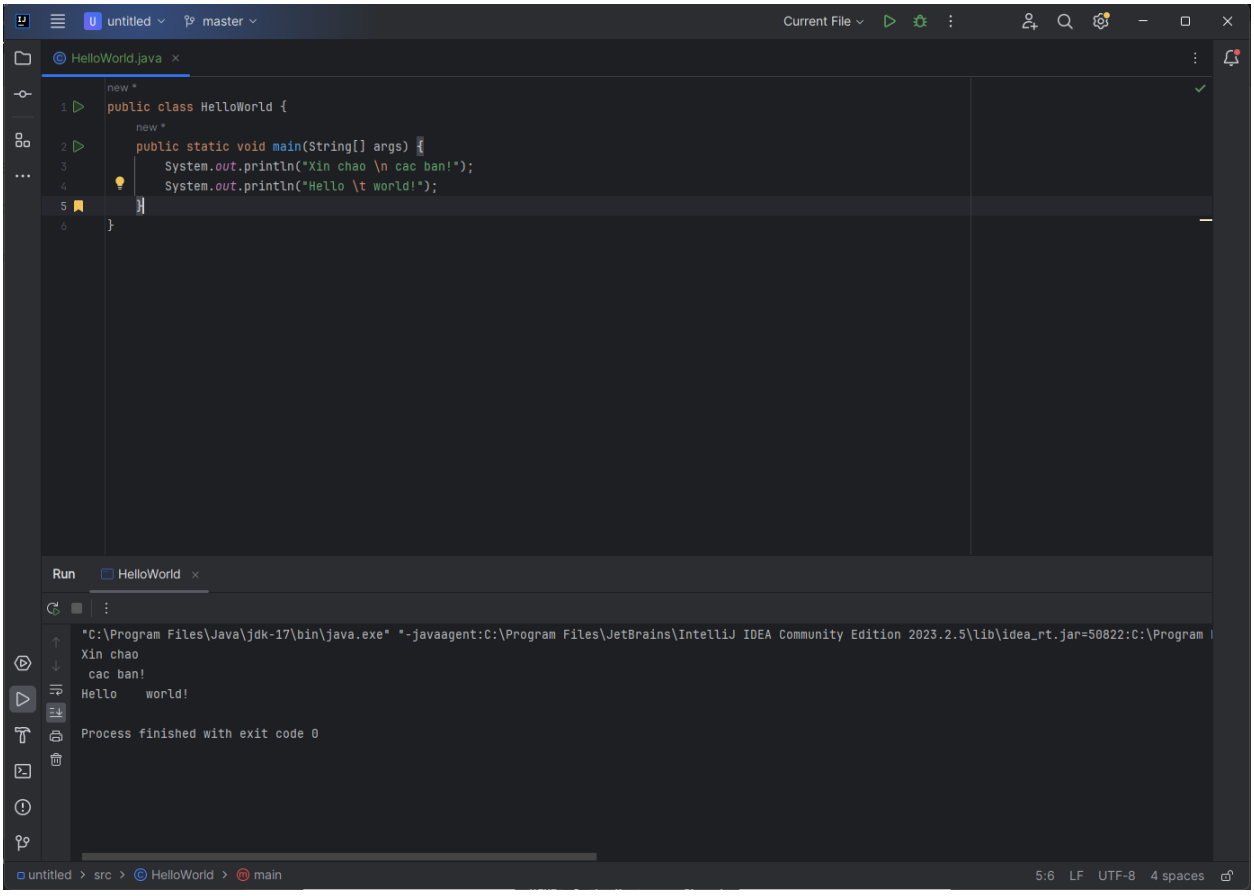
BÁO CÁO THỰC HÀNH LAB 1- LAB 1 REPORT
LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG - Object oriented programming

The Very First Java Programs

2.2.1 Write, compile the first Java application:

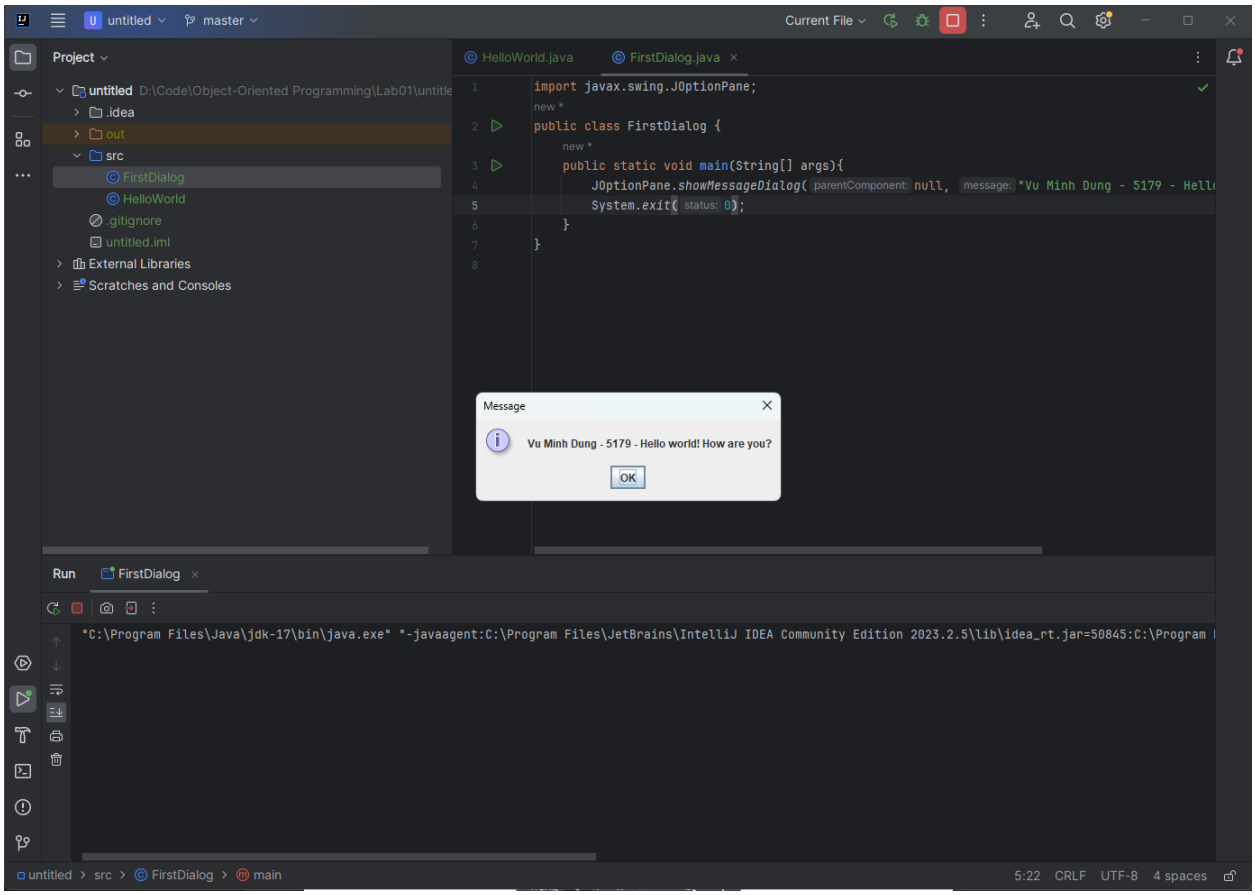
```java
//Example 1: HelloWorld.java
//Text-printing program
public class HelloWorld {

   public static void main(String args[]){
        System.out.println("Xin chao \n cac ban!");
        System.out.println("Hello \t world!");

   } // end of method main
}
```

