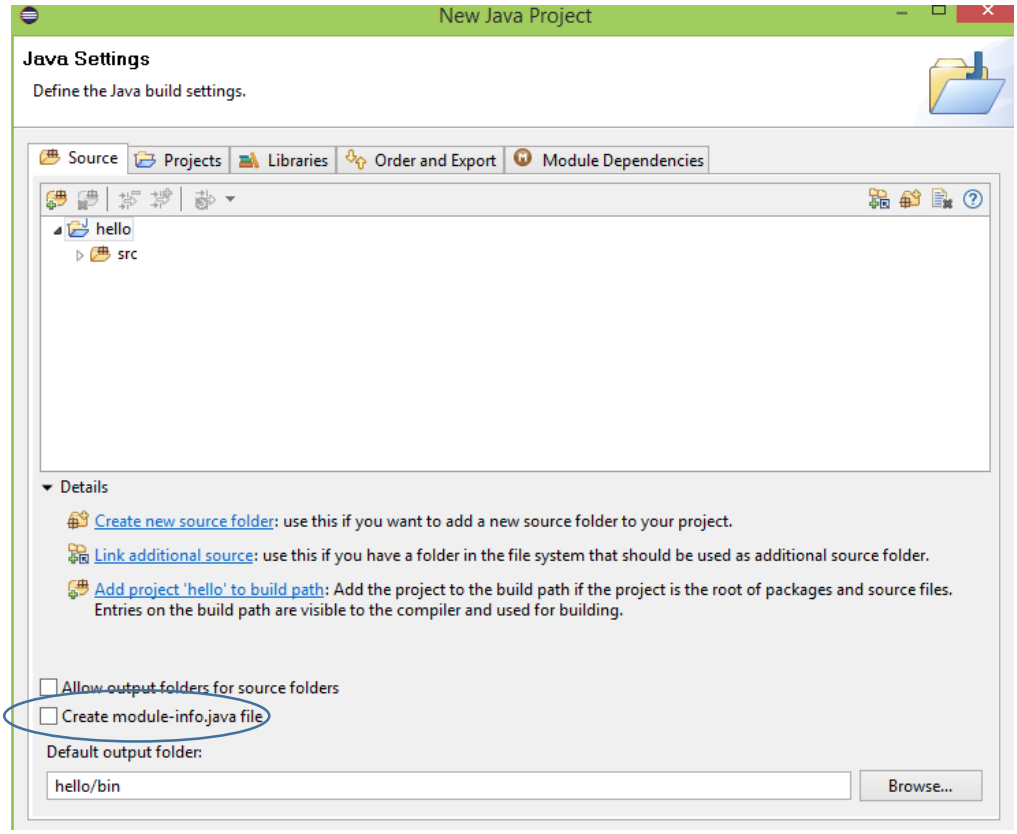
If the file compiles successfully, an executable class will be produced, in this case helloworld.class. Executable means we can run this program from the terminal. And we run this executable using the command java helloworld (note that we do not need to include .class file extension).

1.5 Next, let's use Eclipse

First create a Java Project, let's call it "hello".

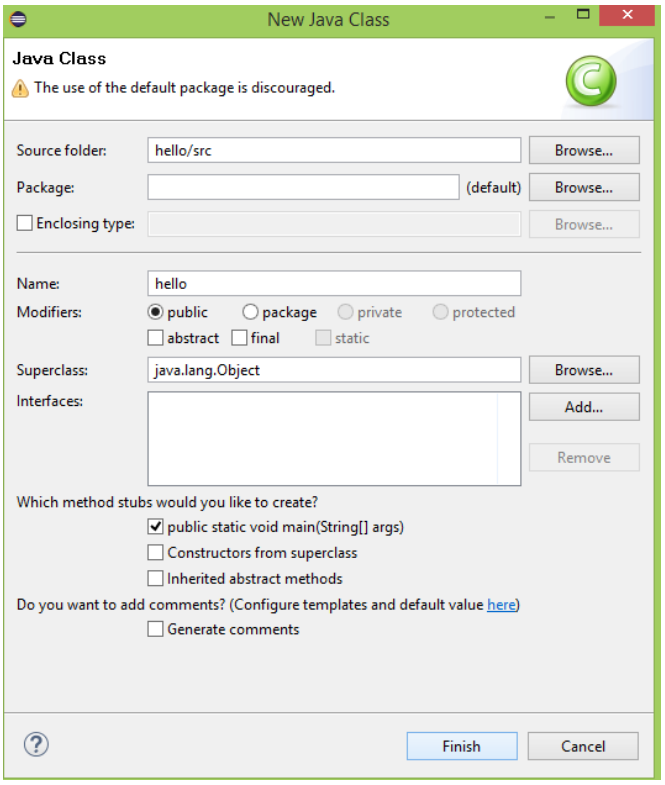


Click next, and uncheck "Create module-info.java file".

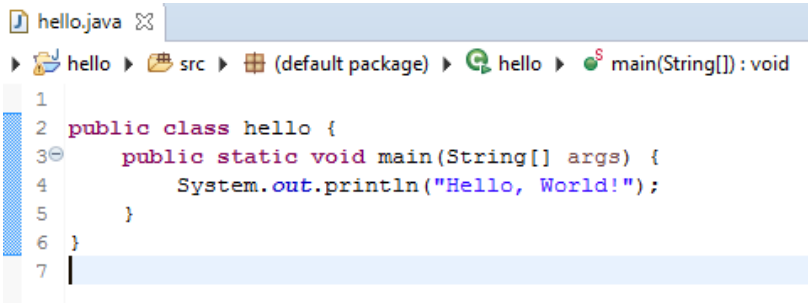


1.6 Create hello.java in Eclipse

From the menu, choose File > New > Class



1.7 Type your code and run it



There is no need to compile the Java source file in Eclipse explicitly because Eclipse performs incremental compilation, so Java statement is compiled as and when it is entered. To run the program, right-click anywhere on the source file "Hello.java" (or choose "Run" menu) ⇒ Run As ⇒ Java Application. The output "Hello, world!" appears on the Console panel.

Now explanation of our simple helloworld codes:

- The Main Method in Java
  - In Java, every application must contain a main() method, which is the entry point for the application. All other methods are invoked from the main() method. The signature of the method is public static void main(String[] args) { }. It accepts a single argument: an array of elements of type String.
- Print Line in Java
  - In Java, System.out.println() can print to the console. System is a class from the core library provided by Java, out is an object that controls output, println() is a method associated with that object that receives a single argument.
- Comments in Java
  - In Java, comments are bits of text that are ignored by the compiler. They are used to increase the readability of a program.
  - Single line comments are made by using // and multi-line comments are made by starting with /* and ending with */.
- Whitespace in Java
  - Whitespace, including spaces and newlines, between statements is ignored.
- Statements
  - In Java, a statement is a line of code that executes a task and is terminated with a ;.