ASSIGNMENT NO.8

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Batch: AIML B1

Title: Calculator and Fibonnaci

1. Main.java

```
// Name : Neil Cardoz
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// Batch : AIML B1 23-27


public class Main {

    public static void main(String[] args) {
        // Creating an object of UserInput to display the menu
        UserInput userInput = new UserInput();

        // Creating an object of Calculator to perform operations
```

```
        Calculator calc = new Calculator();

        // Display the menu to the user
        userInput.displayMenu();
    }
}
```

2. UserInput.java

```
import java.util.Scanner;

class UserInput {

    // Method to take two integer inputs from the user and return them
as an array
    int[] userInput() {
        int[] numbers = new int[2];
        Scanner scan = new Scanner(System.in);

        System.out.println("Enter 1st Number:");
        numbers[0] = scan.nextInt();

        System.out.println("Enter 2nd Number:");
```

```
    numbers[1] = scan.nextInt();

    return numbers;
}

// Method to take an array of numbers input from the user
int[] userArrInput() {
    int a;
    Scanner scan = new Scanner(System.in);

    System.out.println("Enter the length of the array:");
    a = scan.nextInt();

    int[] ar = new int[a];

    for (int i = 1; i <= a; i++) {
        System.out.println("Enter Number " + i + ":");
        ar[i - 1] = scan.nextInt();
    }

    return ar;
}
```

```
    // Method to display the menu and perform operations based on user
choice
    void displayMenu() {
        Scanner scan = new Scanner(System.in);

        System.out.println("\nSelect the operation:");
        System.out.println("1. Addition");
        System.out.println("2. Subtraction");
        System.out.println("3. Multiplication");
        System.out.println("4. Division");
        System.out.println("5. Fibonacci Sequence");
        System.out.println("6. Mean of an Array");
        System.out.println("7. Variance of an Array");

        int choice = scan.nextInt();

        // Create a new Calculator object to perform operations
        Calculator calc = new Calculator();

        switch (choice) {
            case 1:
                int[] addNumbers = userInput();
                System.out.println("Result of addition: " +
calc.addition(addNumbers));
                break;
```

```
            case 2:
                int[] subNumbers = userInput();
                System.out.println("Result of subtraction: " +
calc.subtraction(subNumbers));
                break;

            case 3:
                int[] mulNumbers = userInput();
                System.out.println("Result of multiplication: " +
calc.multiplication(mulNumbers));
                break;

            case 4:
                int[] divNumbers = userInput();
                System.out.println("Result of division: " +
calc.division(divNumbers));
                break;

            case 5:
                System.out.println("Enter the number of Fibonacci
terms you want:");
                int n = scan.nextInt();
                System.out.println("Fibonacci Sequence: ");
                calc.fibonacci(n);
                break;
```

```
            case 6:
                int[] arrForMean = userArrInput();
                System.out.println("Mean of the array: " +
calc.mean(arrForMean));
                break;

            case 7:
                int[] arrForVariance = userArrInput();
                System.out.println("Variance of the array: " +
calc.variance(arrForVariance));
                break;

            default:
                System.out.println("Invalid choice. Please select a
valid operation.");
                break;
        }
    }
}
```