Result-Kết quả



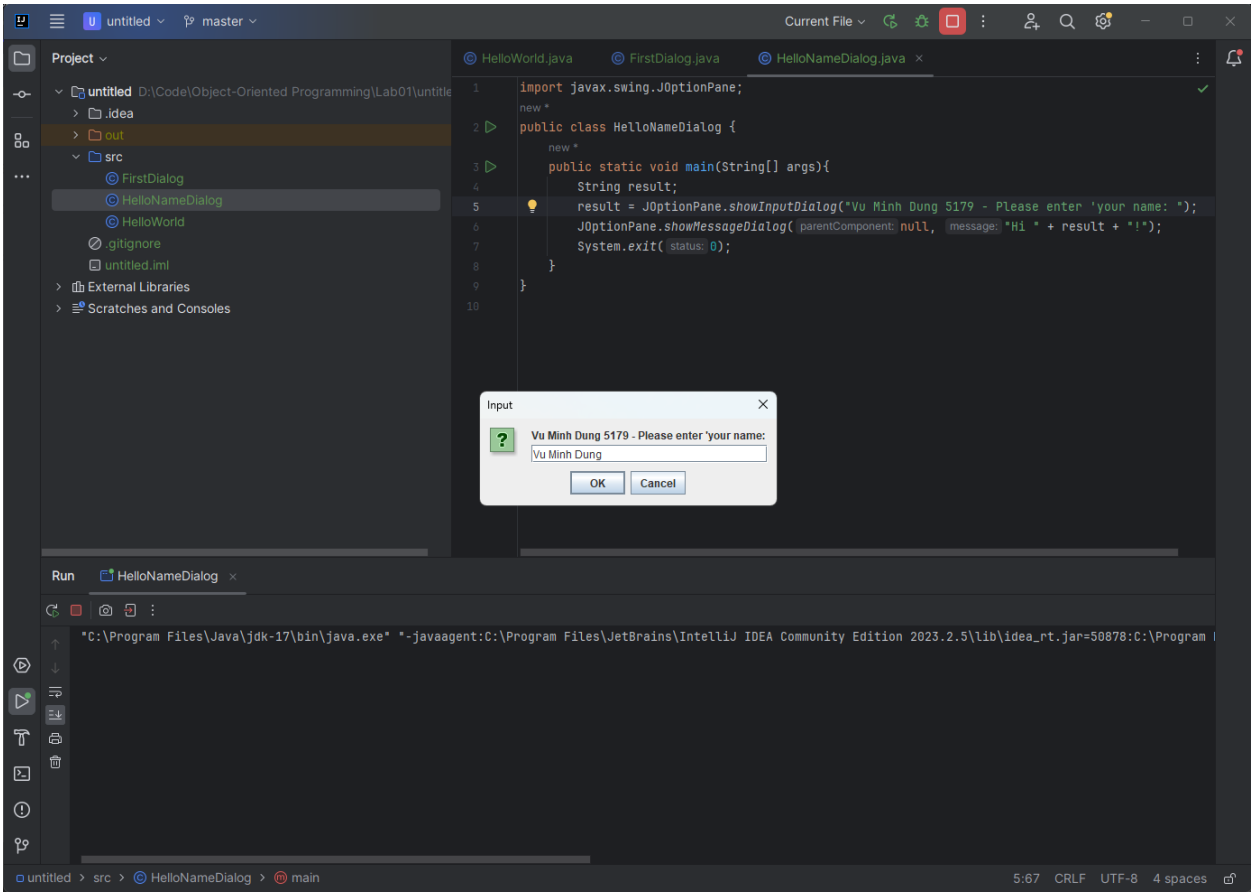
2.2.2 Write, compile the first dialog Java program

