NAME : Nisarg Patel **PRN : 21070126060**

JAVA ASSIGNMENT ASSIGNMENT-1 DATE:18-02-23

PROBLEM STATEMENT : Implement a menu-driven Java program (like fib or factorial) to implement these input methods in java (command line args, Scanner, BufferedReader, DataInputStream, Console) and Implement a simple menu driven calculator in java to implement addition , subtraction , multiplication , division , sqrt, power , mean , variance. Implement a separate Calculator class to include all related functions inside that class. (mean calculation : program reads numbers from the keyboard, summing them in the process until the user enters the string “end”. It then stops input & displays the avg. of numbers).

PROBLEM PART -1 : Implement a menu-driven Java program (like fib or factorial) to implement these input methods in java (command line args, Scanner, BufferedReader, DataInputStream, Console)

CODE:

```
/*
Problem Statement : Implement a menu-driven Java program Factorial to
                    implement these input methods in java (Scanner, Command Line args,
                    DataInputStream,BufferedReader and Console )

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LAB ASSIGNMENT - 1 CALCULATOR - PART 1 USER INPUT

*/

import java.io.*;
import java.util.Scanner;

public class UserInput
{
   public static void main(String[] args) throws IOException, ArrayIndexOutOfBoundsException
   {

      Scanner sc = new Scanner(System.in);
      int number = 0;
```

```
        // Check if a command line argument is provided
        try {
            number = Integer.parseInt(args[0]);
        } catch (Exception ignored) {
        }

        // Print menu to choose input method                    //Printing the lines for the function
        System.out.println("Menu (taking input):");
        System.out.println("1. Using cmd line");
        System.out.println("2. Using Scanner");
        System.out.println("3. Using BufferedReader");
        System.out.println("4. Using DataInputStream");
        System.out.println("5. Using Console");
        System.out.println("6. Exit");

        System.out.print("Inputing the user choice :");    // Asking for the user input.

        int choice = new Scanner(System.in).nextInt() ;   // Asking fot the choices for the swtich
case scenario

        Input input = new Input();


        // Choose input method based on user's choice
        switch (choice) {
            case 1:

                System.out.println("Using Command line");   // Command Line used
                System.out.print("Enter the number :");

                break;
            case 2:
                System.out.println("Using Scanner");  // Scanner Used
                System.out.print("Enter the number :");

                number = input.usingScanner();
                break;
            case 3:
                System.out.println("Using BufferedReader");   // BufferReader used
                System.out.print("Enter the number :");

                number = input.usingBufferedReader();
                break;
```

```
            case 4:
                System.out.println("Using DataInputStream");  //DataInputStream used
                System.out.print("Enter the number :");

                number = input.usingDataInputStream();
                break;
            case 5:
                System.out.println("Using Console");      //Console used
                System.out.print("Enter the number :");

                number = input.usingConsole();
                break;
            case 6:
                System.out.println("Exitting ..."); //Exit command
                System.exit(0);
                break;
            default:
                System.out.println("Invalid choice. Please try again.");  //Wrong choice
                break;
        }


        // Calculating the factorial
        int output = factorial(number);             //factorial call
        // Print the result
        System.out.println("Factorial " + number + ":" + output);
    }

    // Factorial function (ternary operator)
    static int factorial(int a) {
        return a == 0 ? 1 : a * factorial(a - 1);
    }
}

class Input
{
    // using Scanner
    int usingScanner ()
    {
        return new Scanner(System.in).nextInt() ;

    }

    // using BufferedReader
```

```
    int usingBufferedReader () throws IOException
    {

        BufferedReader reader = new BufferedReader(new InputStreamReader(System.in)) ;
        return Integer.parseInt(reader.readLine()) ;
    }

    // using DataInputStream
    int usingDataInputStream () throws IOException
    {
        // Create data input stream

        DataInputStream dis = new DataInputStream(System.in);
        return (dis.readInt());
    }

    // using Console
    int usingConsole ()
    {

        Console console = System.console();
        return Integer.parseInt(console.readLine());
    }

}
```

OUTPUT :

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```
PS E:\SEM-4\src> javac UserInput.java
PS E:\SEM-4\src> java UserInput 8
Menu (taking input):
1. Using cmd line
2. Using Scanner
3. Using BufferedReader
4. Using DataInputStream
5. Using Console
6. Exit
Inputing the user choice :1
Using Command line
Enter the number :Factorial 8:40320
```

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2022.3.1\lib\idea_rt.jar=51385:C:\Program Files\JetBrains\Intel
Menu (taking input):
1. Using cmd line
2. Using Scanner
3. Using BufferedReader
4. Using DataInputStream
5. Using Console
6. Exit
Inputing the user choice :2
Using Scanner
Enter the number :10
Factorial 10:3628800

Process finished with exit code 0
```

