Core Java

1) Components of java Development Kit

Various components :-

i) Java compiler (javac)

→ Translate java source code into bytecode (.class files)
(.java files)

ii) Java virtual machine (JVM)

→ Executes java bytecode on any platform

iii) Java Runtime Env. (JRE)

→ Provides the run time env. needed to run java applications.

iv) Java class libraries.

→ A collection of pre-written classes & interfaces., provides essential functionalities.

v) Java Development Tools.

→ provides various utilities for java development and debugging.

2) Difference b/w JDK, JVM, and

① JDK.

JDK is a complete development env. for building java applications

Components:

i) Java compiler
ii) Java debugger
iii) Java archive tool
iv) JRE
v) Documentation.

② JVM.

JVM is an abstract machine that enables a computer to run java programs. Responsible for executing bytecode generated.

③ JRE

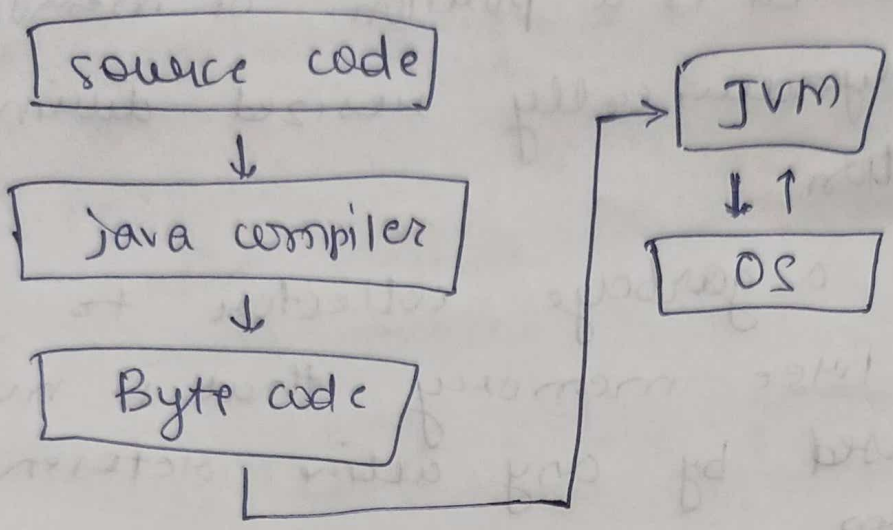
JRE provides the necessary env. to run java env.

Components:

i) JVM
ii) Core libraries
iii) Supporting files

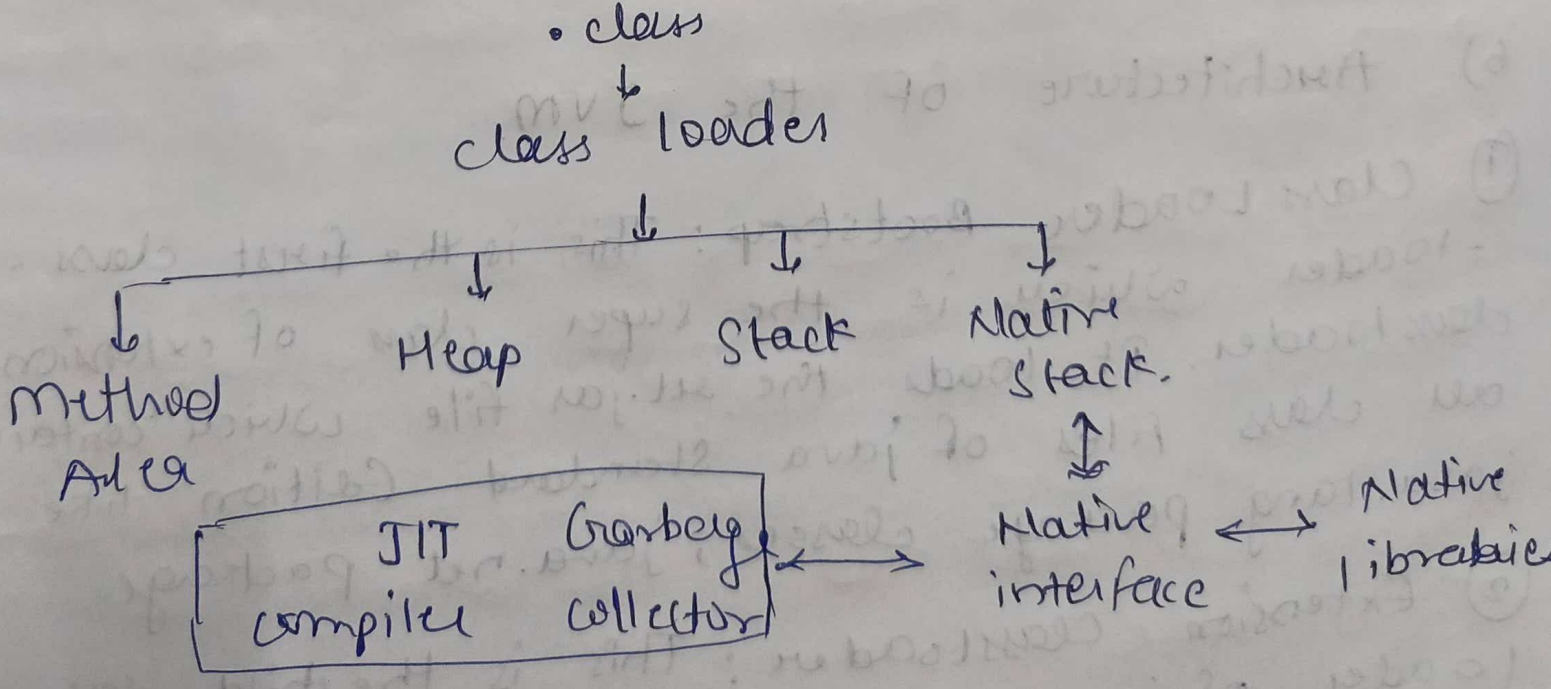
3) Role of JVM.