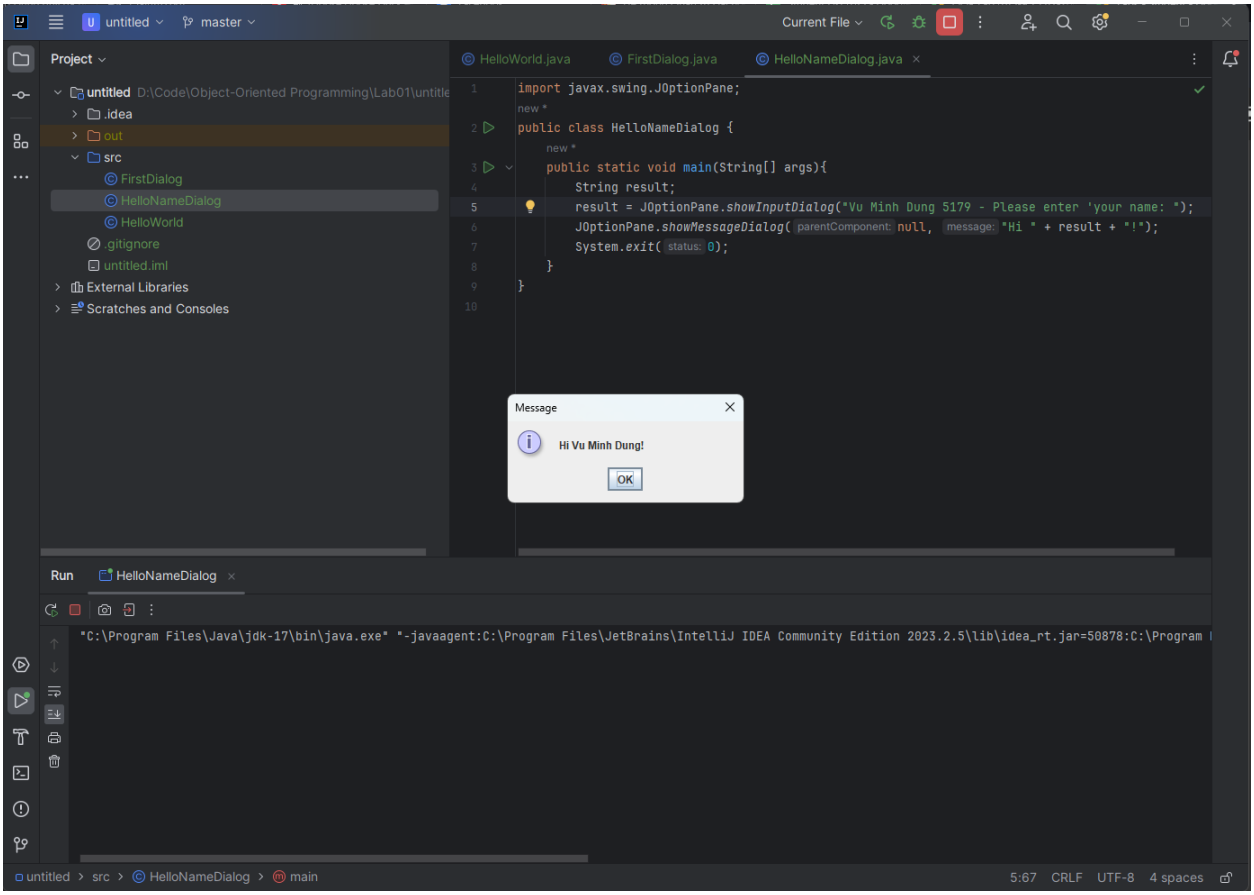
```java
// Example 2: FirstDialog.java
import javax.swing.JOptionPane;
public class FirstDialog{
    public static void main(String[] args){
        JOptionPane.showMessageDialog(null,"Hello world! How are you?");
        System.exit(0);
    }
}
```



2.2.3 Write, compile the first input dialog Java application

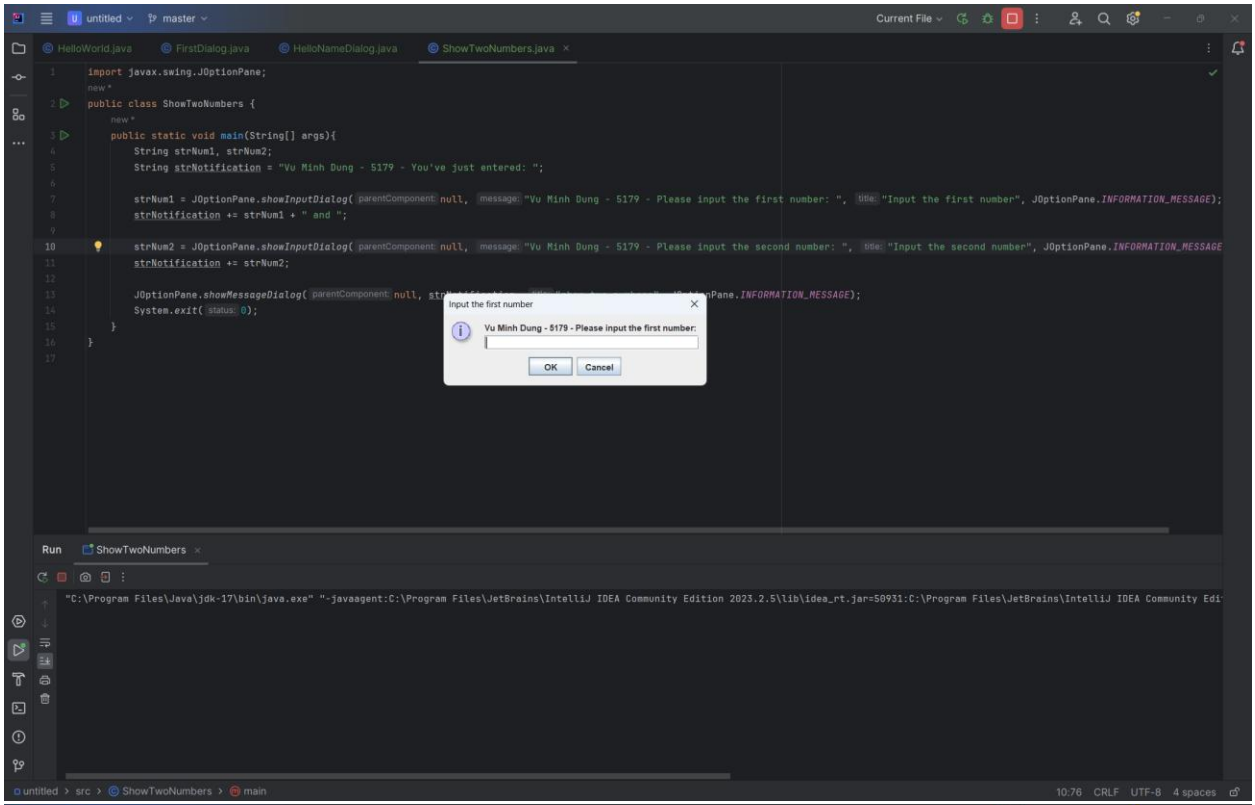
```java
// Example 3: HelloNameDialog.java
import javax.swing.JOptionPane;
public class HelloNameDialog{
  public static void main(String[] args){
    String result;
    result = JOptionPane.showInputDialog("Please enter your name:");
    JOptionPane.showMessageDialog(null, "Hi "+ result + "!");
    System.exit(0);
  }
}
```