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2022.3.1\lib\idea_rt.jar=51389:C:\Program Files\JetBrains\Intel
Menu (taking input):
1. Using cmd line
2. Using Scanner
3. Using BufferedReader
4. Using DataInputStream
5. Using Console
6. Exit
Inputing the user choice :3
Using BufferedReader
Enter the number :10
Factorial 10:3628800

Process finished with exit code 0
```

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2022.3.1\lib\idea_rt.jar=51470:C:\Program Files\JetBrains\Intel
Menu (taking input):
1. Using cmd line
2. Using Scanner
3. Using BufferedReader
4. Using DataInputStream
5. Using Console
6. Exit
Inputing the user choice :4
Using DataInputStream
Enter the number :10
Factorial 10:3628800

Process finished with exit code 0
```

PROBLEM PART - 2 : Implement a simple menu driven calculator in java to implement addition, subtraction , multiplication , division , sqrt, power, mean,

variance. Implement a separate Calculator class to include all related functions inside that class. (mean calculation : program reads numbers from the keyboard, summing them in the process until the user enters the string “end”. It then stops input & displays the avg. of numbers).

CODE :

```
/*

Problem Statement : Implement a simple menu driven calculator in java to implement add, sub, mul, div, sqrt, power,
                    mean, variance. Implement a separate Calculator class to include all related function inside that
                    class. (mean calculation : program reads numbers from the keyboard, summing them in the process
                    until the user enters the string “end”. It then stops input & displays the avg. of numbers)

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Lab Assignment 1 - Part 2

*/

//Importing
import java.util.Scanner;


//Main class
public class SimpleCalculator
{
   public static void main(String[] args)            //Main method
   {
      Calculator calculator = new Calculator() ;         //Object class of calculator
      calculator.calculation();                       //Method calling of calculation()
   }
}


// Creating the class calculator
class Calculator {
   void calculation()                                  // Method calculation()
   {
      Scanner sc = new Scanner(System.in);
```

```
while (true)
{
   System.out.println("Menu:");                          // Calling the Menu
   System.out.println("1. Addition");
   System.out.println("2. Subtraction");
   System.out.println("3. Multiplication");
   System.out.println("4. Division");
   System.out.println("5. Square Root");
   System.out.println("6. Power");
   System.out.println("7. Mean");
   System.out.println("8. Variance");
   System.out.println("9. Exit");
   System.out.print("Enter your choice: ");
   int choice = sc.nextInt();

   switch (choice)                                       //Making the switch cases
   {
      case 1:                                            //Switch Case Addition
         System.out.print("Enter first number: ");
         double num1 = sc.nextDouble();
         System.out.print("Enter second number: ");
         double num2 = sc.nextDouble();
         System.out.println("Result: " + (num1 + num2));
         break;
      case 2:                                            //Switch case Subtraction
         System.out.println("Subtraction");
         System.out.print("Enter first number: ");
         num1 = sc.nextDouble();
         System.out.print("Enter second number: ");
         num2 = sc.nextDouble();
         System.out.println("Result: " + (num1 - num2));
         break;
      case 3:                                            //Switch case Multiplication
         System.out.println("Multiplication");
         System.out.print("Enter first number: ");
         num1 = sc.nextDouble();
         System.out.print("Enter second number: ");
         num2 = sc.nextDouble();
         System.out.println("Result: " + (num1 * num2));
         break;
      case 4:                                            // Switch case Division
         System.out.println("Division");
         System.out.print("Enter first number: ");
```

```
            num1 = sc.nextDouble();
            System.out.print("Enter second number: ");
            num2 = sc.nextDouble();
            System.out.println("Result: " + (num1 / num2));
            break;
        case 5:                                         // Swtich case Square Root
            System.out.println("Square Root");
            System.out.print("Enter number: ");
            num1 = sc.nextDouble();
            System.out.println("Result: " + Math.sqrt(num1));
            break;
        case 6:                                         // Switch case Power
            System.out.println("Power");
            System.out.print("Enter base: ");
            num1 = sc.nextDouble();
            System.out.print("Enter exponent: ");
            int exponent = sc.nextInt();
            System.out.println("Result: " + Math.pow(num1, exponent));
            break;
        case 7:                                          // Switch case Mean
            System.out.println("Mean");
            double sum = 0;
            int count = 0;
            String input;
            System.out.println("Enter numbers one by one, enter 'end' to stop input:");
            while (true) {
                input = sc.next();
                if (input.equalsIgnoreCase("end")) {
                    break;
                }
                sum += Double.parseDouble(input);
                count++;
            }
            System.out.println("Mean: " + (sum / count));
            break;
        case 8:                                           // Switch case Variance
            System.out.println("Variance");
            sum = 0;
            count = 0;
            double mean = 0;
            double variance = 0;
            System.out.println("Enter numbers one by one, enter 'end' to stop input:");
            while (true) {
                input = sc.next();
```

```
                if (input.equalsIgnoreCase("end")) {
                    break;
                }
                double num = Double.parseDouble(input);
                sum += num;
                count++;
            }
            mean = sum / count;
            sc = new Scanner(System.in);
            System.out.println("Enter numbers one by one, enter 'end' to stop input:");
            while (true) {
                input = sc.next();
                if (input.equalsIgnoreCase("end")) {
                    break;
                }
                double num = Double.parseDouble(input);
                variance += Math.pow((num - mean), 2);
            }
            variance = variance / count;
            System.out.println("Variance: " + variance);
            break;
        case 9:                                          // swtich case exit
            System.out.println("Exiting...");
            System.exit(0);
            break;
        default:                                         // Mentioning the case for the Invalid
Choice
            System.out.println("Invalid choice!");
            break;
        }
    }
  }
}
```

