OOPJ Assigment No. 02

DATE

1. Explain the componets of JDK.

Sol

Java developement kit consist of 3 components.

Java compiler (Java) compilor:
— Translate java source code into byte code

Java Virtual Machine (JVM)
— executes the bytecode

Java Runtime Enviornment (JRE)
— includes library and othe files necessary for running java applications

2. Difference betn JDK, JVM, and JRE

soln JDK:

It is a s/w Developement kit that includes tools for developing java applications.

JVM:

is a virtual machine that executes java bytecode

JRE:

JRE is a runtime enviorment that includes libraries and other files necessory for running java applications.

In simple terms, the JDK is for developers, the JVM is for running java pgms and JRE is used for end users who want to run java applications on their machines.

Q 3. what is role of JVM in Java?

soln The JVM, or Java virtual machine, plays a crucial role in execution of java pgms

It acts as an interpreter that translate java bytecode into machine code that can be understood and executed by underlying H/w.

Essentially the JVM serves as a bridge betn the platform independant java code and platform specific OS.

How does JVM executes java code?

soln The JVM code (executes) by first loading the bytecode generated by the java compilor.

It then interprits this bytecode line by line, translating it into machine code that can be executed by the processor.

Additionally JVM employs various optimization techniques, such as Just - in - time compilation to improve performance of java pgms during runtime.

Q 4 Explain the memory mgmt system of JVM.

soln. JVM uses a combination of automatic memory mgmt techniques, such as garbage collection, to ~~identify~~ efficiently allocate and deallocate memory for java pgms.

This helps to prevent memory leaks and optimize the performance of an application.

Q 5. What are the JIT compiler and its role in JVM?

soln. Just-in-time (JIT) is a component of the JVM that compiles java bytecode into native machine code at runtime.

This allows for improved performance by optimizing code execution based on the specific H/w and OS.

Q 6. What is bytecode and why is it Important for Java?

soln. Bytecode is the intermediate representation of java source code that is generated by java compiler.

It is platform independant and can be executed on any s/m that has JVM installed.

This makes java pgms portable and allows them to run on diff. devices without needing to be recompiled

Q7 How does the java achieve platform independance through The JVM?

soln Java achieve platform independance through JVM, which acts as an intermediary between java code and underlying OS.

The JVM interpretes the java bytecode and translate it into machine code tha ~~t~~ specific to the host s/m. allowing java pgms to run on any platform that has a compatible JVM installed.

Q8. what is the significance of class loder in java? what is the process of garbage collection in java

soln- The class loader in java is responsible for loading class into the JVM at runtime.

It plays a crucial role in the dynamic loading of the classes, which allows Java pgms to adopt to changing req. and load classes as needed.

Garbage Collection in java is the proces of automatically reclaming memory that is no longer in use by the pgm.

The JVM garbage colle. identifies and remove objects that are no longer reference by the pgm, freeing up memory for new objects to be allocated

This helps prevent memory leaks and ensure efficient memory mgmt in java pgms.