LAB 2

Flow of Control (Repetition)

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Occurrence : 7

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1. Write a program that convert the temperature in degree Fahrenheit to degree Celsius. The program will display the degree Celsius in two decimal places.

   Celsius = (Fahrenheit – 32) / 1.8

```
import java.io.*;
import java.util.*;


public class L2Q1{
    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);
        System.out.println("Enter temperature in Fahrenheit: ");
        double Fahrenheit = input.nextDouble();
        double Celsius = (Fahrenheit - 32)/1.8;
        System.out.printf("Temperature in degree Celsius is = %.2f",Celsius);
        input.close();
    }
}
```

2. Write a program to calculate the monthly payment for car loan. The following are the inputs of the program. Output the monthly payment in two decimal places.

P	The price of the car
D	Down payment
R	Interest Rate in %
Y	Loan duration in year
M	Monthly Payment

$$M = (P - D) * (1 + R*Y/100) / (Y *12)$$

```
import java.util.*;
public class L2Q2 {
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter the price of the car: ");
        double P = input.nextDouble();
        System.out.println("Enter the down payment: ");
        double D = input.nextDouble();
        System.out.println("Enter the interest rate in % ");
        double R = input.nextDouble();
        System.out.println("Enter the loan duration in year ");
        double Y = input.nextDouble();
        double M = (P-D) * (1 + R*Y/100)/(Y*12);
        System.out.printf("Your monthly payment for car loan is: %.2f", M);
    }
}
```

3. Write a program that generates three random numbers. The range of the random number is 10 to 50. Display the three numbers, sum of the numbers and the average in two decimal places.

```
import java.util.*;

public class L2Q3 {
    public static void main(String[] args){
        Random input = new Random();

        /*
        int number01 = input.nextInt((50-10+1)+10);
        int number02 = input.nextInt((50-10+1)+10);
        int number03 = input.nextInt((50-10+1)+10);
        System.out.println("The first number is " + number01);
        System.out.println("The second number is " + number02);
        System.out.println("The third number is " + number03);
        int sum = number01 + number02 + number03;
        */

        for(int i=0; i<3; i++){
            int x = random.nextInt(bound:40)+10;
             System.out.println(x);

            sum = sum + x;}

        System.out.println("The sum is= " + sum);
        double average = sum/3;
        System.out.printf("The average is= %.2f", average);
    }
}
```

4. Write a program that converts the seconds to hours, minutes and seconds.

Enter the number of seconds: 123456
123456 seconds is 34 hours, 17 minutes and 36 seconds

```
import java.util.*;

public class L2Q4 {
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter the number of seconds: ");
        double seconds = input.nextDouble();
        double hour = seconds/60/60;
        double hours = (int)seconds/60/60;
        //System.out.println(hour);
        //System.out.println(hours);
        double minute = (hour - hours)*60;
        double minutes = (int)minute;
        //System.out.println(minute);
        //System.out.println(minutes);
        double second = (minute - minutes)*60;
        double sec = (int)second;
        //System.out.println(second);
        //System.out.println(sec);
        System.out.println(seconds + " seconds is " + hours + " hours, " + minutes +
" minutes and " + sec + " seconds");
    }

}
```

```
        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. Write a program that generates one random number. The range of the random number is 0 to 10000. Display the number and the sum of all the digits in the number.

```
import java.util.*;

public class L2Q5 {
    public static void main(String[] args){
        Random input = new Random();
        int number = input.nextInt(10000);
        //System.out.println(number);
        int first = number%100000/10000;
        int second = number%10000/1000;
        int third = number%1000/100;
        int fourth = number%100/10;
        int fifth = number%10/1;
        int sum = first + second + third + fourth + fifth;
        System.out.println(sum);
    }
}
```

6. Write a program that calculates the energy needed to heat water.

Q = M * (final temperature – initial temperature) * 4184

M = Weight of water in kg
Q = Energy in joules
The temperature are in degree Celsius

```
Enter the amount of water in gram: 55500
Enter the initial temperature in Fahrenheit: 38.3
Enter the final temperature in Fahrenheit: 50.9
The energy needed is 1.625484e+06
```

```
import java.util.Scanner;

public class Main{
    public static void main(String[] args) {
                Scanner input = new Scanner(System.in);
                System.out.println("Enter the amount of water in gram: ");
                double M = input.nextDouble();
                System.out.println("Enter the initial temperature in Fahrenheit: ");
                double intTemp = input.nextDouble();
                System.out.println("Enter the final temperature in Fahrenheit: ");
                double finTemp = input.nextDouble();
                double inttTemp = (intTemp-32) *5/9;
                double finnTemp = (finTemp-32) *5/9;
                double Q = M * (finnTemp - inttTemp) * 4184;
                System.out.println("The energy needed is " + Q);
            }
        }
```

Link:

https://github.com/PeiHui369/Fundamentals-Of-Programming/tree/main/Lab%202