OUTPUT :

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```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2022.3.1\lib\idea_rt.jar=51483:C:\Program Files\JetBrains\Intel
Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Square Root
6. Power
7. Mean
8. Variance
9. Exit
Enter your choice: 1
Enter first number: 10
Enter second number: 20
Result: 30.0
```

```
Enter your choice: 2
Subtraction
Enter first number: 20
Enter second number: 10
Result: 10.0
```

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2022.3.1\lib\idea_rt.jar=51515:C:\Program Files\JetBrains\Intel
Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Square Root
6. Power
7. Mean
8. Variance
9. Exit
Enter your choice: 3
Multiplication
Enter first number: 10
Enter second number: 20
Result: 200.0
```

```
Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Square Root
6. Power
7. Mean
8. Variance
9. Exit
Enter your choice: 4
Division
Enter first number: 10
Enter second number: 2
Result: 5.0
```

```
Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Square Root
6. Power
7. Mean
8. Variance
9. Exit
Enter your choice: 5
Square Root
Enter number: 4
Result: 2.0
```

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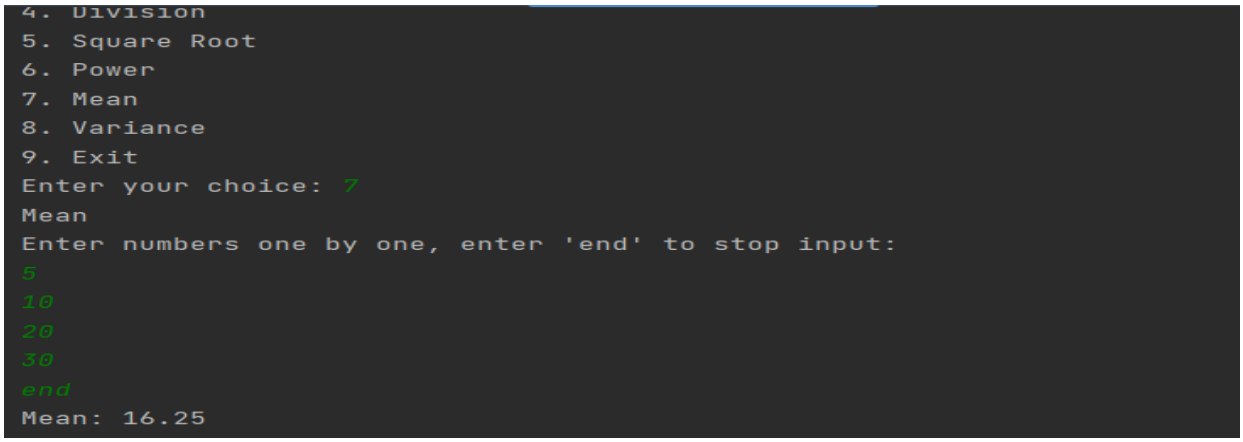

GitHub Repository:https://github.com/SnakeEyes1308/Java-Assignment-/tree/main/LAB-1

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