Java Assignment 1

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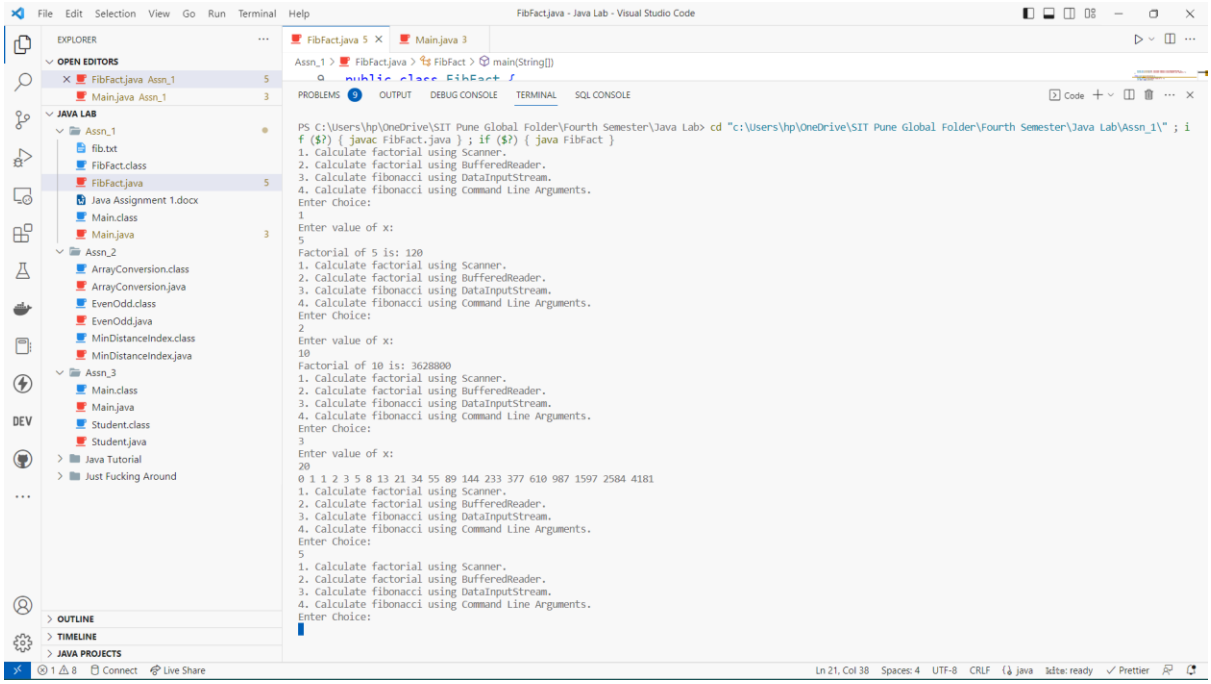
Fibonacci and Factorial

```
import java.util.Scanner;
import java.io.InputStreamReader;
import java.io.BufferedReader;
import java.io.DataInputStream;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.IOException;

public class FibFact {
    public static void main(String args[]) throws
IOException {
        Scanner input = new Scanner(System.in);
        int choice;
        while (true) {
            printMenu();
            System.out.println("Enter Choice: ");
            choice = input.nextInt();
            if (choice == 1) {
                factorialScanner();
            } else if (choice == 2) {
                factorialBufferedReader();
            } else if (choice == 3) {
                fibonacciDataInputStream();
            } else if (choice == 4) {
                nFibonacci(Integer.parseInt(args[0]));
            }
        }
    }

    static void printMenu() {
        System.out.println("1. Calculate factorial using
Scanner.");
```

```
        System.out.println("2. Calculate factorial using
BufferedReader.");
        System.out.println("3. Calculate fibonacci using
DataInputStream.");
        System.out.println("4. Calculate fibonacci using
Command Line Arguments.");
    }

    static void factorialScanner() {
        Scanner input = new Scanner(System.in);
        System.out.println("Enter value of x: ");
        int num = input.nextInt();
        int fact = 1;
        for (int i = 1; i <= num; i++) {
            fact *= i;
        }
        System.out.println("Factorial of " + num + " is: " +
fact);
    }

    static void factorialBufferedReader() throws IOException
{
        int num = 0;
        System.out.println("Enter value of x: ");