3. Calculator.java

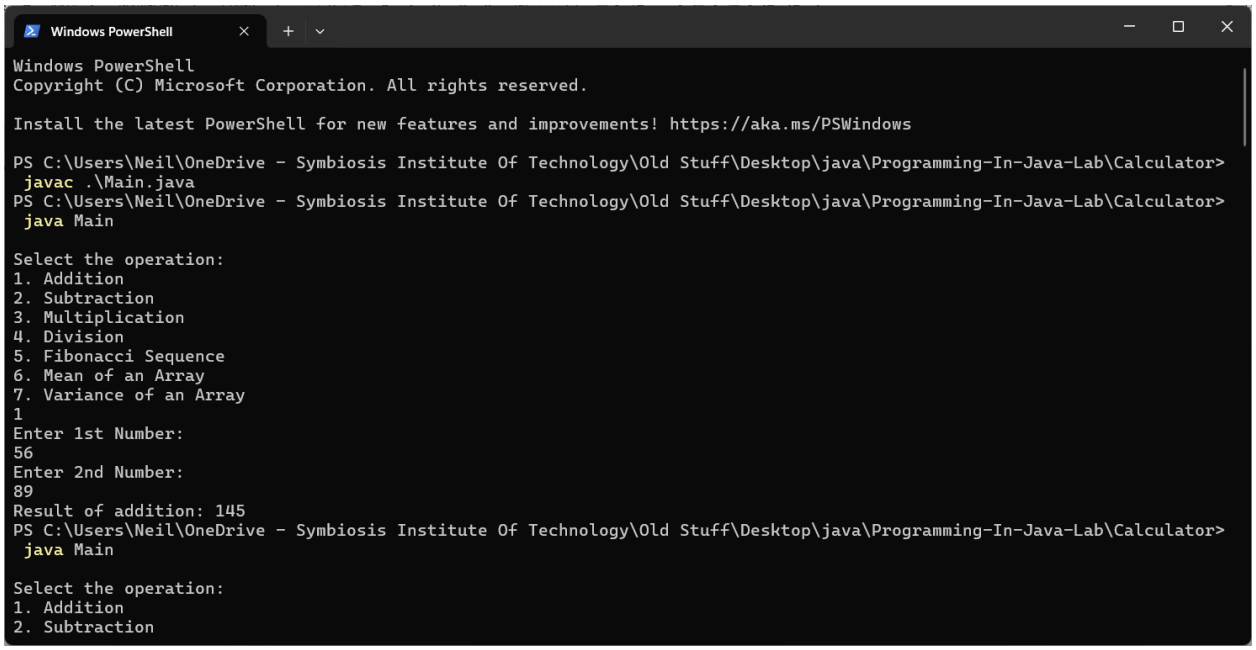
```
class Calculator {
```

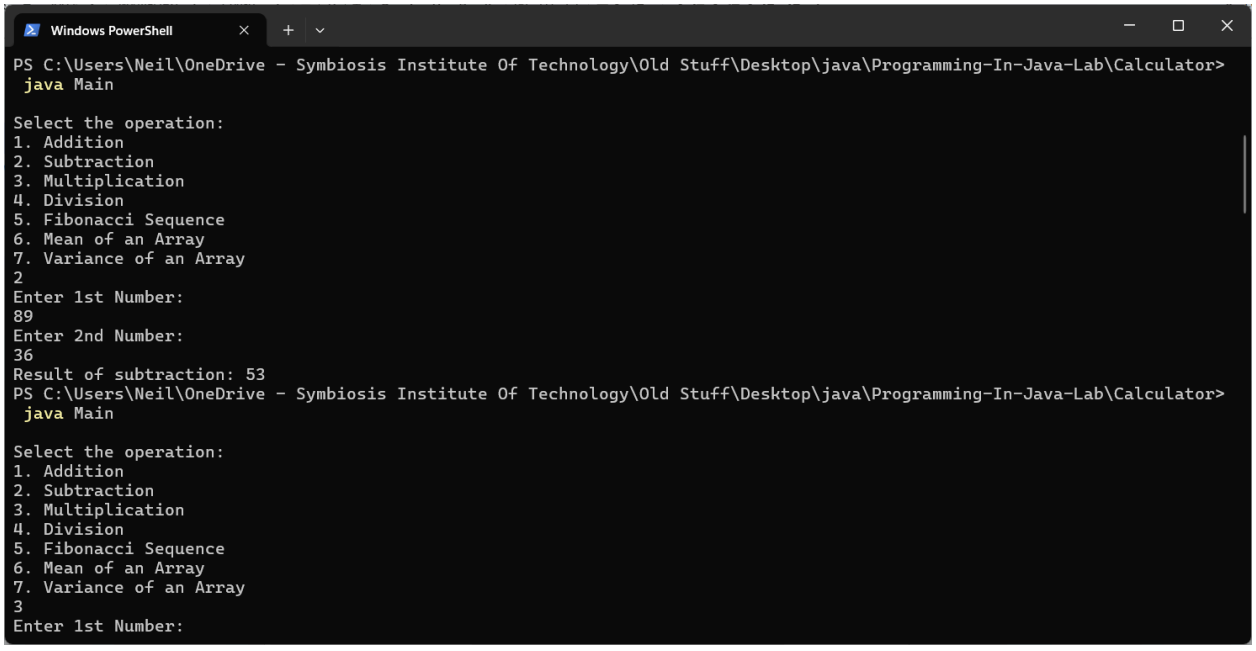
```
    // Method to perform addition
    int addition(int[] numbers) {
        return numbers[0] + numbers[1];
    }

    // Method to perform subtraction
    int subtraction(int[] numbers) {
        return numbers[0] - numbers[1];
    }

    // Method to perform multiplication
    int multiplication(int[] numbers) {
        return numbers[0] * numbers[1];
    }

    // Method to perform division
    double division(int[] numbers) {
        if (numbers[1] == 0) {
            System.out.println("Error: Division by zero is not
allowed.");
            return 0;
        }
        return (double) numbers[0] / numbers[1];
    }
```

