
MAHARISHI UNIVERSITY of MANAGEMENT
Engaging the Managing Intelligence of Nature
Computer Science Department
CS390 Fundamental Programming Practices (FPP)
Professor Paul Corazza

Lecture 1:
Introduction to Java And the Eclipse Development Environment

Pulling the Arrow Back to Hit the Target

Wholeness of the Lesson

Java is an object-oriented highly portable programming language that arose as an easy alternative to the once dominant, but error-prone, C++ language. Eclipse is one of many open source, powerful but easy-to-use integrated development environments for use with Java and related technologies. Working from deeper levels of intelligence allows one to accomplish more with fewer mistakes and less effort.

About Java

- ***Brief History.*** The Java language began as a language for programming electronic devices, though the original project was never completed. Its creator was James Gosling, of Sun Microsystems. The language was developed privately starting in 1991, and was made publicly available in 1994. In 2009, Oracle bought the rights to Java from Sun Microsystems.

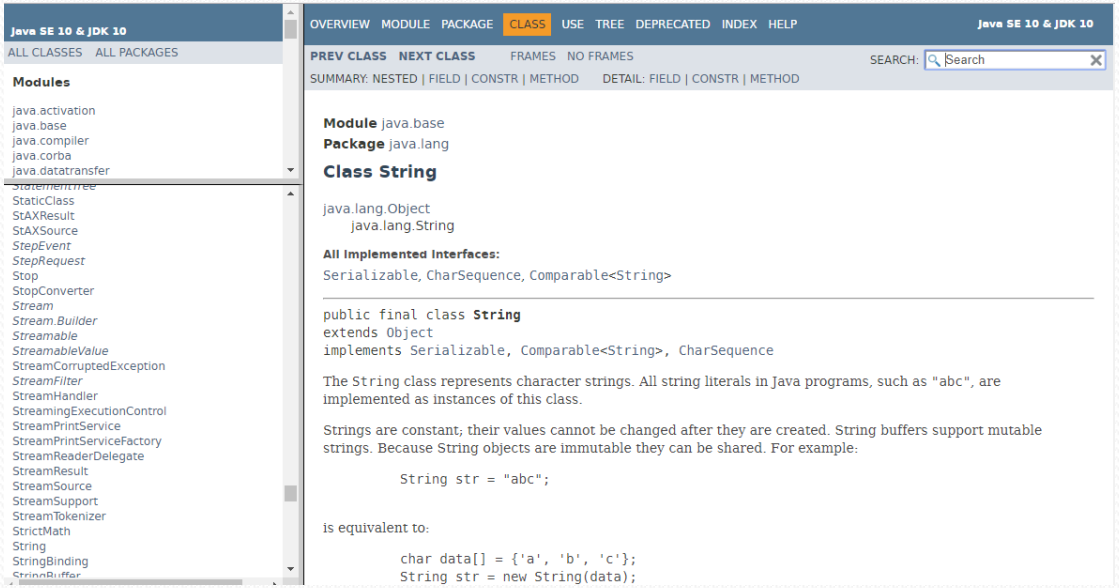
- ***Java Is an OOP Language.*** Java is an object oriented programming language. This means that Java programs are designed by defining software objects that interact with each other (mirroring the way things get done in the real world).

- ***Number 1 Language.*** For more than 20 years, Java has been the Number 1 programming language in the IT world.

The Java 10 API Docs

- Oracle provides online documentation of all the Java library classes. Full documentation of each class in the Java libraries is provided. For Java 10, the link is

  https://docs.oracle.com/javase/10/docs/api/index.html?overview-summary.html



Integrated Development Environments

- A good IDE supports compiling, running, and debugging code with tools that are integrated and typically easy to use. For a large Java project, an IDE is indispensable.
- Good choices of IDE are NetBeans, IBM Rational Application Developer (formerly WebSphere Application Developer), Borland's JBuilder, JetBrains' IntelliJ
- Another excellent choice, which has become an industry standard, is the open-source IDE Eclipse, written entirely in Java. Among IDEs for Java, in recent years, Eclipse is the most widely used. We will use Eclipse in this course.

The Eclipse IDE

- *Getting started*. To use Java 10, you need Eclipse Oxygen (or later); earlier versions of Eclipse do not support Java 10.