        BufferedReader reader = new BufferedReader(new
InputStreamReader(System.in));
        try {
            num = Integer.parseInt(reader.readLine());
        } catch (IOException e) {
            e.printStackTrace();
        }
        int fact = 1;
        for (int i = 1; i <= num; i++) {
            fact *= i;
        }
        System.out.println("Factorial of " + num + " is: " +
fact);
    }
```

```
    static void fibonacciDataInputStream() throws
IOException {
            int num = 0;
            System.out.println("Enter value of x: ");
            BufferedReader reader = new BufferedReader(new
InputStreamReader(System.in));
            num = Integer.parseInt(reader.readLine());
            int a = 0, b = 1, c;
            System.out.print(a + " " + b);
            for(int i = 2; i < num; i++) {
                c=a + b;
                System.out.print(" " + c);
                a = b;
                b = c;
            }
            System.out.print("\n");
    }

    static void nFibonacci(int n) {
        int a = 0, b = 1, c;
        System.out.print(a + " " + b);
        for(int i = 2; i < n; i++) {
            c=a + b;
            System.out.print(" " + c);
            a = b;
            b = c;
        }
        System.out.print("\n");
    }
}
```



Calculator

```java
import java.util.Scanner;

class Calculator {
    private double memory;

    public Calculator() {
        memory = 0.0;
    }

    public double add(double a, double b) {
        memory = a + b;
        return memory;
    }

    public double sub(double a, double b) {
        memory = a - b;
        return memory;
    }

    public double mul(double a, double b) {
        memory = a * b;
```

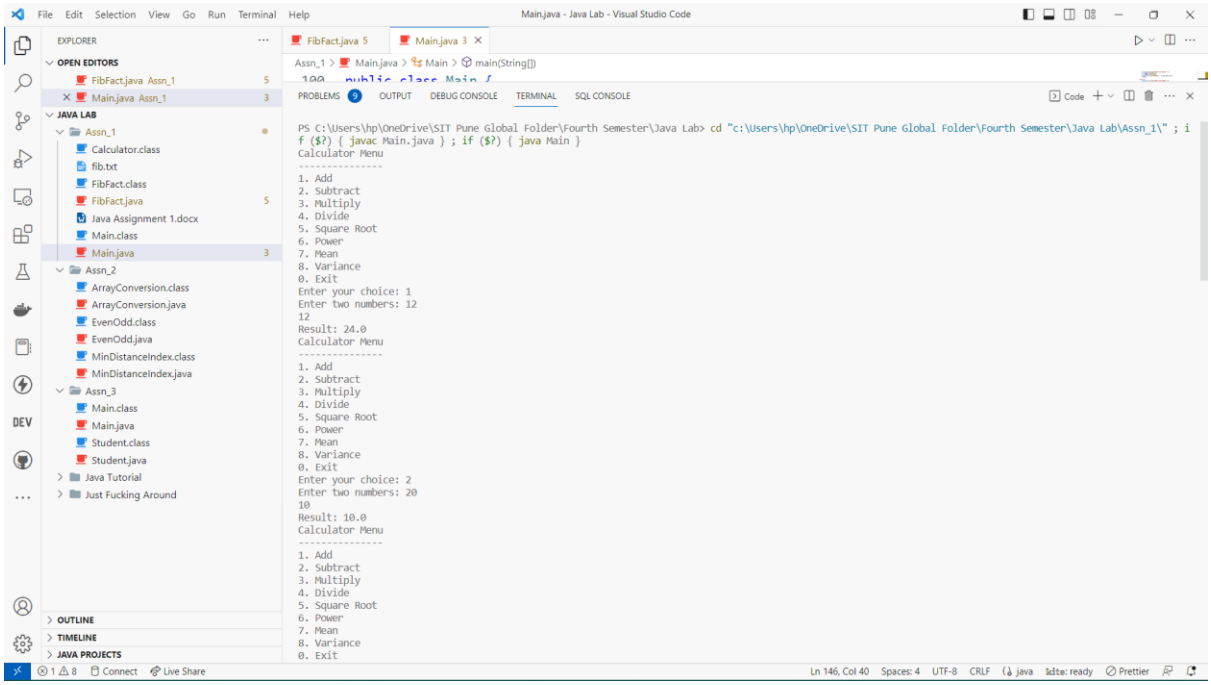
```
        return memory;
    }