untitled
master
Current File
Project
HelloWorld.java
FirstDialog.java
HelloNameDialog.java
import javax.swing.JOptionPane;
public class HelloNameDialog {
public static void main(String[] args){
String result;
result = JOptionPane.showInputDialog("Vu Minh Dung 5179 - Please enter 'your name: ");
JOptionPane.showMessageDialog(parentComponent: null, message: "Hi " + result + "!");
System.exit(status: 0);
}
}
Input
Vu Minh Dung 5179 - Please enter 'your name:
Vu Minh Dung
OK
Cancel
Run
HelloNameDialog
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.5\lib\idea_rt.jar=50878:C:\Program
untitled > src > HelloNameDialog > main
5:67 CRLF UTF-8 4 spaces



2.2.4 Write, compile, and run the following example:

```java
// Example 5: ShowTwoNumbers.java
import javax.swing.JOptionPane;
public class ShowTwoNumbers {
  public static void main(String[] args){
    String strNum1, strNum2;
    String strNotification = "You've just entered: ";

    strNum1 = JOptionPane.showInputDialog(null,
                "Please input the first number: ","Input the first number",
                JOptionPane.INFORMATION_MESSAGE);
    strNotification += strNum1 + " and ";

    strNum2 = JOptionPane.showInputDialog(null,
                "Please input the second number: ","Input the second number",
                JOptionPane.INFORMATION_MESSAGE);
    strNotification += strNum2;

    JOptionPane.showMessageDialog(null,strNotification,
                "Show two numbers", JOptionPane.INFORMATION_MESSAGE);
    System.exit(0);
  }
}
```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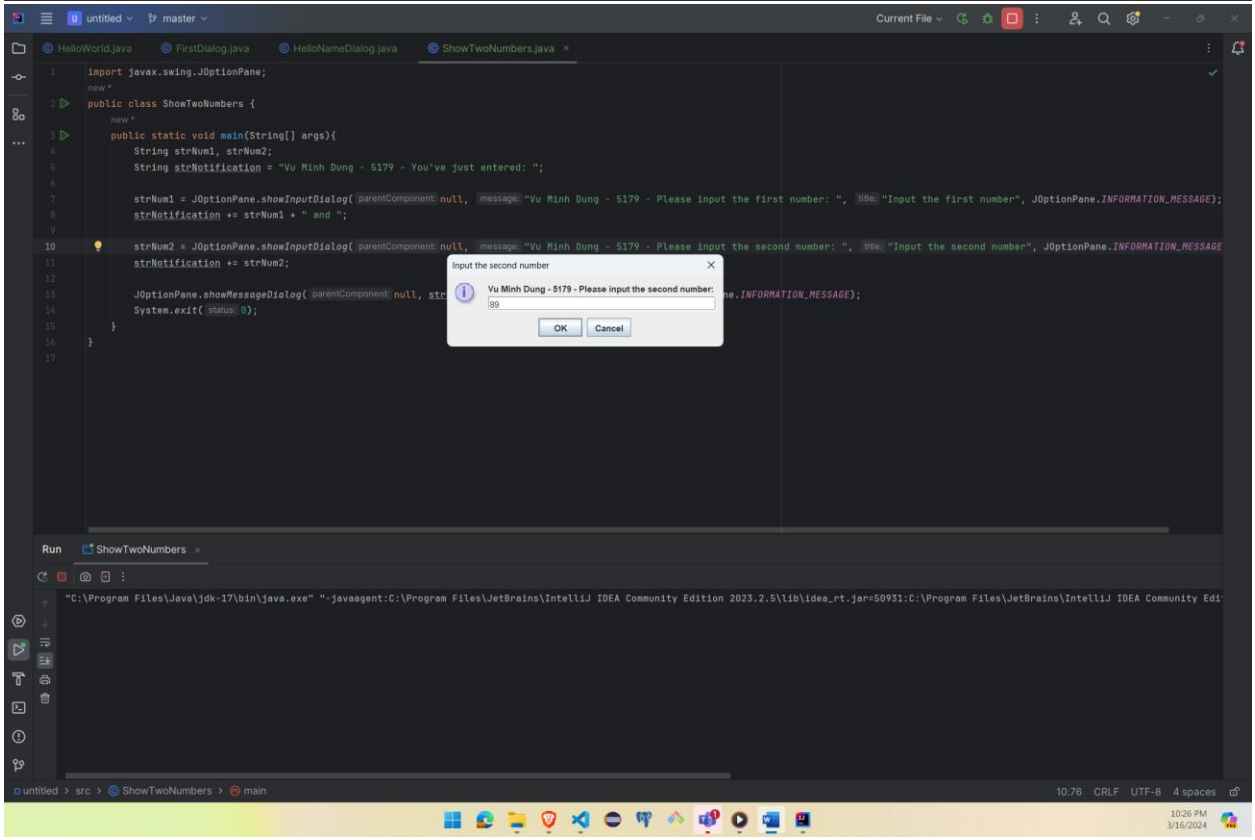
Current File
HelloWorld.java
FirstDialog.java
HelloNameDialog.java
ShowTwoNumbers.java
import javax.swing.JOptionPane;
public class ShowTwoNumbers {
public static void main(String[] args){
String strNum1, strNum2;
String strNotification = "Vu Minh Dung - 5179 - You've just entered: ";