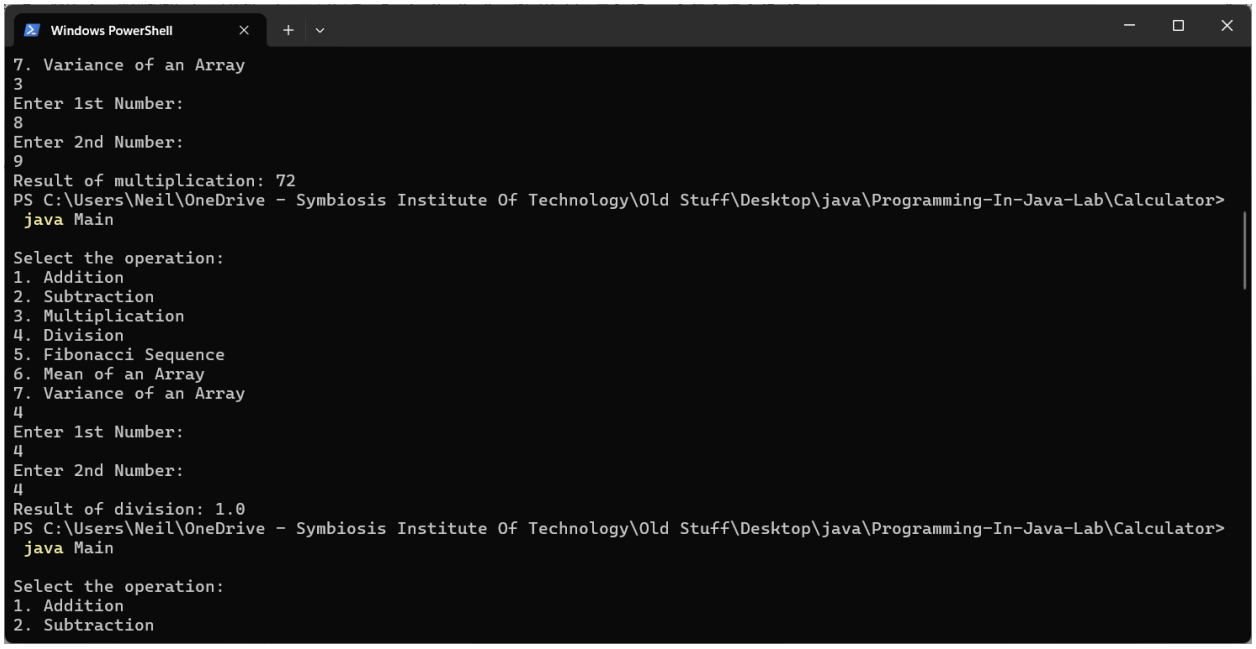
```
// Method to calculate Fibonacci sequence up to nth term
void fibonacci(int n) {
    int first = 0, second = 1;

    // Print the Fibonacci sequence up to n terms
    System.out.print(first + " " + second + " ");

    for (int i = 3; i <= n; i++) {
        int nextTerm = first + second;
        System.out.print(nextTerm + " ");
        first = second;
        second = nextTerm;
    }
    System.out.println();
}

// Method to calculate the mean of an array
double mean(int[] numbers) {
    double sum = 0;
    for (int num : numbers) {
        sum += num;
    }
    return sum / numbers.length;
```

