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 environemtn 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!