strNum1 = JOptionPane.showInputDialog(parentComponent: null, message: "Vu Minh Dung - 5179 - Please input the first number: ", title: "Input the first number", JOptionPane.INFORMATION_MESSAGE);
strNotification += strNum1 + " and ";
strNum2 = JOptionPane.showInputDialog(parentComponent: null, message: "Vu Minh Dung - 5179 - Please input the second number: ", title: "Input the second number", JOptionPane.INFORMATION_MESSAGE
strNotification += strNum2;
JOptionPane.showMessageDialog(parentComponent: null,
System.exit(status: 0);
Input the first number
Vu Minh Dung - 5179 - Please input the first number:
OK
Cancel
Run
ShowTwoNumbers
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.5\lib\idea_rt.jar=50931:C:\Program Files\JetBrains\IntelliJ IDEA Community Edi
10:76 CRLF UTF-8 4 spaces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master
Current File
HelloWorld.java
FirstDialog.java
HelloNameDialog.java
ShowTwoNumbers.java
import javax.swing.JOptionPane;
public class ShowTwoNumbers {
public static void main(String[] args){
String strNum1, strNum2;
String strNotification = "Vu Minh Dung - 5179 - You've just entered: ";
strNum1 = JOptionPane.showInputDialog(parentComponent: null, message: "Vu Minh Dung - 5179 - Please input the first number: ", title: "Input the first number", JOptionPane.INFORMATION_MESSAGE);
strNotification += strNum1 + " and ";
strNum2 = JOptionPane.showInputDialog(parentComponent: null, message: "Vu Minh Dung - 5179 - Please input the second number: ", title: "Input the second number", JOptionPane.INFORMATION_MESSAGE
strNotification += strNum2;
JOptionPane.showMessageDialog(parentComponent: null,
System.exit(status: 0);
Input the second number
Vu Minh Dung - 5179 - Please input the second number:
89
OK
Cancel
Run
ShowTwoNumbers
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.5\lib\idea_rt.jar=50931:C:\Program Files\JetBrains\IntelliJ IDEA Community Edi
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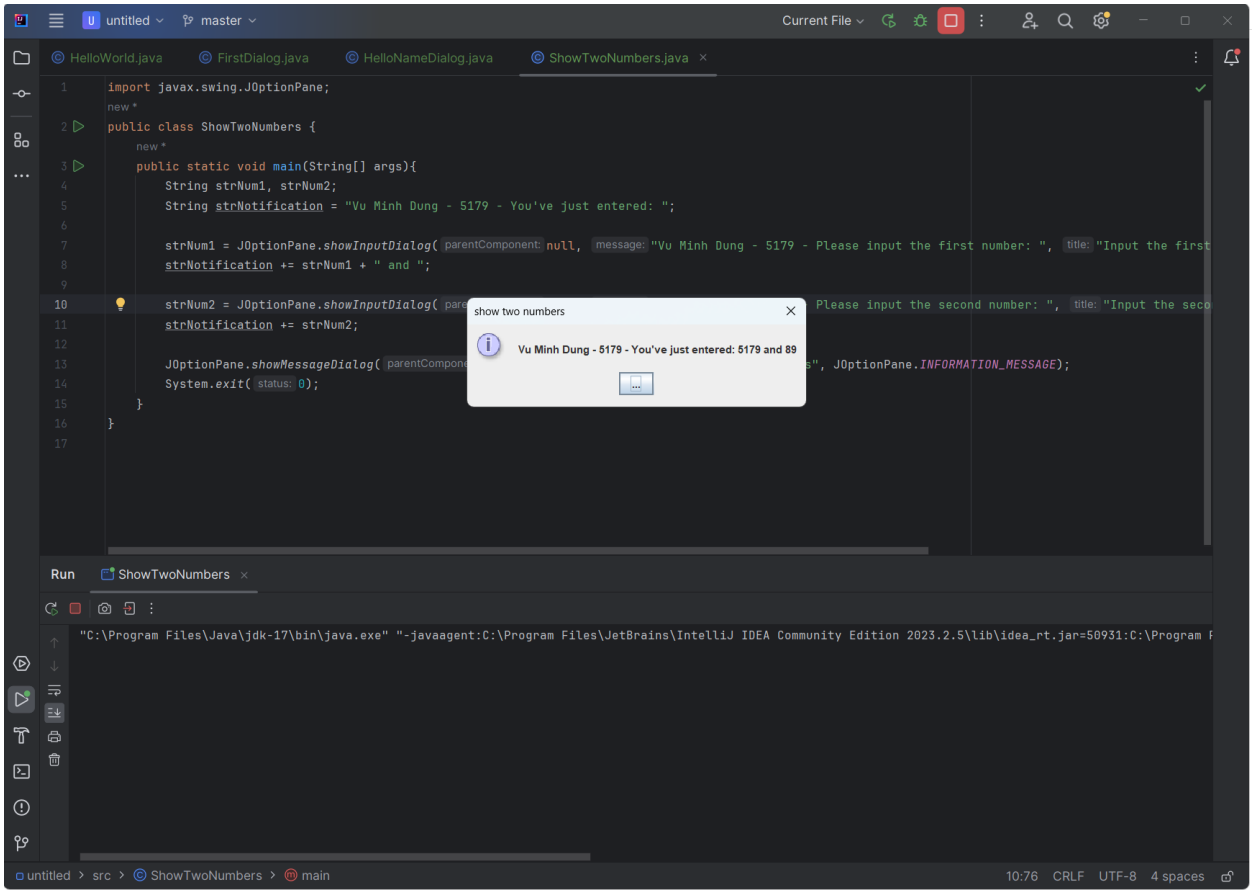