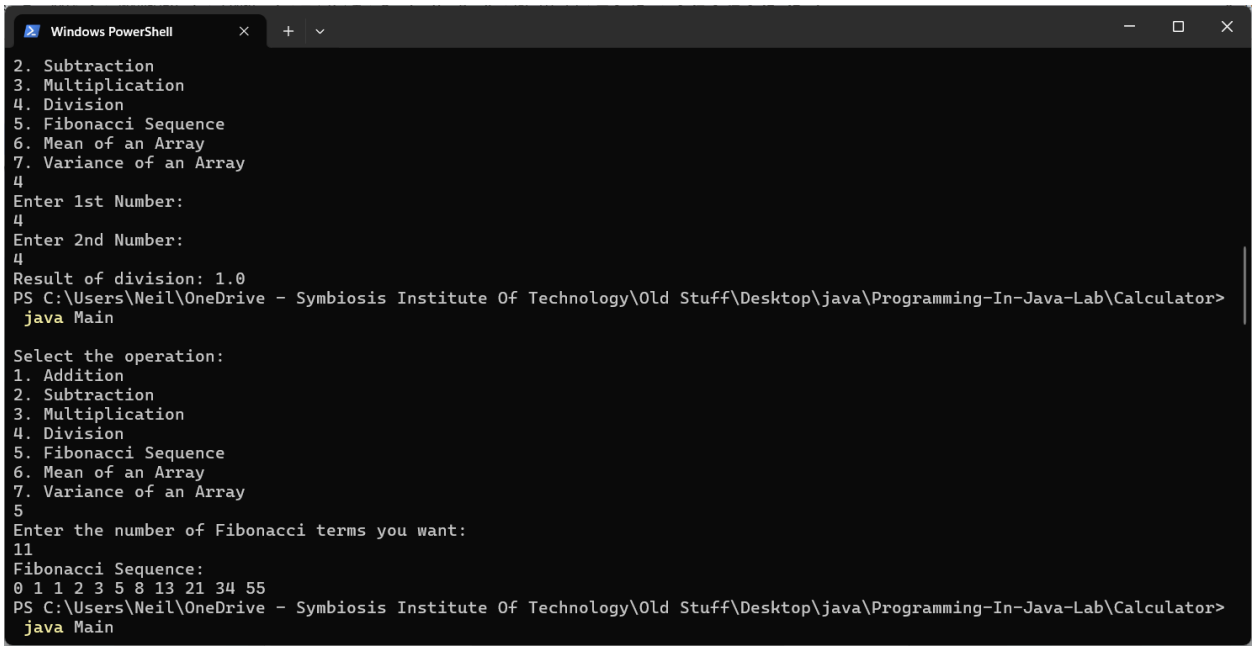
```
    }

    // Method to calculate the variance of an array
    double variance(int[] numbers) {
        double mean = mean(numbers);
        double sumOfSquares = 0;
        for (int num : numbers) {
            sumOfSquares += Math.pow(num - mean, 2);
        }
        return sumOfSquares / numbers.length;
    }
}
```

