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ASSIGNMENT 1

Part-1

Fibonacci Series

```
/* Rajhans More
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// fibonaaci.java

import java.io.*;
import java.util.* ;
public class Fibonaaci{
public static void main(String args[]){
// command line arguments
/*
Scanner sc=new Scanner(System.in);
int number =  sc.nextInt();
*/
int number = Integer.parseInt(args[0]);

// buffered reader is primarily used for file handling
/*BufferedReader reader = new BufferedReader (new InputStreamReader(System.in));
try{
```

```
int number = Integer.parseInt(reader.readLine());

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

System.out.println(fibonaccialgo(i)+ " ");
}
}
catch(IOException e){
System.out.println(e);
}          */
}
   // fibonacci series
public static int fibonaccialgo(int number){

if(number<=1){
return number ;

}
else{
return fibonaccialgo(number-1) + fibonaccialgo(number-2);
}
}
}
```

OUTPUTS:

1) USING BUFFERED READER

2) USING SCANNER

3) USING COMMAND LINE ARGUMENT

PART-2
CALCULATOR CODE

```
// Name: Rajhans More
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public class Main {
    public static void main(String[] args) {
        // Create an instance of UserInput and Calculator
        UserInput userInput = new UserInput();
        Calculator calculator = new Calculator();

        // Perform operations based on user input
        double[] numbers = userInput.inputNumbers(2); // Adjust the count as needed

        // Extracting numbers for individual operations
        double num1 = numbers[0];
        double num2 = numbers[1];

        // Addition
        System.out.println("Sum: " + calculator.addition(num1, num2));

        // Subtraction
        System.out.println("Difference: " + calculator.subtraction(num1, num2));

        // Multiplication
        System.out.println("Product: " + calculator.multiplication(num1, num2));

        // Division
        System.out.println("Quotient: " + calculator.division(num1, num2));

        System.out.println("\n\n");

        // Sum of array
        double[] numbersArray = userInput.inputNumbers(5); // Adjust the count as needed
        System.out.println("Sum of array: " + calculator.sumOfArray(numbersArray));
```

```
        // Variance of array
        System.out.println("Variance of array: " + calculator.varianceOfArray(numbersArray));

        // Standard deviation of array
        System.out.println("Standard Deviation of array: " +
calculator.standardDeviationOfArray(numbersArray));
    }
}

// UserInput.java
import java.util.*;

public class UserInput {
    public double[] inputNumbers(int count) {
        Scanner sc = new Scanner(System.in);
        double[] numbers = new double[count];

        for (int i = 0; i < count; i++) {
            System.out.println("Enter number  " + (i + 1) + ": ");
            numbers[i] = sc.nextDouble();
        }

        return numbers;
    }
}

//Calculator.java
public class Calculator {
    // Addition
    public double addition(double num1, double num2) {
        return num1 + num2;
    }

    // Subtraction
    public double subtraction(double num1, double num2) {
        return num1 - num2;
    }

    // Multiplication
    public double multiplication(double num1, double num2) {
        return num1 * num2;
    }
```

```
    // Division
    public double division(double num1, double num2) {
        if (num2 != 0) {
            return num1 / num2;
        } else {
            throw new ArithmeticException("Cannot divide by zero");
        }
    }

    // Sum of array
    public double sumOfArray(double[] numbersArray) {
        double sum = 0;
        for (double num : numbersArray) {
            sum += num;
        }
        return sum;
    }

    // Variance of array
    public double varianceOfArray(double[] numbersArray) {
        double mean = sumOfArray(numbersArray) / numbersArray.length;
        double sumOfSquaredDifferences = 0;

        for (double num : numbersArray) {
            sumOfSquaredDifferences += Math.pow(num - mean, 2);
        }

        return sumOfSquaredDifferences / numbersArray.length;
    }

    // Standard deviation of array
    public double standardDeviationOfArray(double[] numbersArray) {
        return Math.sqrt(varianceOfArray(numbersArray));
    }
}
```

OUTPUT:

```
Enter number  1:
23
Enter number  2:
45
Sum: 68.0
Difference: -22.0
Product: 1035.0
Quotient: 0.5111111111111111



Enter number  1:
3
Enter number  2:
4
Enter number  3:
5
Enter number  4:
6
Enter number  5:
7
Sum of array: 25.0
Variance of array: 2.0
Standard Deviation of array: 1.4142135623730951
```