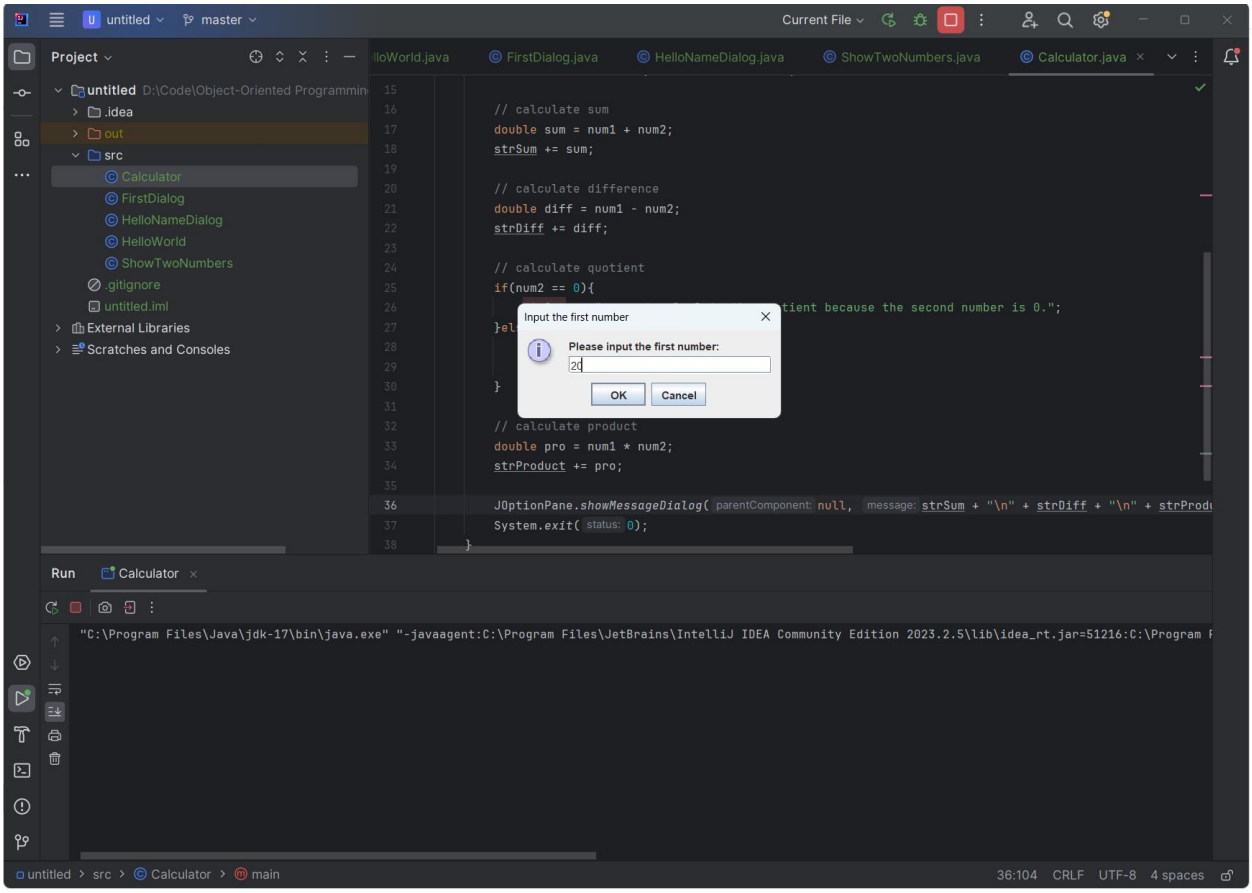
2.2.5 Write a program to calculate sum, difference, product, and quotient of 2 double numbers which are entered by users.

Notes

- To convert from String to double, you can use

```
double num1 = Double.parseDouble(strNum1)
```

