Core Java 8 and Development Tools

Lesson 01: Introduction to Java

Lesson Objectives

- After completing this lesson, participants will be able to -
  - Introduction to Java
  - Features of Java
  - Evolution in Java
  - Developing software in Java

Java's Lineage

- C language was result of the need for structured, efficient, high-level language replacing assembly language.
- C++, which followed C, became the common (but not the first) language to offer OOP features, winning over procedural languages such as C.
- Java, another object oriented language offering OOP features, followed the syntax of C++ at most places. However, it offered many more features.

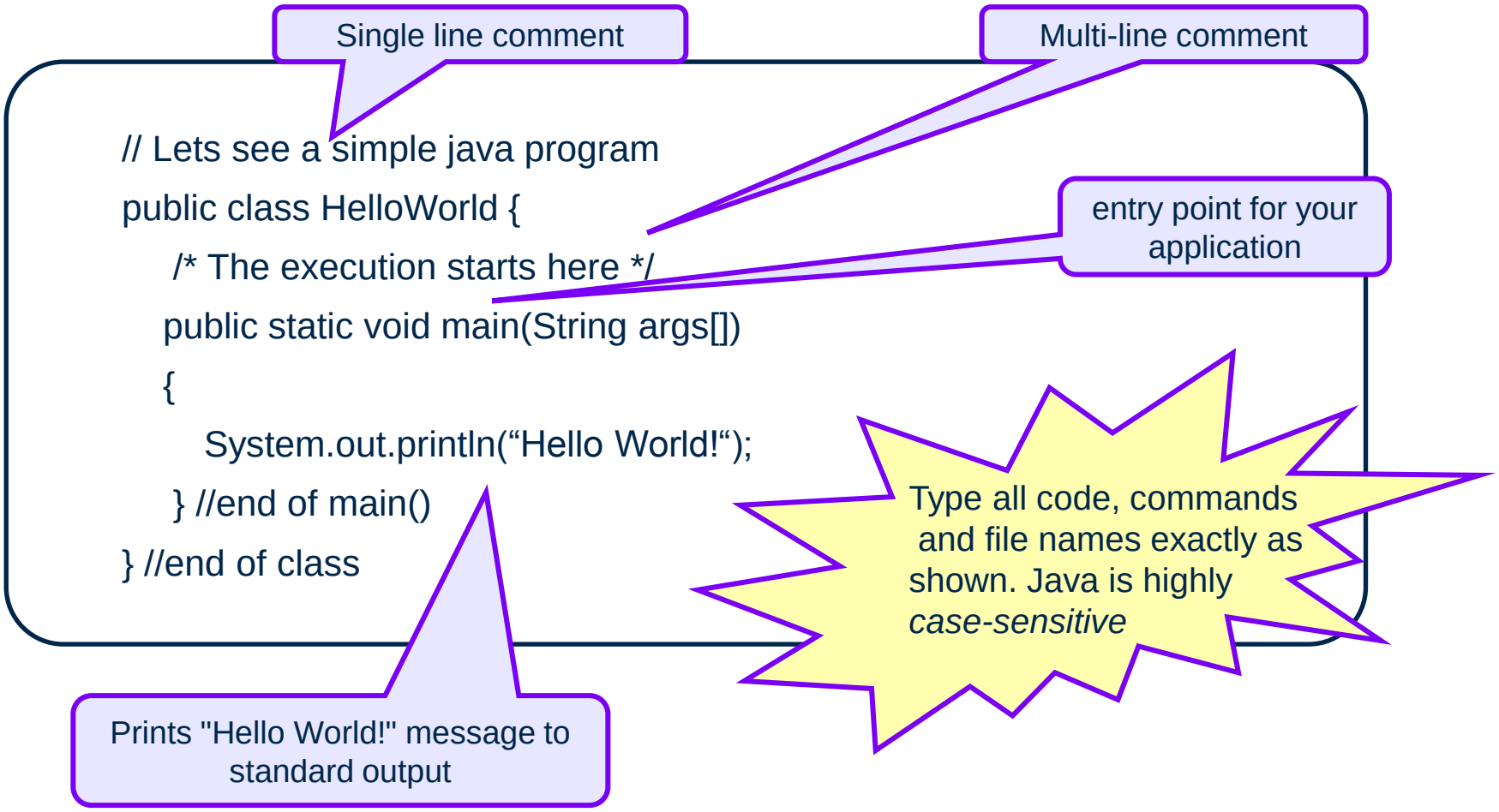
What is Java?

