CORE JAVA

UNIT 1 – JRE, JVM

Take Home Task - Solution

Are JVM,JDK & JRE Platform Independent? Justify your answer.

Answer:-

No. JDK,JRE & JVM are platform dependent. JDK installation file will be different for different OS.

LEARNING OUTCOMES

JAVA RUNTIME
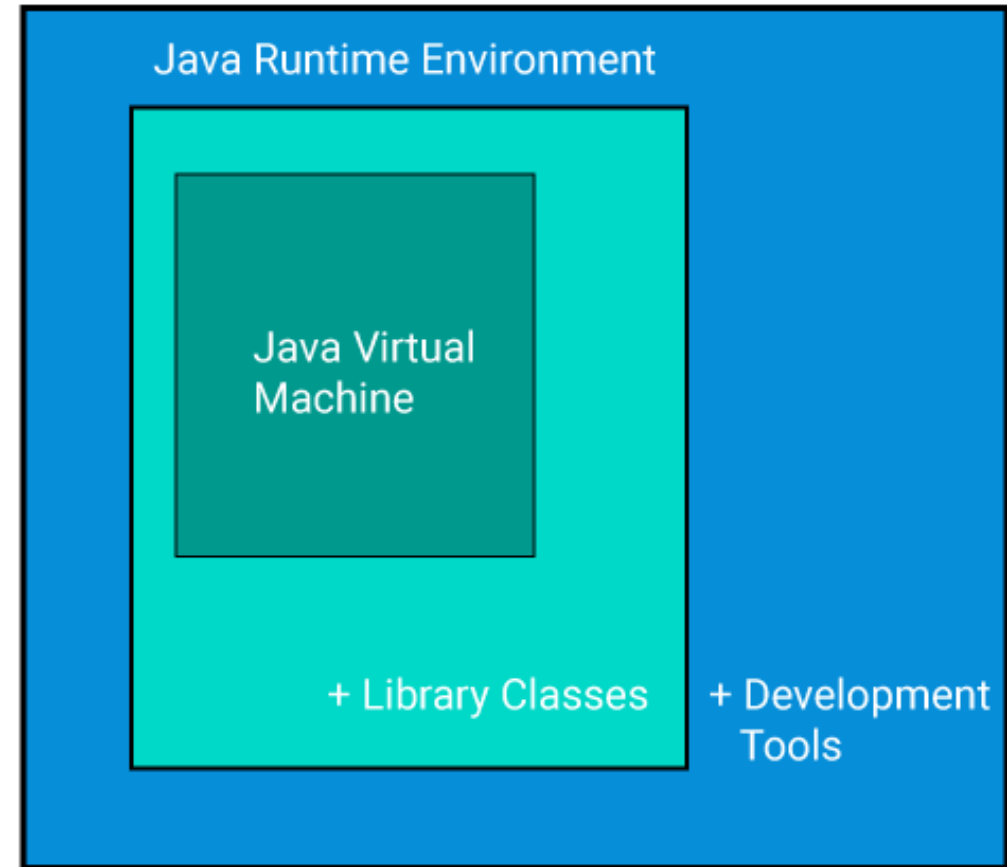ENVIRONMENT

JAVA VIRTUAL
MACHINE

JVM
COMPONENTS

JAVA RUNTIME ENVIRONMENT

- A software program needs to execute, and to do that it needs an environment to run in.

- It is a software layer that runs on top of a computer's operating system, providing additional services specific to Java.

- It loads class files and ensures there is access to memory and other system resources to run them.

- The JRE smoothens over the diversity of operating systems, ensuring that Java programs can run on virtually any OS without modification.

Components of JRE

Java Runtime Environment

Java Virtual Machine

+ Library Classes   + Development Tools

JDK = JRE + Development Tool

JRE = JVM + Library Classes

Java Virtual Machine

Is a running software system responsible for executing live Java programs.

