**Institute of Computer Technology**

**B. Tech. Computer Science and Engineering**

**Semester: III**

**Sub: Object-Oriented Programming**

**Course Code: 2CSE303**

**Practical Number:3**

**Objective:**

To learn about condition (if, if-else, nested if-else, else-if ladder, switch case), class, object and constructor concept in java.

Q.1.Problem Definition:

Make a program to obtain length (L) and breadth (B) of a rectangle and check whether its area is greater, or perimeter is greater, or both are equal.

**Code :**

import java.util.Scanner;

public class Rectangle {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

// Input the length and breadth

int length = sc.nextInt();

int breadth = sc.nextInt();

// Calculate area and perimeter

int area = length \* breadth;

int perimeter = 2 \* (length + breadth);

// Compare area and perimeter

if (area > perimeter) {

System.out.println("Area");

System.out.println(area);

} else if (perimeter > area) {

System.out.println("Peri");

System.out.println(perimeter);

} else {

System.out.println("Equal");

System.out.println(area);

}

sc.close();

}

}

**Output :**

7

2

Peri

18

Q.2. Problem definition:

Pooja would like to withdraw Rs. X from an ATM. The cash machine will only accept the transaction if X is a multiple of 5, and Pooja's account balance has enough cash to perform the withdrawal transaction (including bank charges). For each successful withdrawal the bank charges Rs. 5. Calculate Pooja's account balance after an attempted transaction.

**Code :**

import java.util.Scanner;

public class ATMWithdrawal {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the withdrawal amount: ");

int X = scanner.nextInt();

System.out.print("Enter your initial account balance: ");

double Y = scanner.nextDouble();

double remainingBalance = calculateBalance(X, Y);

System.out.printf("Your remaining balance is: %.2f\n", remainingBalance);

scanner.close();

}

public static double calculateBalance(int X, double Y) {

if (X % 5 != 0) {

return Y; // Invalid withdrawal amount

}

double requiredBalance = X + 5;

if (Y < requiredBalance) {

return Y; // Insufficient funds

}

return Y - requiredBalance;

}

}

**Output :**

Enter the withdrawal amount: 2000

Enter your initial account balance: 5000

Your remaining balance is: 2995.00

Q.3. Make a program to obtain a number N and increment its value by 1 if the number is divisible by 4,6 and 10 otherwise decrement its value by 1.

**Code :**

import java.util.Scanner;

public class NumberIncrementDecrement {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter a number: ");

int N = scanner.nextInt();

if (N % 4 == 0 && N % 6 == 0 && N % 10 == 0) {

N++; // Increment by 1

} else {

N--; // Decrement by 1

}

System.out.println("New value of N: " + N);

scanner.close();

}

}

**Output :**

Enter a number: 60

New value of N: 61

Q.4. Compute the real roots of the equation: ax2+bx+c=0.

**Code :**

import java.util.Scanner;

public class SimpleQuadraticSolver {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Input coefficients a, b, and c

System.out.print("Enter a: ");

double a = scanner.nextDouble();

System.out.print("Enter b: ");

double b = scanner.nextDouble();

System.out.print("Enter c: ");

double c = scanner.nextDouble();

// Calculate the discriminant

double discriminant = b \* b - 4 \* a \* c;

// Determine the number of roots

if (a == 0) {

if (b == 0) {

System.out.println("No solution.");

} else {

System.out.println("One root: " + (-c / b));

}

} else if (discriminant < 0) {

System.out.println("No real roots.");

} else if (discriminant == 0) {

System.out.println("One root: " + (-b / (2 \* a)));

} else {

double root1 = (-b + Math.sqrt(discriminant)) / (2 \* a);

double root2 = (-b - Math.sqrt(discriminant)) / (2 \* a);

System.out.println("Two roots: " + root1 + " and " + root2);

}

scanner.close();

}

}

**Output :**

Enter a: -1

Enter b: 1

Enter c:

0

Two roots: -0.0 and 1.0

Q.5. Determines a student’s grade, for that, you have to write an appropriate program, which will read five subject marks from the user, and then have to find total and average marks of given five subjects. On the basis of the average marks, you have to find grade as per the following condition:

-if the average score =90% =>grade=O

-if the average score >=70% and <90%=> grade=A

-if the average score>=50% and <70% =>grade=B

-if the average score>=40% and <50% =>grade=C

-if the average score<40% =>grade=Fail

**Code :**

import java.util.Scanner;

public class GradeCalculator {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Array to store the marks of 5 subjects

int[] marks = new int[5];

int total = 0;

// Input marks for 5 subjects

System.out.println("Enter the marks for 5 subjects:");

for (int i = 0; i < 5; i++) {

System.out.print("Subject " + (i + 1) + ": ");

marks[i] = scanner.nextInt();

total += marks[i]; // Calculate total marks

}

// Calculate average marks

double average = total / 5.0;

// Determine the grade based on the average marks

String grade;

if (average >= 90) {

grade = "O";

} else if (average >= 70) {

grade = "A";

} else if (average >= 50) {

grade = "B";

} else if (average >= 40) {

grade = "C";

} else {

grade = "Fail";

}

// Display the total, average, and grade

System.out.println("Total Marks: " + total);

System.out.println("Average Marks: " + average);

System.out.println("Grade: " + grade);

scanner.close();

}

}

**Output :**

Enter the marks for 5 subjects:

Subject 1: 90

Subject 2: 92

Subject 3: 89

Subject 4: 87

Subject 5: 96

Total Marks: 454

Average Marks: 90.8

Grade: O