    public double div(double a, double b) {
        if (b == 0) {
            System.out.println("Error: division by zero");
            return Double.NaN;
        } else {
            memory = a / b;
            return memory;
        }
    }

    public double sqrt(double a) {
        if (a < 0) {
            System.out.println("Error: square root of
negative number");
            return Double.NaN;
        } else {
            memory = Math.sqrt(a);
            return memory;
        }
    }

    public double power(double a, double b) {
        memory = Math.pow(a, b);
        return memory;
    }

    public double mean() {
        Scanner input = new Scanner(System.in);
        double sum = 0.0;
        int count = 0;
        double num;

        System.out.print("Enter a number or 'end' to stop:
");
        while (input.hasNextDouble()) {
```

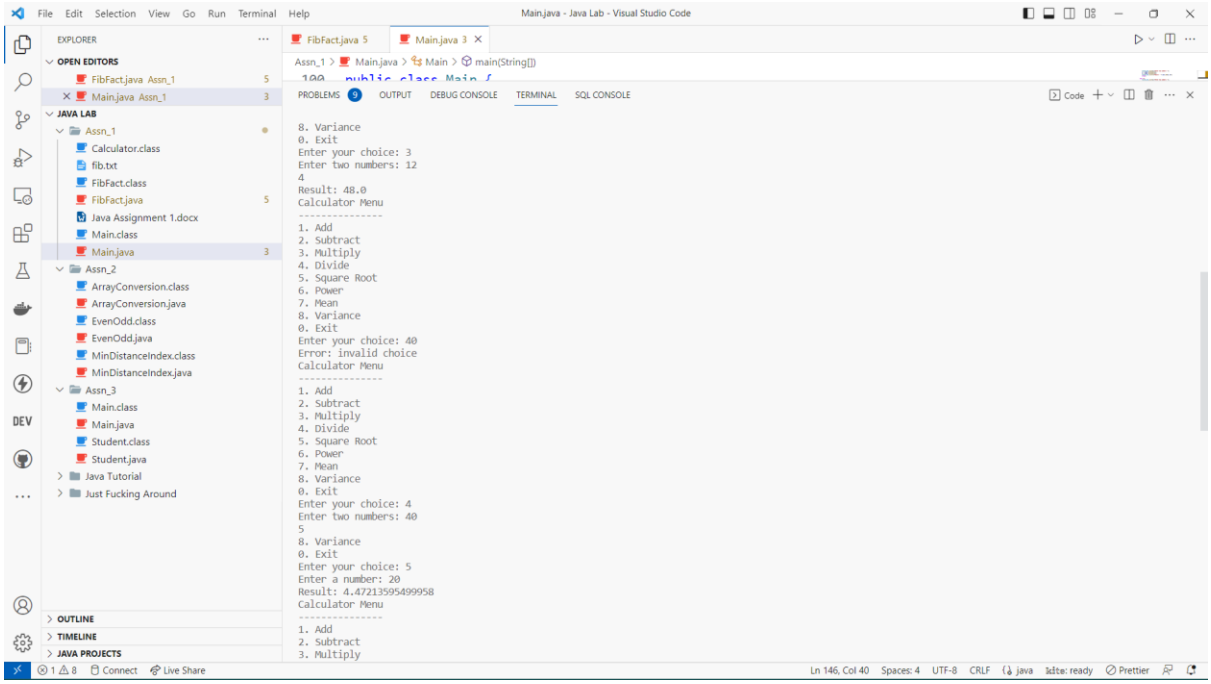
```
            num = input.nextDouble();
            sum += num;
            count++;
            System.out.print("Enter a number or 'end' to
stop: ");
        }

        if (count == 0) {
            System.out.println("Error: no numbers entered");
            return Double.NaN;
        } else {
            memory = sum / count;
            return memory;
        }
    }

    public double variance() {
        Scanner input = new Scanner(System.in);
        double sum = 0.0;
        double squareSum = 0.0;
        int count = 0;
        double num;

        System.out.print("Enter a number or 'end' to stop:
");
        while (input.hasNextDouble()) {
            num = input.nextDouble();
            sum += num;
            squareSum += num * num;
            count++;
            System.out.print("Enter a number or 'end' to
stop: ");
        }

        if (count == 0) {