- Check the divisor of the division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src
Calculator
FirstDialog
HelloNameDialog
HelloWorld
ShowTwoNumbers
.gitignore
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External Libraries
Scratches and Consoles
FirstDialog.java
HelloNameDialog.java
ShowTwoNumbers.java
Calculator.java
// calculate sum
double sum = num1 + num2;
strSum += sum;
// calculate difference
double diff = num1 - num2;
strDiff += diff;
// calculate quotient
if(num2 == 0){
}
// calculate product
double pro = num1 * num2;
strProduct += pro;
JOptionPane.showMessageDialog(parentComponent: null, message: strSum + "\n" + strDiff + "\n" + strProdu
System.exit(status: 0);
Input the first number
Please input the first number:
2d
OK
Cancel
Run
Calculator
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.5\lib\idea_rt.jar=51216:C:\Program
untitled > src > Calculator > main
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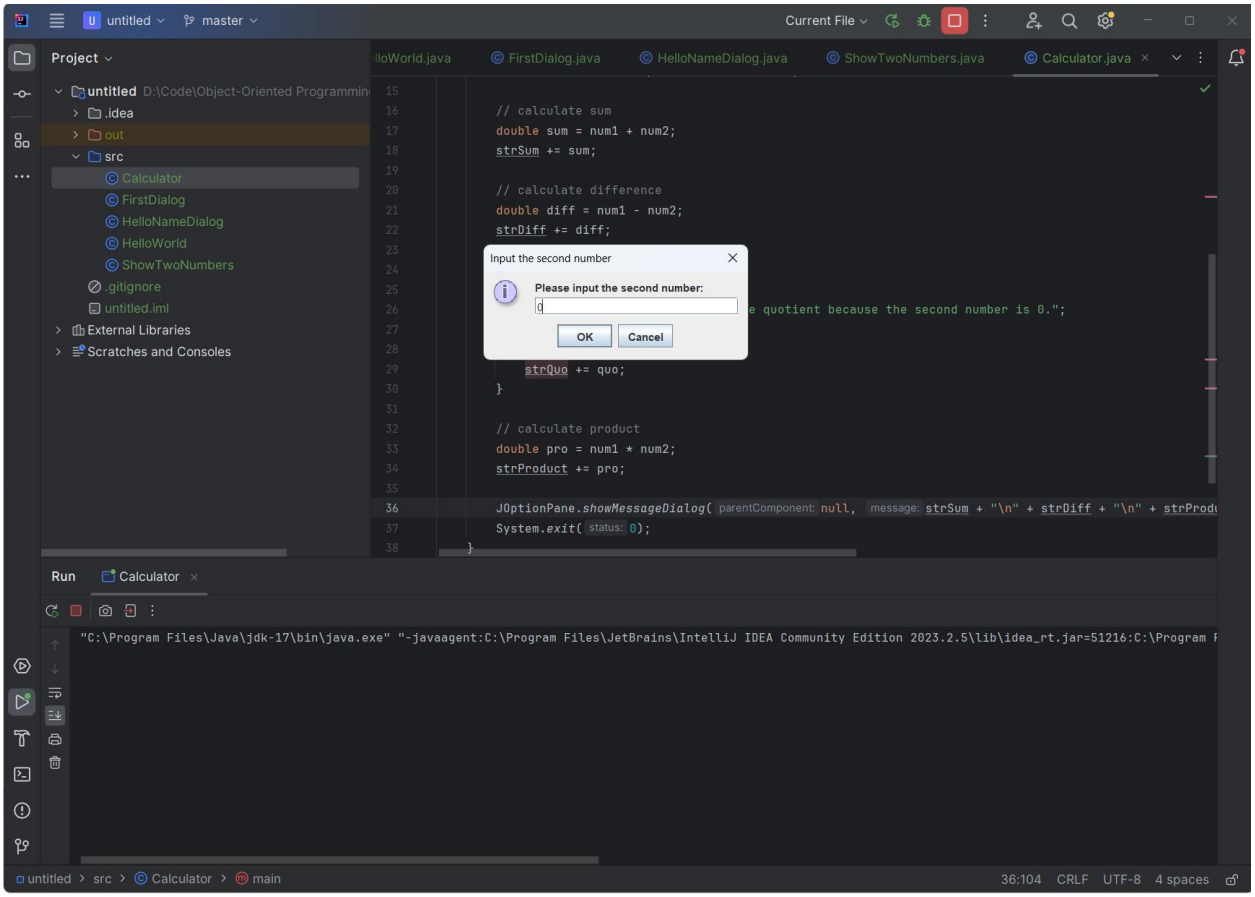
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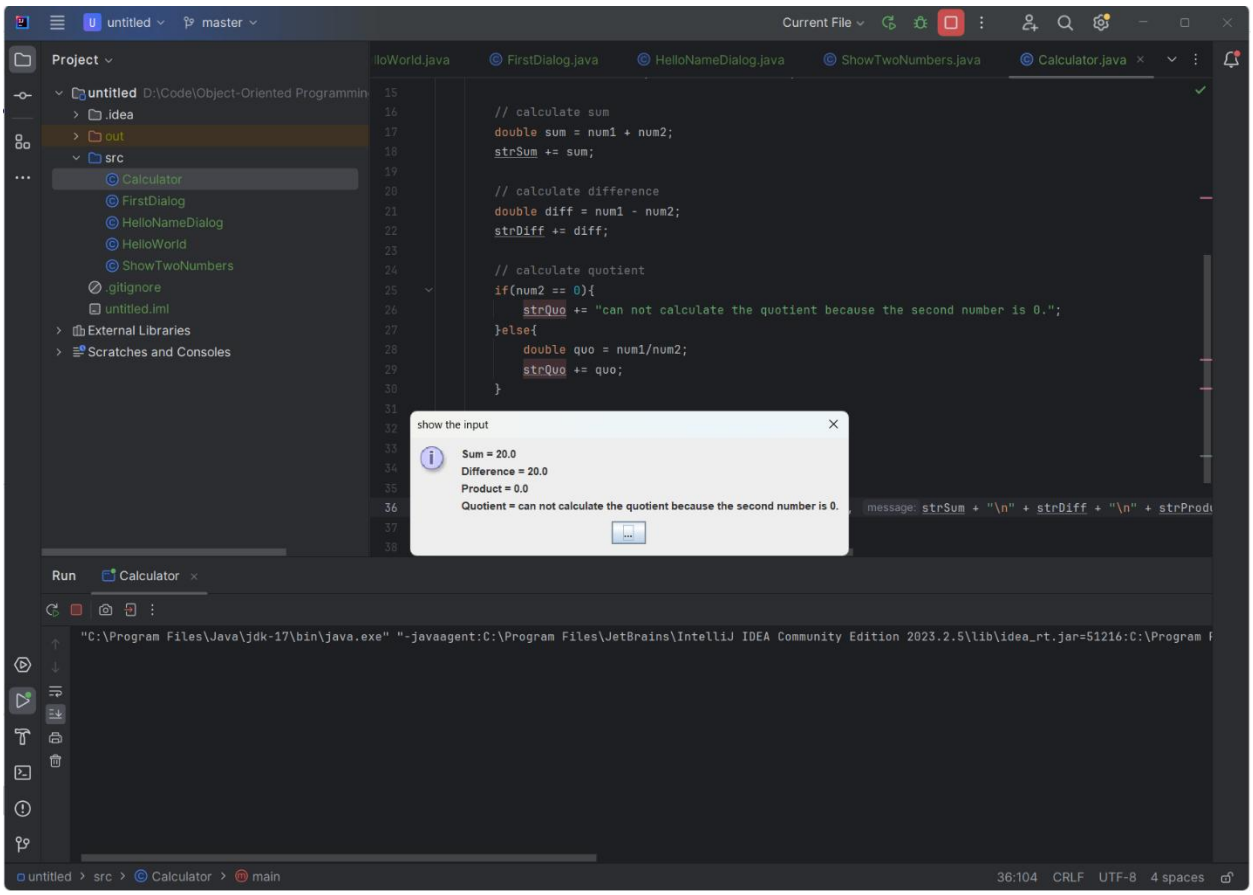
Calculator
FirstDialog
HelloNameDialog
HelloWorld
ShowTwoNumbers
.gitignore
untitled.iml
External Libraries
Scratches and Consoles
FirstDialog.java
HelloNameDialog.java
ShowTwoNumbers.java
Calculator.java
// calculate sum
double sum = num1 + num2;
strSum += sum;
// calculate difference
double diff = num1 - num2;
strDiff += diff;
Input the second number
Please input the second number:
0
OK
Cancel
e quotient because the second number is 0.";
strQuo += quo;
}
// calculate product
double pro = num1 * num2;
strProduct += pro;
JOptionPane.showMessageDialog(parentComponent: null, message: strSum + "\n" + strDiff + "\n" + strProd
System.exit(status: 0);
}
Run
Calculator
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.5\lib\idea_rt.jar=51216:C:\Program F
untitled > src > Calculator > main
36:104 CRLF UTF-8 4 spaces