- Features of the IDE [demo]
  - Workspace > project > package > class
  - "Perspectives" in Eclipse: Java and Debug perspectives
  - Setting preferences
  - Save / compile / run / debug (example: HelloWorld)
  - Auto-formatting

"Hello World"

- We create a simple Java program. This involves creating a package and then defining a class inside that package.


```java
package hello;

import javax.swing.JOptionPane;

public class HelloUI {
    public static void main(String[] args) {
        JOptionPane.showMessageDialog(null, "Hello John!");
    }
}
```

In-Class Exercise 1.1

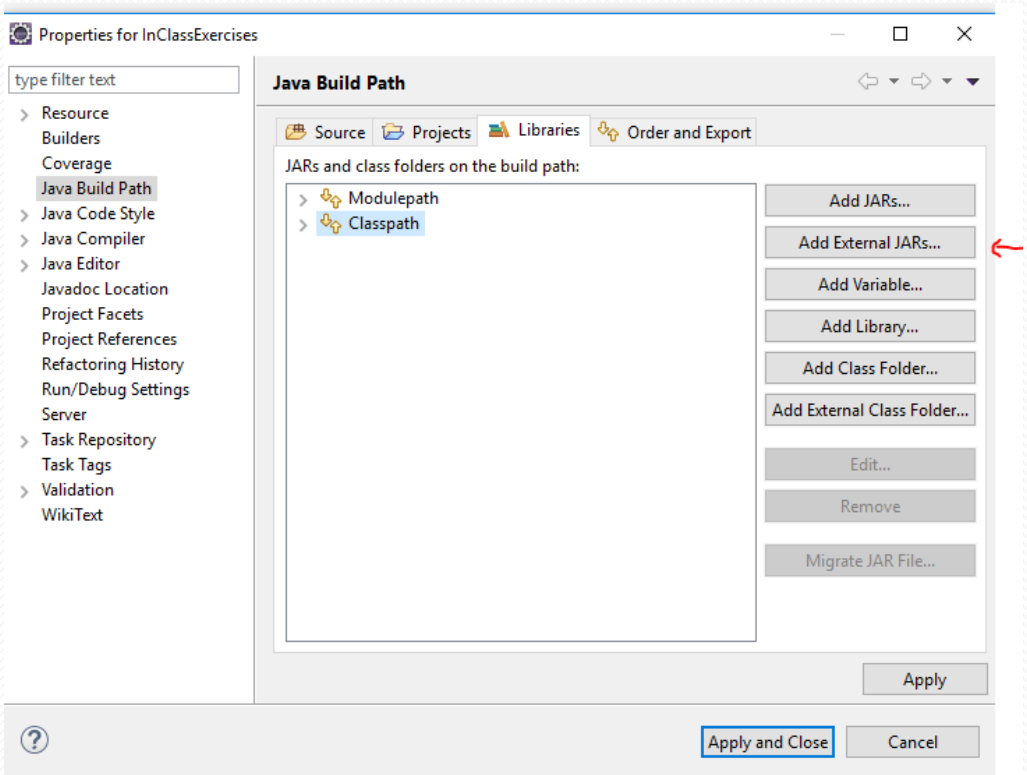
- In this exercise you will run a Java application Sample within your Eclipse workspace, available in the InClassExercises project.
- The comments written in the class Sample explain many details about basic Java code. The goal is to study the code and run it to get a feeling for how it works, and then try to use what you have learned to implement the requirements in a second Java class MyClass.

In-Class Exercise 1.2

- In this exercise you will once again study sample code contained in a package lesson1.exercise_2.program, and try to use what you have learned to write some additional code.
- This program illustrates how in a Java program, objects interact with other objects to produce the desired program behavior.
- To make the sample code run properly, an extra library needs to be added in the form of a JAR file