            System.out.println("Error: no numbers entered");
            return Double.NaN;
        } else {
```

```
            double mean = sum / count;
            memory = squareSum / count - mean * mean;
            return memory;
        }
    }
}

public class Main {
    public static void main(String[] args) {
        Calculator calc = new Calculator();
        Scanner input = new Scanner(System.in);
        String choice;
        double a, b;

        do {
            System.out.println("Calculator Menu");
            System.out.println("---------------");
            System.out.println("1. Add");
            System.out.println("2. Subtract");
            System.out.println("3. Multiply");
            System.out.println("4. Divide");
            System.out.println("5. Square Root");
            System.out.println("6. Power");
            System.out.println("7. Mean");
            System.out.println("8. Variance");
            System.out.println("0. Exit");
            System.out.print("Enter your choice: ");
            choice = input.next();

            switch (choice) {
                case "1":
                System.out.print("Enter two numbers: ");
                a = input.nextDouble();
                b = input.nextDouble();
                System.out.println("Result: " + calc.add(a,
b));
                break;
```

```
            case "2":
                System.out.print("Enter two numbers: ");
                a = input.nextDouble();
                b = input.nextDouble();
                System.out.println("Result: " + calc.sub(a,
b));
                break;

            case "3":
                System.out.print("Enter two numbers: ");
                a = input.nextDouble();
                b = input.nextDouble();
                System.out.println("Result: " + calc.mul(a,