- Java is an Object-Oriented programming language – most of it is free and open source!
  - It is developed in the early 1990s, by James Gosling of Sun Microsystems
  - It allows development of software applications.
  - It is amongst the preferred choice for developing internet-based applications

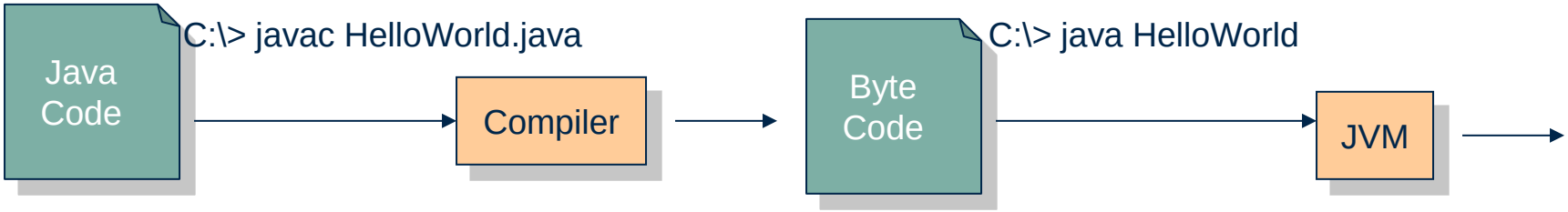
Java Language Features

- Java has advantages due to the following features:
  - Completely Object-Oriented
  - Simple
  - Robust: Strongly typed language
  - Security
    - Byte code Verifier
    - Class Loader
    - Security Manager
  - Architecture Neutral: Platform independent
  - Interpreted and Compiled
  - Multithreaded: Concurrent running tasks
  - Dynamic
  - Memory Management and Garbage Collection

