LAB 3

Flow of Control (Selection)

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Occurrence   :   7

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1. Write a program that stimulates a simple calculator. It reads two integers and a character. If the character is a +, the sum is printed; if it is a -, the difference is printed; if is a *, the multiplication is printed; if it is a /, the quotient is printed; and if it is a %, the remainder is printed. (Use the String.charAt(0) to return the character)

```
Enter two integer number: 30 5
Enter the operand: /
30 / 5 = 6
```

```java
import java.util.*;

public class L3Q1 {
    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);
        System.out.println("Enter two integer number: ");
            int num01 = input.nextInt();
        int num02 = input.nextInt();
        input.nextLine();
        System.out.println("Enter the operand: ");
        String operand = input.nextLine();
        char op = operand.charAt(0);

        switch(operand){
            case"+":
                System.out.println(num01 +" "+ op +" "+num02+" = "+(num01 + num02));
                break;
            case"-":
                System.out.println(num01 +" "+ op +" "+num02+" = "+(num01 - num02));
                break;
            case"*":
                System.out.println(num01 +" "+ op +" "+num02+" = "+(num01 * num02));
                break;
            case"/":
                System.out.println(num01 +" "+ op +" "+num02+" = "+((double)num01 /num02));
                break;


        }
    }
}
```

2. Generate a random integer within 0 to 5 and display the integer in word.

2 is two.

```java
import java.util.*;

public class L3Q2 {
    public static void main(String[] args) {
    Random input = new Random();
    int num01 = input.nextInt(6);
    switch(num01){
        case 0:
            System.out.println("0 is zero.");
            break;
        case 1:
            System.out.println("1 is one.");
            break;
        case 2:
            System.out.println("2 is two.");
            break;
        case 3:
            System.out.println("3 is three.");
            break;
        case 4:
            System.out.println("4 is four.");
            break;
        case 5:
            System.out.println("5 is five.");
            break;
        default:
                System.out.print("The number entered is out of range.");
    }
    }
}
```

3. Write a program that calculates the total commission receives based on the table below. The program will accept the sales volume and calculate the commission. Display the commission in two decimal places.

Sales Volume	Commission
Less than or equal to 100	5% of total sales
Greater than 100 and less than or equal to 500	7.5% of total sales
Greater than 500 and less than or equal to 1000	10% of total sales
Greater than 1000	12.5% of total sales

```java
import java.util.*;

public class L3Q3 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("Please enter the sales volume in integer: ");
        double sales = input.nextDouble();

        if (sales <= 100) {
            System.out.println("The commission is " + (5.0 / 100 * sales));
        } else if (sales > 100 && sales <= 500) {
            System.out.println("The commission is " + (7.5 / 100 * sales));
        } else if (sales > 500 && sales <= 1000) {
            System.out.println("The commission is " + (10 / 100 * sales));
        } else {
            System.out.println("The commission is " + (12.5 / 100 * sales));
        }
    }
}
```

4. Write a simple two players dice game. Each player will roll the dice twice and the player with the highest score wins the game.

```java
import java.util.*;

public class L3Q4 {
    public static void main(String[] args) {
        Random input = new Random();

        //player1 rolls twice
        int p1 = input.nextInt(7);
        int p2 = input.nextInt(7);

        //player2 rolls twice
        int p3 = input.nextInt(7);
        int p4 = input.nextInt(7);

        //player1 marks
        int m1 = p1 + p2;

        //player2 marks
        int m2 = p3 + p4;

        System.out.println("Player 1 first roll: " + p1);
        System.out.println("Player 1 second roll: " + p2);
        System.out.println("Player 1 total marks: " + m1);

        System.out.println("Player 2 first roll: " + p3);
        System.out.println("Player 2 second roll: " + p4);
        System.out.println("Player 2 total marks: " + m2);

        if (m1>m2){
            System.out.print("Player 1 get the highest score! Player 1 won the game!");
        }else{
            System.out.print("Player 2 get the highest score! Player 1 won the game!");
        }
    }
}
```

5. Cramer's rule is used to solve the linear equations.

ax + by = e, cx + dy = f;   x = (ed-bf)/(ad-bc)   y=(af-ec)/(ad-bc)

Write a program that ask the user to enter a, b, c, d, e, f. and display the result of x and y. If ad – bc is equal to 0. Display "The equation has no solution"

```java
import java.util.*;

public class L3Q4 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print("Simultaneous linear equations consists of 2 equations, ax + by = e and cx + dy = f");

        System.out.println("For equation ax + by = e, enter the values for a, b, e separated by whitespace:");
        double a = input.nextDouble();
        double b = input.nextDouble();
        double e = input.nextDouble();

        System.out.println("For equation cx + dy = f, enter the values for c, d, f separated by whitespace:");
        double c = input.nextDouble();
        double d = input.nextDouble();
        double f = input.nextDouble();

        if((a*d) - (b*c) == 0){
            System.out.println("The equation has no solution.");
        }else{
            System.out.println("x is " + (( (e*d)-(b*f) )/( (a*d)-(b*c))));
            System.out.println("y is " + (( (a*f)-(e*c) )/( (a*d)-(b*c))));
        }
        input.close();
    }
}
```

6. Write a program that asks users to enter the radius of a circle and a coordinate point (x, y). Determine whether the point is inside or outside the circle centered at (0, 0).

```java
import java.util.*;

public class L3Q6 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the radius of a circle: ");
        double radius = input.nextDouble();
        System.out.print("Enter the x-coordinate of a point: ");
        double x = input.nextDouble();
        System.out.print("Enter the y-coordinate of a point: ");
        double y = input.nextDouble();

        double h = x*x;
        double v = y*y;
        double l = Math.sqrt(h + v);

        if(l > radius){
            System.out.println("The point is outside the circle.");
        }else{
            System.out.println("The point is inside the circle.");
        }
        input.close();
    }
}
```

Link:

https://github.com/PeiHui369/Fundamentals-Of-Programming/tree/main/Lab%203