b));
                break;

            case "4":
                System.out.print("Enter two numbers: ");
                a = input.nextDouble();
                b = input.nextDouble();
                System.out.println("Result: " + calc.div(a,
b));
                break;

            case "5":
                System.out.print("Enter a number: ");
                a = input.nextDouble();
                System.out.println("Result: " +
calc.sqrt(a));
                break;

            case "6":
                System.out.print("Enter two numbers: ");
                a = input.nextDouble();
                b = input.nextDouble();
                System.out.println("Result: " +
calc.power(a, b));
                break;
```

```
            case "7":
                System.out.println("Result: " +
calc.mean());
                break;

            case "8":
                System.out.println("Result: " +
calc.variance());
                break;

            case "0":
                System.out.println("Program Terminating!");
                break;

            default:
                System.out.println("Error: invalid choice");
                break;
            }
        } while (!choice.equals("0"));
    }
}
```




File Edit Selection View Go Run Terminal Help
Main.java - Java Lab - Visual Studio Code
EXPLORER
OPEN EDITORS
FibFact.java Assn_1 5
Main.java Assn_1 3
JAVA LAB
Assn_1
Calculator.class
fib.txt
FibFact.class
FibFact.java 5
Java Assignment 1.docx
Main.class
Main.java 3
Assn_2
ArrayConversion.class
ArrayConversion.java
EvenOdd.class
EvenOdd.java
MinDistanceIndex.class
MinDistanceIndex.java
Assn_3
Main.class
Main.java
Student.class
Student.java
Java Tutorial
Just Fucking Around
OUTLINE
TIMELINE
JAVA PROJECTS
FibFact.java 5
Main.java 3