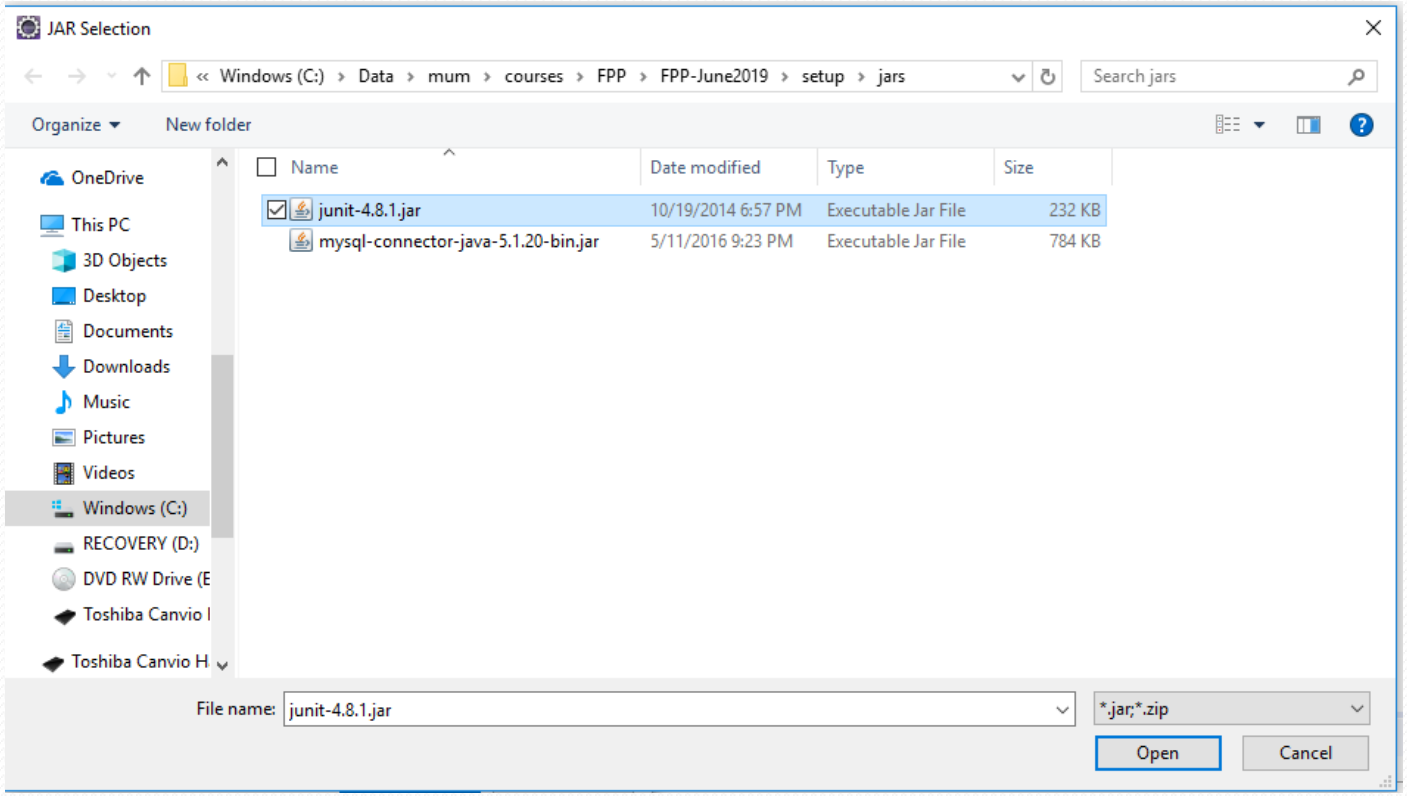
Adding JAR Files in Eclipse

You need to add junit-4.8.1.jar to the "classpath". Do the following: Right click on the Project (here, it is InClassExercises) and select Properties > Java Build Path, select Classpath, and click Add External Jars...



Adding JAR Files in Eclipse

- Navigate to junit-4.8.1.jar in fpp-setup (this is found in the Set-up zip file in Resources), select and click Open



Then click Apply and Close

Main Point

Eclipse is a leading, open-source, integrated development environment, which provides excellent support for editing, compiling, running, and de-bugging Java applications. By analogy, to create a good life, we need to handle inner life and, at the same time, structure a life-supporting environment – the goal is to live 200% of life.

Connecting the Parts of Knowledge With the Wholeness of Knowledge

1. Using Java, highly functional applications can be built more quickly and with fewer mistakes than is typically possible using C or C++.
2. To optimize the use of Java's features, IDEs such as Eclipse ease the work of the developer by handling in the background many routine tasks.

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3. **Transcendental Consciousness:** To be successful, action must be based on the field of pure intelligence, which is located at the source of thought.

4. **Wholeness moving within itself**: In Unity Consciousness, the pure intelligence located in TC is found pervading all of creation, from gross to subtle.