

Java Day 1

Download JDK and Maven and Eclipse/STS

Types of Programming Languages

- Binary
 - Lowest level
 - Not actually written
 - 0s and 1s
- Assembly
 - Language used by the processor (CPU) to generate binary.
- Compiled Languages
 - Written in plain text so they need to be transformed into another form that can be directly used by the CPU (Assembly) or another application (interpreted language)
- Interpreted / Scripting Languages
 - Treated as a series of instructions by other software, which in turn generates Assembly from it.
 - Generally, interpreted languages are not human-readable, but scripting languages are
- Markup Languages
 - Used by another application to give context or to **describe** static content.
 - **Not a programming language**

Java Notes

Background / High Level

Java is very OOP (Object Oriented Programming). This is by design.

- Java was going for Scalability.
 - Python => readability
 - JavaScript => flexibility
- Java is not flexible. Forces into good patterns.
- Java runs on the JVM (Java Virtual Machine)
 - allows any Java program to run consistently on any device that has a JVM
- Java has **massive** ecosystem of software and support.
 - Has great frameworks (Spring)

Core Features

- Automatic Memory Management (garbage collection)
 - developers are not responsible for managing memory (like in C).
- Object Oriented

- Classes and Interfaces
 - Objects and Methods
- Strongly and statically typed
 - Strongly => a variable cannot change its type once it has been assigned
 - Statically => a variable's type must be declared when created
- Compiled Language
 - source code is written into a `.java` file
 - human-readable text
 - this compiles into a `.class` file
 - Java byte code to be read by a machine (not meant for humans)

JDK, JRE, JVM

- **JDK:** Java Development Kit
 - software development for developing Java applications
 - *aka a kit (or package) that provides the environment to **develop** and **execute (run)** Java programs*
 - Includes:
 - JRE
 - interpreter/loader (java)
 - compiler (javac)
 - other tools needed in Java Development
- **JRE:** Java Runtime Environment (*sometimes JRTE*)
 - provides the minimum requirements for executing a Java application
 - *aka provides environment the **run (and only run - NOT develop)** Java programs*
 - Consists of:
 - JVM
 - core libraries, classes, and supporting files
- **JVM:** Java Virtual Machine
 - instance of the JRE at runtime
 - WORA (Write Once, Run Anywhere)
 - any Java program will work the same on any device with a JVM

Code!