1. Describe JDK, JRE, JVM.

2. Differentiate between C, C++, JAVA.

3. Explain simple hello word program in Java. Explain compilation and

execution of java program.

4. Write java program for reading input of various data types from user

using scanner class.

5. Write a Java program to convert seconds to hour, minute and seconds.

6. Write a Java program to check if there is a 10 in a given array of integers

7. Write a program to calculate the factorial of a number. (The number is

passed as the command-line argument whose factorial we need to

calculate)

8. Write a Java Program to find transpose of Matrix.

9. Write a program to implement different types of constructors.

Describe JDK, JRE, JVM:

JDK (Java Development Kit): It is a software development kit used for developing Java applications. It includes the Java compiler, JRE, and other tools needed for Java development.

JRE (Java Runtime Environment): It provides the runtime environment for executing Java applications. It includes the JVM and libraries necessary to run Java programs, but it does not contain development tools.

JVM (Java Virtual Machine): It is an abstract computing machine that enables a computer to run Java bytecode. It provides the runtime environment in which Java bytecode can be executed.

Differentiate between C, C++, JAVA:

C is a procedural programming language, while C++ is a multi-paradigm language with support for procedural, object-oriented, and generic programming.

Java is also a multi-paradigm language like C++, but it primarily focuses on object-oriented programming.

C and C++ require manual memory management, whereas Java has automatic memory management through garbage collection.

C and C++ programs are compiled into machine-specific binary code, while Java programs are compiled into bytecode, which is then executed by the JVM.

Explain Simple Hello World Program in Java:

The "Hello, World!" program is a simple program that outputs "Hello, World!" to the console.

Compilation: To compile the program, you use the Java compiler (javac) like this: javac HelloWorld.java. This generates a bytecode file named HelloWorld.class.

Execution: To execute the compiled program, you use the Java interpreter (java) like this: java HelloWorld.

Explanation of Compilation and Execution of Java Program:

Compilation: Java source code files (with .java extension) are compiled into bytecode files (with .class extension) using the Java compiler (javac). This bytecode is platform-independent.

Execution: The Java bytecode is executed by the Java Virtual Machine (JVM). The JVM translates the bytecode into machine-specific instructions and executes them.

Coding Questions

import java.util.Scanner;

public class ass1{

public static void main(String[] args) {

// 5. Convert Seconds to Hour, Minute, and Seconds

convertSeconds();

// 6. Check if there is a 10 in a Given Array of Integers

checkForTen();

// 7. Calculate Factorial of a Number

if (args.length > 0) {

int num = Integer.parseInt(args[0]);

calculateFactorial(num);

} else {

System.out.println("Please provide a number as a command-line argument for factorial calculation.");

}

// 8. Find Transpose of Matrix

findTranspose();

// 9. Implement Different Types of Constructors

implementConstructors();

}

// Function to convert seconds to hour, minute, and seconds

public static void convertSeconds() {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the number of seconds: ");

int totalSeconds = scanner.nextInt();

int hours = totalSeconds / 3600;

int minutes = (totalSeconds % 3600) / 60;

int seconds = totalSeconds % 60;

System.out.println("Hours: " + hours);

System.out.println("Minutes: " + minutes);

System.out.println("Seconds: " + seconds);

scanner.close();

}

// Function to check if there is a 10 in a given array of integers

public static void checkForTen() {

int[] array = {1, 2, 3, 4, 5, 10};

boolean found = false;

for (int num : array) {

if (num == 10) {

found = true;

break;

}

}

System.out.println("Is there a 10 in the array? " + found);

}

// Function to calculate factorial of a number

public static void calculateFactorial(int num) {

int factorial = 1;

for (int i = 1; i <= num; i++) {

factorial \*= i;

}

System.out.println("Factorial of " + num + " is: " + factorial);

}

// Function to find transpose of a matrix

public static void findTranspose() {

int[][] matrix = {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}};

int[][] transpose = new int[3][3];

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

transpose[i][j] = matrix[j][i];

}

}

System.out.println("Original Matrix:");

printMatrix(matrix);

System.out.println("Transpose Matrix:");

printMatrix(transpose);

}

// Helper function to print a matrix

public static void printMatrix(int[][] matrix) {

for (int[] row : matrix) {

for (int num : row) {

System.out.print(num + " ");

}

System.out.println();

}

}

// Function to implement different types of constructors

public static void implementConstructors() {

// Here's a class with multiple constructors

class MyClass {

int num;

// Default Constructor

MyClass() {

num = 0;

}

// Parameterized Constructor

MyClass(int n) {

num = n;

}

// Copy Constructor

MyClass(MyClass obj) {

num = obj.num;

}

}

}

}