JVM = JRE + JDK



Jvm performs following function:

1) Loads the code
2) verifies the code
3) Executes the code
4) Provides run time env.



4) Memory Management of JVM:

The JVM allocates memory for java objects on the heap which is a portion of memory that can be dynamically resized during program execution.

The JVM uses a garbage collector to automatically free memory that is no longer being used by any active references in the program.

5) JIT compiler and its role in the JVM

The JIT compiler is a component of Java Virtual Machine that accelerates the performance of java programs. It does this by compiling the bytecode into native machine code at run time

6) Architecture of the JVM.

① Class Loader Bootstrap: This is the first class-loader which is the super class of extension class loader. It loads the rt.jar file which contains all class files of java Standard Edition like java.lang package classes, java.net package.

② Extension Classloader: This is the child class loader of Bootstrap.

③ System / Application class loader : This is the class loader of extension class loader. It loads the class files from class path

④ Heap

⑤ Stack.

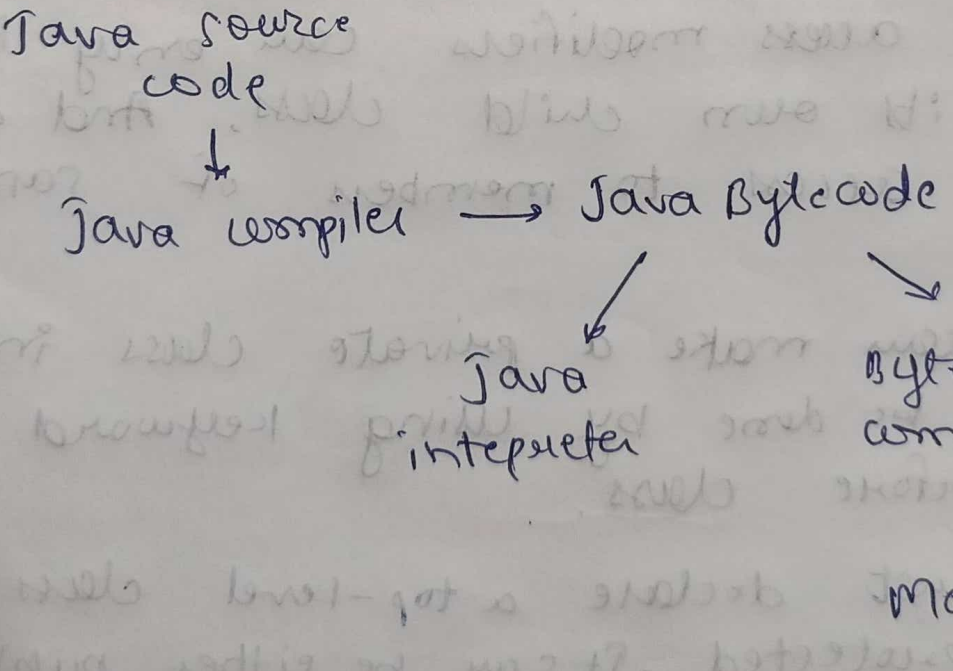
⑥ Program counter Register

⑦ Native Method Stack.

⑧ Execution Engine.

7) How does java achieve platform independence through JVM.

JAVA is platform independence, java compiled code (byte code) can run on all operating systems. The result of the java compiler is the .class file or byte code.



8) Garbage collection in Java.

Garbage collection is process of reclaiming the runtime unused memory automatically. In other words, it is a way to destroy the unused objects.

9) Access Modifiers in Java.

i) Package level Private (Default)
ii) Private - Cannot access outside the class
iii) Public - Accessed outside the class
iv) Protected. - can only be accessed by child class.

10) Same as above.

11) No, a method with a different access modifier, until and unless it is a private access modifier.

12) Protected access modifiers can only be accessed by its own child class, And default A.M. have access to members of same package.

13) Yes we can make a private class in java, and it can be done by using keyword 'private' before class.

14) No we cannot declare a top-level class as private or protected. It can be either public or default

15) If we declare a variable or method as private and try to access it, it will give compile time error.

16) Package - private or default, is can be accessed by its own members of same package.