A Sample Program



Java Development Process



Compiling Java program

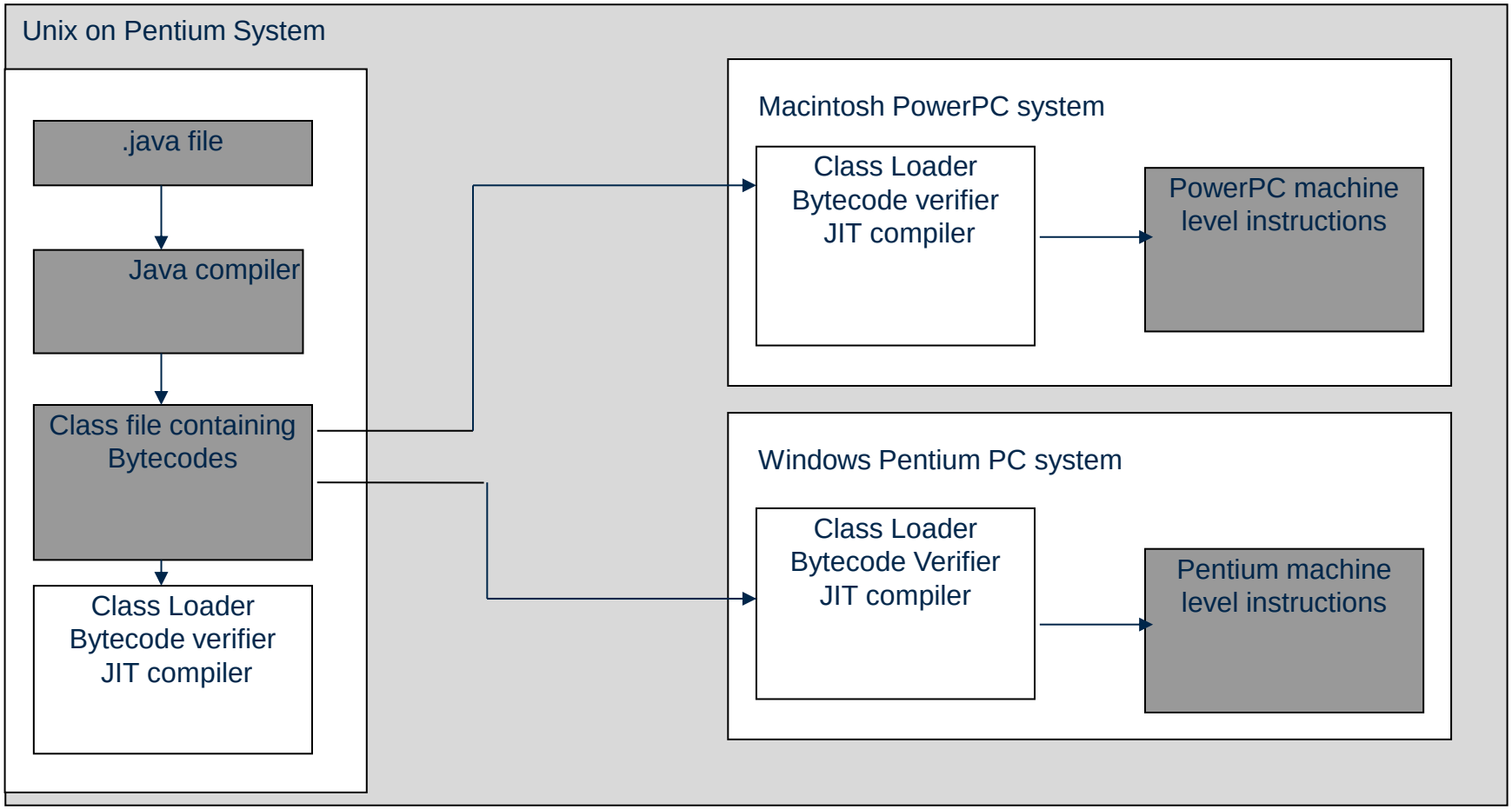
```
C:\WINNT\system32\cmd.exe

F:\JEE-Demos>javac HelloWorld.java

F:\JEE-Demos>java HelloWorld
Hello World!

F:\JEE-Demos>_
```

Running Java program

Demo

- Creating and executing the First Java application

Platform Independence feature of Java



JRE versus JDK

- JRE is the “Java Runtime Environment”. It is responsible for creating a Java Virtual Machine to execute Java class files (that is, run Java programs).
- JDK is the “Java Development Kit”. It contains tools for Development of Java code (for example: Java Compiler) and execution of Java code (for example: JRE)
- JDK is a superset of JRE. It allows you to do both – write and run programs.

Summary

- In this lesson, you have learnt:
  - Features of Java and its different versions
  - How Java is platform Independent
  - Difference between JRE and JDK
  - Writing, Compiling, and Executing a simple program

Review Question

- Question 1: A program written in the Java programming

  language can run on any platform because...
  - **Option 1:** The JIT Compiler converts the Java program into machine equivalent
  - **Option 2:** The Java Virtual Machine1(JVM) interprets the program for the native operating system
  - **Option 3:** The compiler is identical to a C++ compiler
  - **Option 4:** The APIs do all the work
- Question 2: Java Compiler compiles the source code into ___ code, which is interpreted by ___ to produce Native Executable code.

Review Question

- Question 3: Which of the following are true about JVM?
  - **Option 1:** JVM is an interpreter for byte code
  - **Option 2:** JVM is platform dependent
  - **Option 3:** Java programs are executed by the JVM
  - **Option 4:** All the above is true
- Question 4 : _____ allows a Java program to perform multiple activities in parallel.
  - **Option 1:** Java Beans
  - **Option 2:** Swing
  - **Option 3:** Multithreading
  - **Option 4:** None of the above