Assn_1 > Main.java > Main > main(String[])
PROBLEMS 9 OUTPUT DEBUG CONSOLE TERMINAL SQL CONSOLE
8. Variance
0. Exit
Enter your choice: 3
Enter two numbers: 12
4
Result: 48.0
Calculator Menu
1. Add
2. Subtract
3. Multiply
4. Divide
5. Square Root
6. Power
7. Mean
8. Variance
0. Exit
Enter your choice: 40
Error: invalid choice
Calculator Menu
1. Add
2. Subtract
3. Multiply
4. Divide
5. Square Root
6. Power
7. Mean
8. Variance
0. Exit
Enter your choice: 4
Enter two numbers: 40
5
8. Variance
0. Exit
Enter your choice: 5
Enter a number: 20
Result: 4.47213595499958
Calculator Menu
1. Add
2. Subtract
3. Multiply
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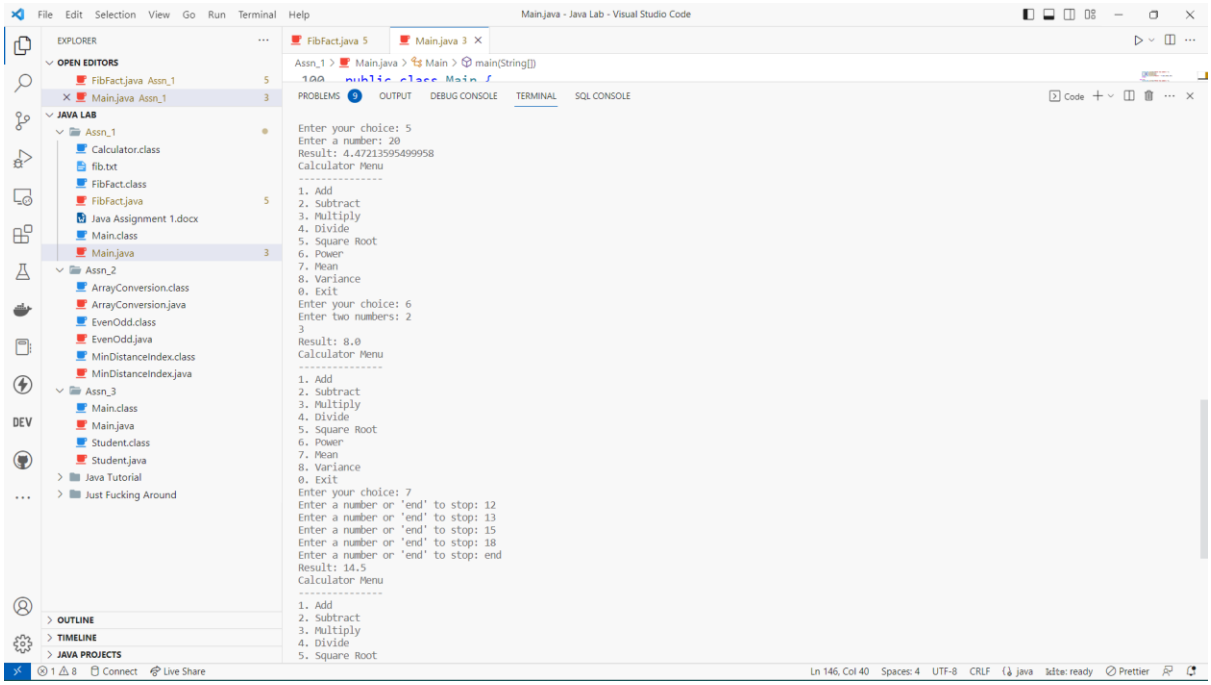
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Assn_3
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Java Tutorial
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JAVA PROJECTS
FibFact.java 5
Main.java 3
Assn_1 > Main.java > Main > main(String[])
PROBLEMS 9 OUTPUT DEBUG CONSOLE TERMINAL SQL CONSOLE
Enter your choice: 5
Enter a number: 20
Result: 4.47213595499958
Calculator Menu
1. Add
2. Subtract
3. Multiply
4. Divide
5. Square Root
6. Power
7. Mean
8. Variance
0. Exit
Enter your choice: 6
Enter two numbers: 2
3
Result: 8.0
Calculator Menu
1. Add
2. Subtract
3. Multiply
4. Divide
5. Square Root
6. Power
7. Mean
8. Variance
0. Exit
Enter your choice: 7
Enter a number or 'end' to stop: 12
Enter a number or 'end' to stop: 13
Enter a number or 'end' to stop: 15
Enter a number or 'end' to stop: 18
Enter a number or 'end' to stop: end
Result: 14.5
Calculator Menu
1. Add
2. Subtract
3. Multiply
4. Divide
5. Square Root
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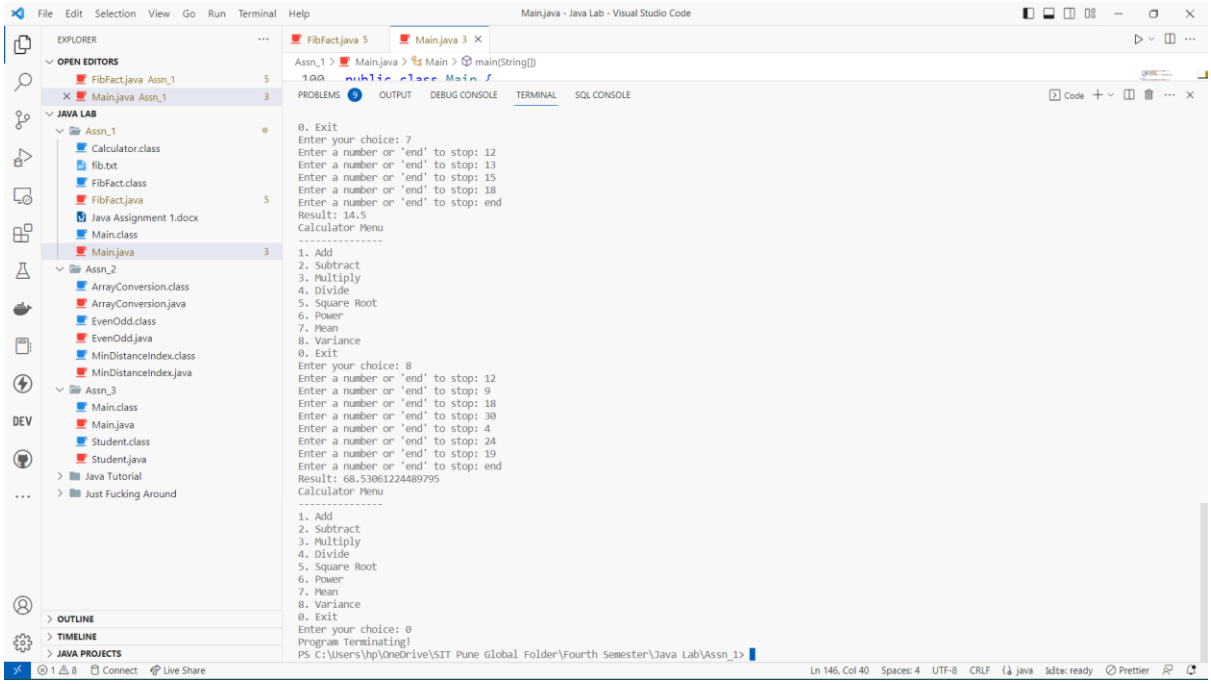

Github: https://github.com/om-varshney/Java-Lab/tree/main/Assn_1