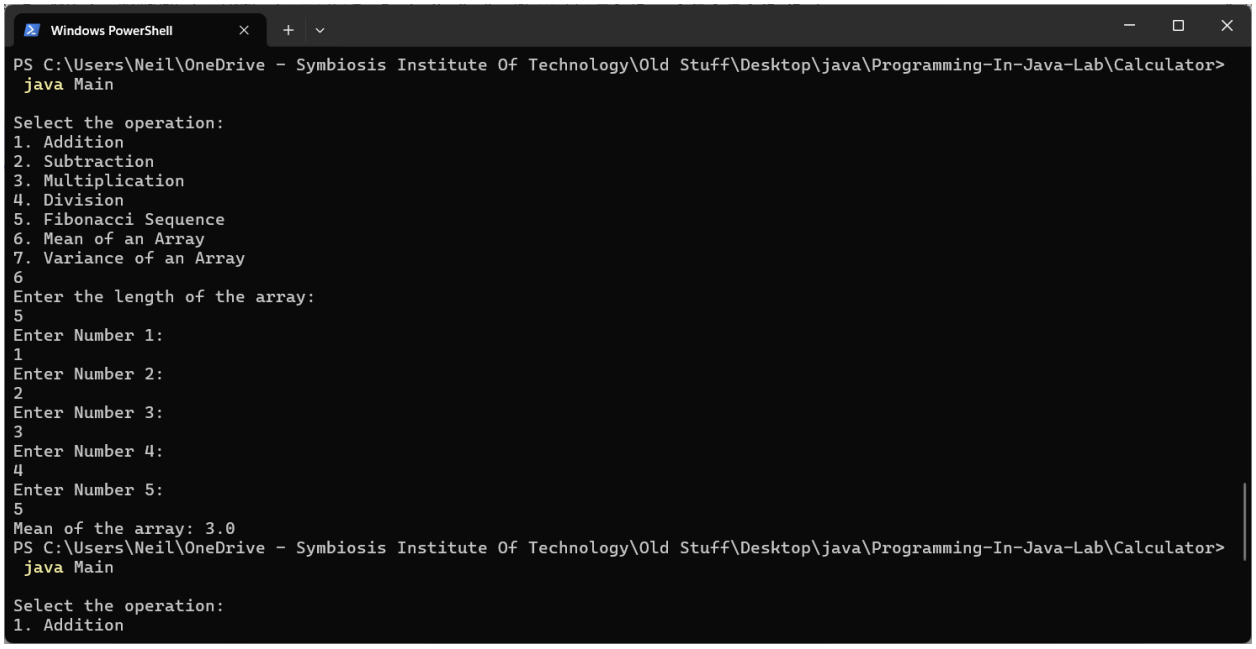
4. Output

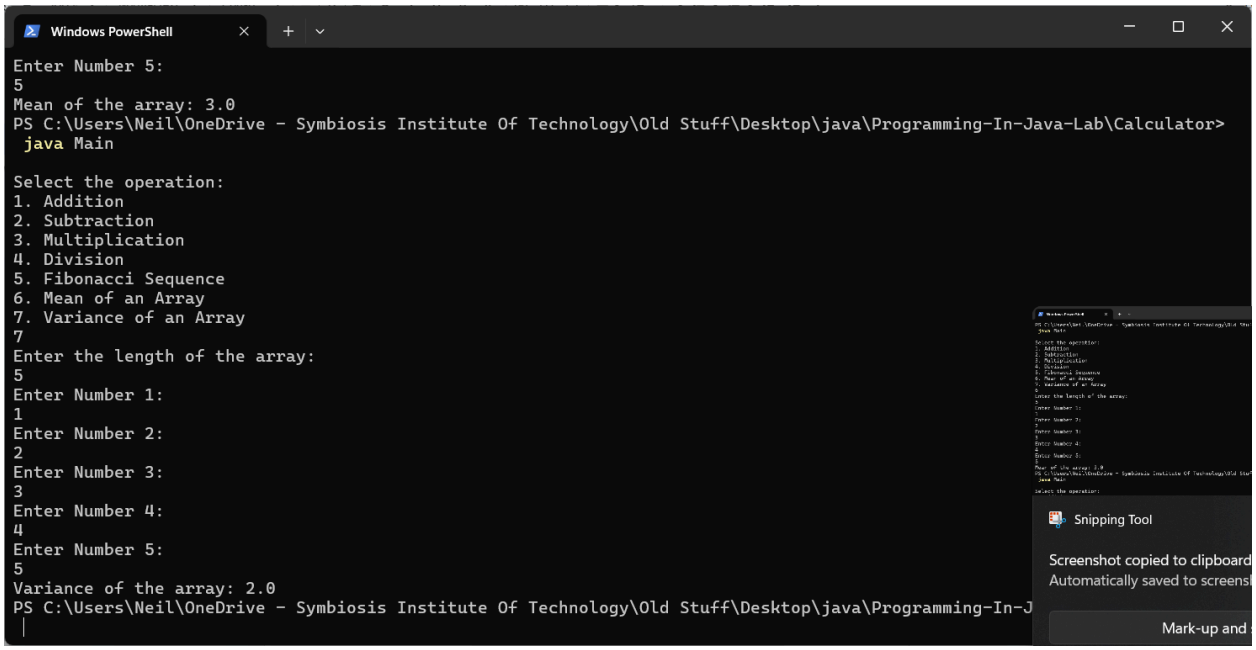

Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator> javac .\Main.java
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator> java Main
Select the operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Fibonacci Sequence
6. Mean of an Array
7. Variance of an Array
1
Enter 1st Number:
56
Enter 2nd Number:
89
Result of addition: 145
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator> java Main
Select the operation:
1. Addition
2. Subtraction


Windows PowerShell
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator> java Main
Select the operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Fibonacci Sequence
6. Mean of an Array
7. Variance of an Array
2
Enter 1st Number:
89
Enter 2nd Number:
36
Result of subtraction: 53
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator> java Main
Select the operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Fibonacci Sequence
6. Mean of an Array
7. Variance of an Array
3
Enter 1st Number:


Windows PowerShell
7. Variance of an Array
3
Enter 1st Number:
8
Enter 2nd Number:
9
Result of multiplication: 72
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator>
java Main
Select the operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Fibonacci Sequence
6. Mean of an Array
7. Variance of an Array
4
Enter 1st Number:
4
Enter 2nd Number:
4
Result of division: 1.0
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator>
java Main
Select the operation:
1. Addition
2. Subtraction


Windows PowerShell
2. Subtraction
3. Multiplication
4. Division
5. Fibonacci Sequence
6. Mean of an Array
7. Variance of an Array
4
Enter 1st Number:
4
Enter 2nd Number:
4
Result of division: 1.0
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator>
java Main
Select the operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Fibonacci Sequence
6. Mean of an Array
7. Variance of an Array
5
Enter the number of Fibonacci terms you want:
11
Fibonacci Sequence:
0 1 1 2 3 5 8 13 21 34 55
PS C:\Users\Neil\OneDrive - Symbiosis Institute Of Technology\Old Stuff\Desktop\java\Programming-In-Java-Lab\Calculator>
java Main





5. Calculator Repository

https://github.com/Neil-Cardoz/Programming-In-Java-Lab/tree/main/Calculator