**ASSIGNMENT 1**

**Question 1:** What is the primary purpose of the Java Virtual Machine (JVM)?

* **Answer:** The JVM is a software component that interprets and executes Java bytecode, allowing Java programs to run on any platform that has a compatible JVM.

**Question 2:** Name three core features that distinguish Java from other programming languages.

* **Answer:** Three core features of Java are:
  + **Object-Oriented Programming (OOP):** Java is a fully OOP language, emphasizing the use of objects and classes.
  + **Platform Independence:** Java's bytecode can run on any platform with a compatible JVM, making it highly portable.
  + **Automatic Memory Management:** Java's garbage collector handles memory allocation and deallocation, reducing the risk of memory leaks.

**Question 3:** When choosing a JDK version, what factors should you consider?

* **Answer:** Factors to consider when choosing a JDK version include:
  + **Compatibility:** Ensure the JDK version is compatible with your project's requirements and dependencies.
  + **Features:** Check if the JDK version includes the specific features or APIs you need.
  + **Support:** Consider the level of support and bug fixes provided for the JDK version.
  + **Security:** Choose a JDK version with the latest security patches.

**Question 4:** What is the significance of the -verbose option when compiling a Java program?

* **Answer:** The -verbose option provides detailed output during the compilation process, showing information about the classes being compiled, the files being loaded, and any errors or warnings.

**Question 5:** What is bytecode, and how does it relate to the JVM?

* **Answer:** Bytecode is the intermediate language generated when a Java program is compiled. It is a platform-independent representation of the program that can be executed by the JVM.

**Question 6:** Describe the basic steps involved in writing, compiling, and running a Java program.

* **Answer:** The basic steps are:
  1. Write the Java code in a text editor or integrated development environment (IDE).
  2. Save the file with a .java extension.
  3. Compile the Java file using the javac compiler to generate the .class bytecode file.
  4. Run the .class file using the java command.

**Question 7:** What is the purpose of the javap tool?

* **Answer:** The javap tool is used to disassemble .class files, providing information about the classes, methods, fields, and bytecode instructions within them.

**Question 8:** Explain the concept of platform independence in Java.

* **Answer:** Platform independence means that Java programs can run on any platform that has a compatible JVM. This is achieved by compiling Java code into platform-independent bytecode, which is then interpreted by the JVM.

**Question 9:** What is the difference between a class and an object in Java?

* **Answer:** A class is a blueprint or template for creating objects. Objects are instances of a class and have their own state (data) and behavior (methods).

**Question 10:** Provide an example of a simple Java program that prints "Hello, World!" to the console.

Java

public class HelloWorld {

public static void main(String[] args) {

System.out.println("Hello, World!");

}

}

To compile this code use javac HelloWorld.java

To run theis code use java HelloWorld

After running these 2 cmd you will get output very successfully.