Author: Vivekananthan Pasupathi
pvivekdev@gmail.com
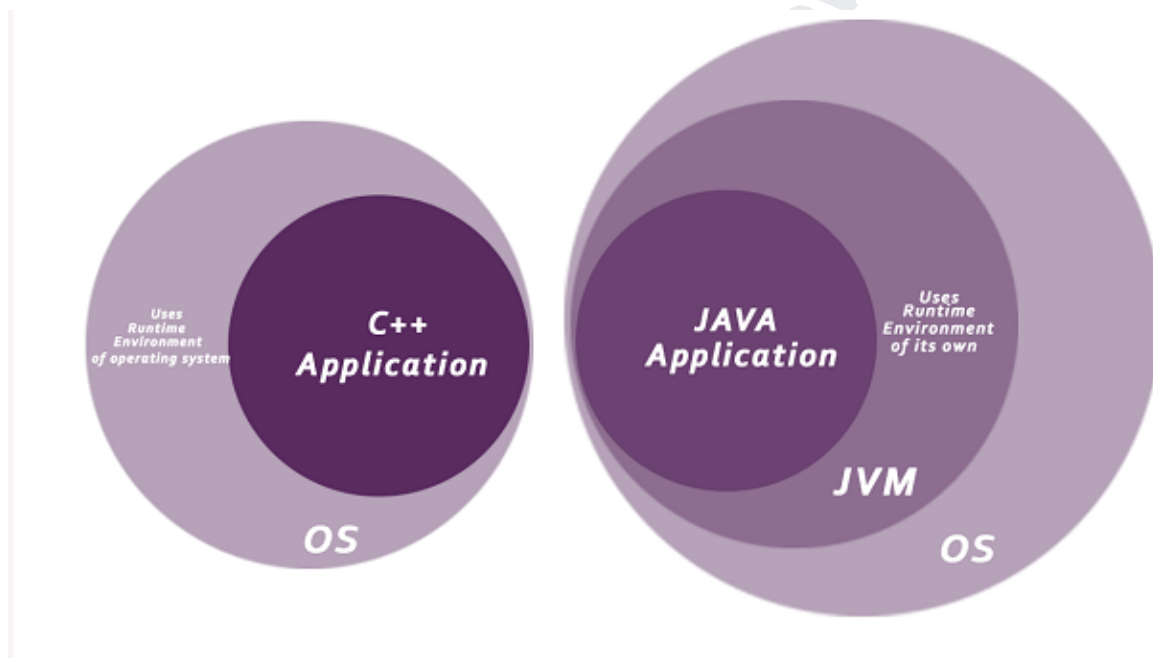Github: https://github.com/pvivekdev/CalculatorUsingJava.git

JAVA

JAVA is an **interpreted language**,

What does that mean? To understand this let know the difference between
Compiled language vs interpreted language

Compiled languages - e.g C, C++, GO, Rust - These are directly converted into machine code without need of any interpreter in the middle.

Interpreted language - eg. JAVA, Python, JAVA Script, .NET. All these require an interpreter in the middle to read the code and then executes into the target machine using JIT (Just in Time compilation) comes into picture to convert the code line by line.

JAVA uses both compiler and interpreter. It first compiles the java code into bytecode and then the interpreter loads the bytes code into the runtime environment (JRE) that is present inside the JVM.

C, C++ is compiled into machine specific Where JAVa is platform independent since it executes inside the JVM (JAVA Virtual Machine)

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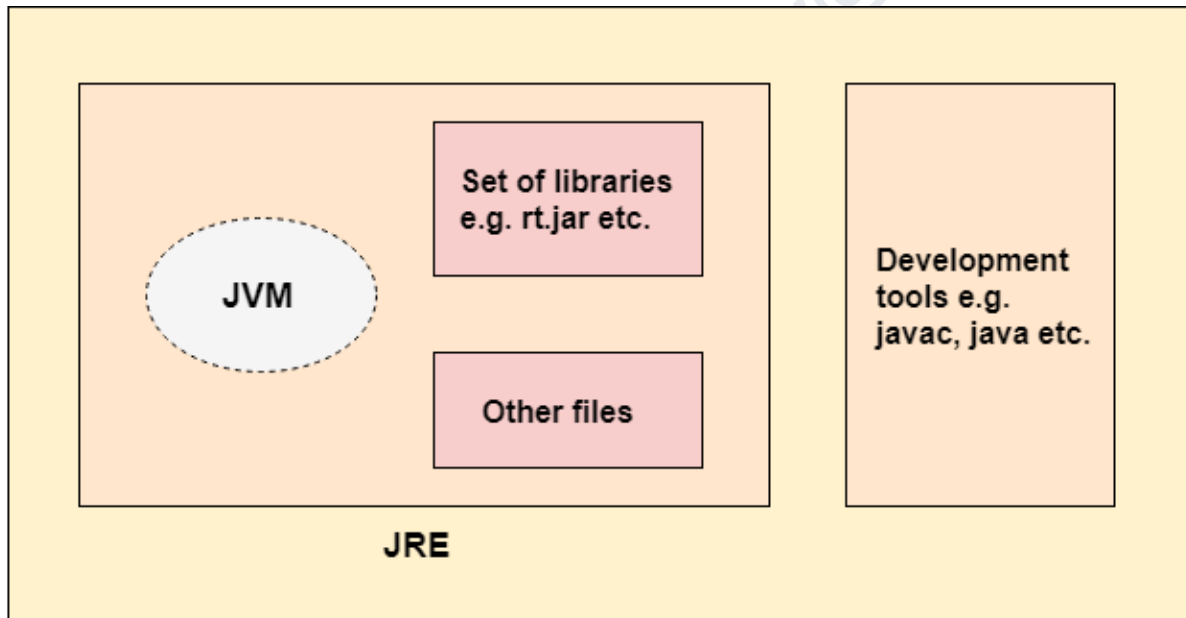
JAVA execution flow:

 A JAVA code <SimpleCalculator.java> —> note the extension of the file ends with .java Converted into java class using java compiler compiler.

JAVa compiler present inside the JRE . JRE contains useful libraries, interpreters and compilers and also contains the JVM which is the execution place for the java runtime engine.

JDK (Java Development Kit) - It comprises JRE , JVM + Development Tool.

To step up JAVA JDK into System

Download JDK based on your OS. For example I am using Linux ubuntu so I have downloaded and installed OpenJDK

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In Linux :

Step 1:
 Download JAVA OpenJDK using cmd in terminal
 Sudo apt install default-jdk

Step 2:

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Once it is successfully installed. Check for the version using javac –version

```
Setting up ttbxt-dev.amd04 (1.1.2.1-1) ...
vivek@vivek-Vostro-15-3568:/opt$ javac --version
javac 11.0.16
vivek@vivek-Vostro-15-3568:/opt$ java --version
```

Now

JAVA is successfully installed. Compile the Calculator.java file using javac

```
vivek@vivek-Vostro-15-3568:~/Downloads/calculator/sample/src/sample$ ls
Calculator.class  Calculator.java  MathHelper.class  MathHelper.java
vivek@vivek-Vostro-15-3568:~/Downloads/calculator/sample/src/sample$ javac Calculator.java
vivek@vivek-Vostro-15-3568:~/Downloads/calculator/sample/src/sample$
```

Calculator java class is compiled successfully

Step 4:

Execute the compiled java class using cmd

```
vivek@vivek-Vostro-15-3568:~/Downloads/calculator/sample/src/sample$ java Calculator.java
--------Enter one of the input in number between 1 to 8 from given menu-------------
1 To Add Two Numbers
2 To Subtract Two Numbers
3 To Multiply Two Numbers
4 To Divide Two Numbers
5 To calculate X% of Y
6 To Find What Percentage of Y is X
7 To Find % of increase or descrease from X to Y
8 Exit
```

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Best Reference books:

https://github.com/manjunath5496/Java-Programming-Books
https://github.com/i140394/Java-Books
https://github.com/selvester69/docs
https://github.com/programmerfriend/awesome-java-books

Spring
https://github.com/wuyichen24/spring-microservices-in-action
https://github.com/srjainapur/Spring-Spring-Boot-Microservices
https://github.com/selvester69/docs

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Jar vs war

WAR extension is for web application that contains the archive of jsp pages, static pages, need tom cat server to execute this

JAR is minimum in bundle and can run directly in java runtime,

Spring Cloud , Spring JPA, Spring resilence Js Spring Logger

Choosing right size for microservice is important
1.   Domain Driven wise sizing
2.   Event Storming sizing

Lombbac - automatic getter and setter

Repository Pattern

Controller → IRepository Service → Repository Class - > JPA / ORM connection

What is the Autowired in Spring
https://www.baeldung.com/inversion-control-and-dependency-injection-in-spring

We can achieve Inversion of Control through various mechanisms such as: Strategy design pattern, Service Locator pattern, Factory pattern, and Dependency Injection (DI).

https://www.geeksforgeeks.org/singleton-and-prototype-bean-scopes-in-java-spring/

Bean - Singleton, and Prototype
Bean on Init and Destroy methods

Application context - defined by Java namespace

```
// file into IoC container
        ApplicationContext
            ap
        = new ClassPathXmlApplicationContext(
            "resources/spring.xml");
```

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12 Factors of Cloud-native applications

CQRS