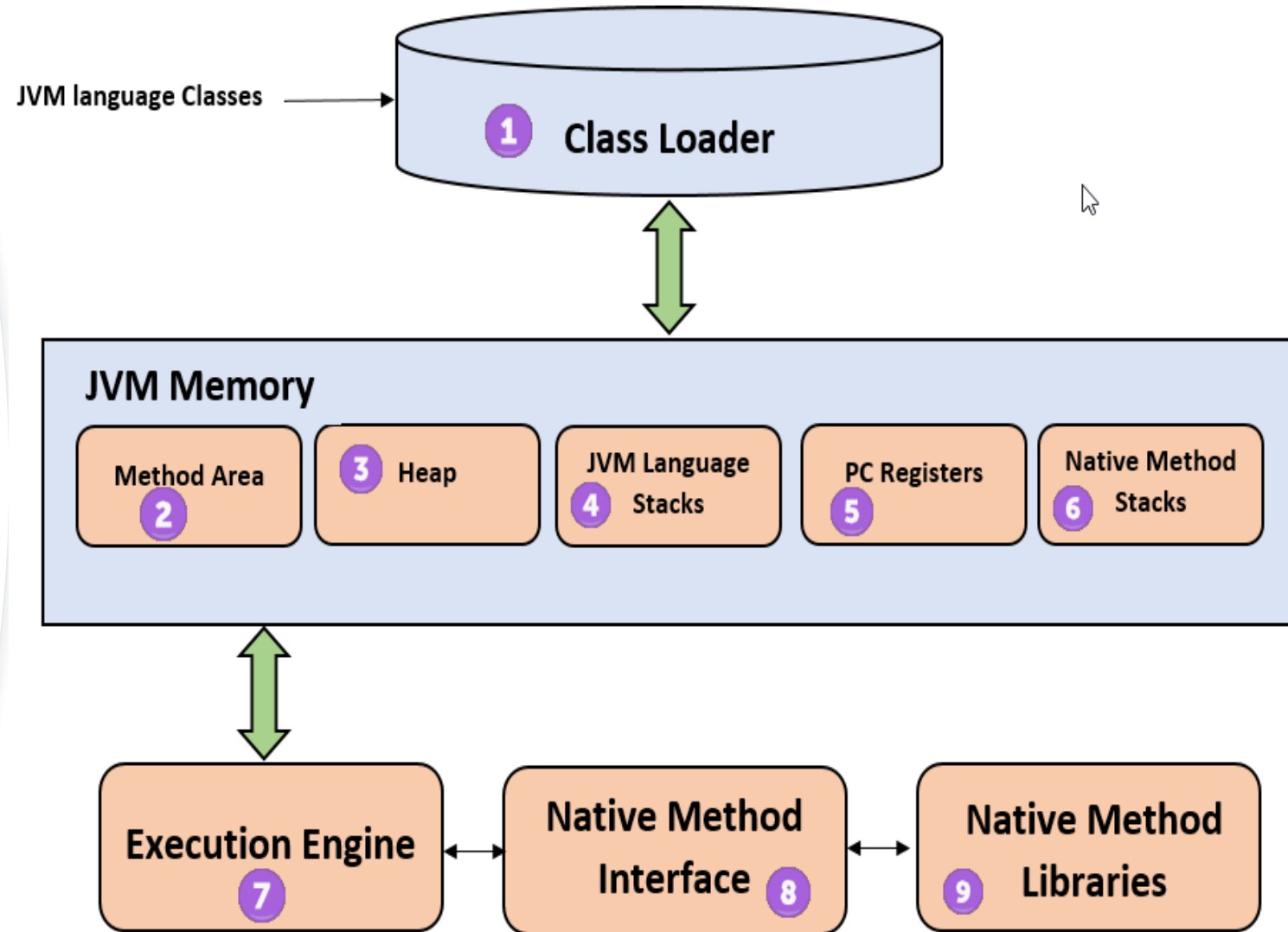Converts Java bytecode into machines language.

JVM is a part of Java Run Environment (JRE).

# Working of JVM

Working of Java Virtual Machine (JVM)

Working of JVM

Components of JVM

- **CLASS LOADER**
  - The class loader is a subsystem used for loading class files. It performs three major functions viz. Loading, Linking, and Initialization.

- **METHOD AREA**
  - JVM Method Area stores class structures like metadata, the constant runtime pool, and the code for methods.

- **HEAP**
  - All the Objects, their related instance variables, and arrays are stored in the heap. This memory is common and shared across multiple threads.

Components of JVM
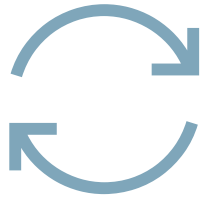
JVM LANGUAGE STACKS

Java language Stacks store local variables, and it's partial results. Each thread has its own JVM stack, created simultaneously as the thread is created.

PC REGISTERS

PC register store the address of the Java virtual machine instruction which is currently executing. In Java, each thread has its separate PC register.

NATIVE METHOD STACKS

Native method stacks hold the instruction of native code depends on the native library.

Components of JVM

- **EXECUTE ENGINE**
  - It is a type of software used to test hardware, software, or complete systems. The test execution engine never carries any information about the tested product.
  - **JIT(Just-In-Time) compiler** - It helps in improving the performance of Java applications by compiling bytecodes to machine code at run time
  - **Garbage collector** - It tracks each and every object available in the JVM heap space and removes unwanted ones.

Components of JVM

- **NATIVE METHOD INTERFACE**
  - The Native Method Interface is a programming framework. It allows Java code which is running in a JVM to call by libraries and native applications.
- **NATIVE METHOD LIBRARIES**
  - Native Libraries is a collection of the Native Libraries(C, C++) which are needed by the Execution Engine.

Difference between JDK,JRE, JVM

HELLO EVERYONE !

QUIZ

- https://share.nearpod.com/JzomV7NGZab

Take Home Task

Find different tools available in JDK. Also note down their functionality.

THANK YOU