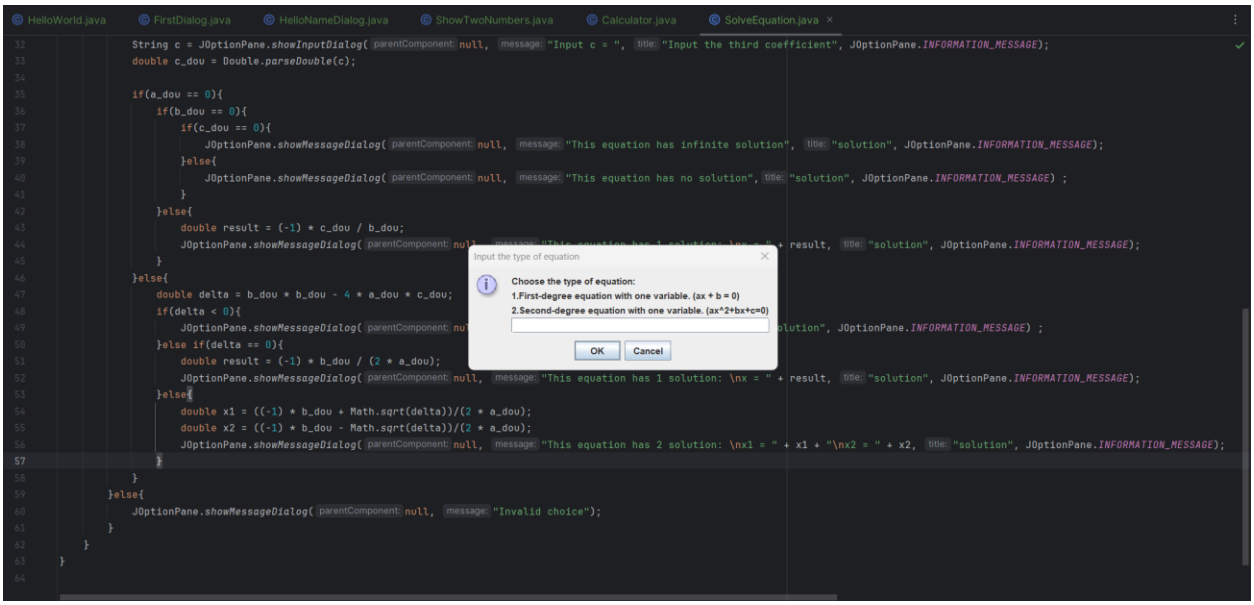


2.2.6 Write a program to solve:

- the first-degree equation (linear equation) with one variable
- the system of first-degree equations (linear system) with two variables
- the second-degree equation with one variable

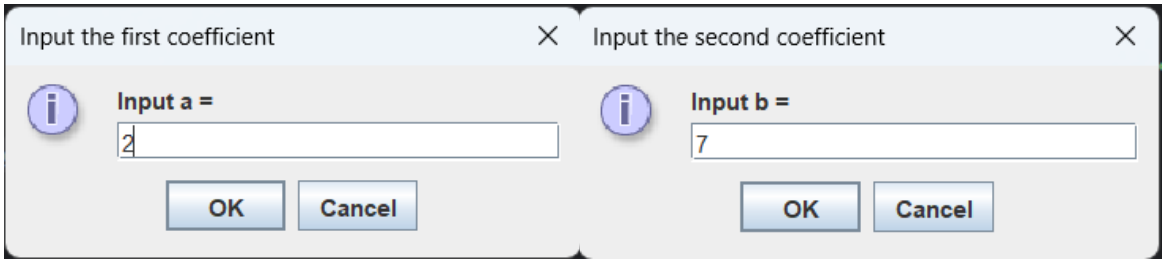
HelloWorld.java FirstDialog.java HelloNameDialog.java ShowTwoNumbers.java Calculator.java SolveEquation.java

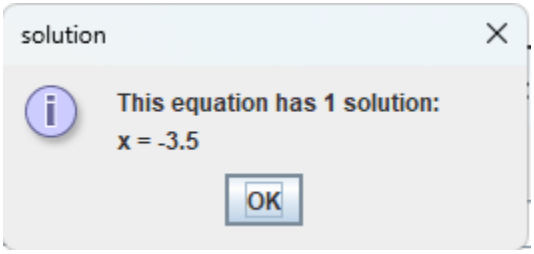
```java
import javax.swing.JOptionPane;
new *
public class SolveEquation {
    new *
    public static void main(String[] args){
        String choice;
        choice = JOptionPane.showInputDialog( parentComponent: null, message: "Choose the type of equation: \n1.First-degree equation with one variable. (ax + b = 0)\n2.Second-degree equation with one

        int choice_int = Integer.parseInt(choice);
        if(choice_int == 1){
            String a = JOptionPane.showInputDialog( parentComponent: null, message: "Input a = ", title: "Input the first coefficient", JOptionPane.INFORMATION_MESSAGE);
            double a_dou = Double.parseDouble(a);

            String b = JOptionPane.showInputDialog( parentComponent: null, message: "Input b = ", title: "Input the second coefficient", JOptionPane.INFORMATION_MESSAGE);
            double b_dou = Double.parseDouble(b);

            if(a_dou == 0){
                if(b_dou != 0){
                    JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has no solution", title: "solution", JOptionPane.INFORMATION_MESSAGE);
                }else{
                    JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has infinite solution", title: "solution", JOptionPane.INFORMATION_MESSAGE);
                }
            }else{
                double solution = (-1) * b_dou / a_dou;
                JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has 1 solution: \nx = " + solution, title: "solution", JOptionPane.INFORMATION_MESSAGE);
            }
        }else if(choice_int == 2){
            String a = JOptionPane.showInputDialog( parentComponent: null, message: "Input a = ", title: "Input the first coefficient", JOptionPane.INFORMATION_MESSAGE);
            double a_dou = Double.parseDouble(a);

            String b = JOptionPane.showInputDialog( parentComponent: null, message: "Input b = ", title: "Input the second coefficient", JOptionPane.INFORMATION_MESSAGE);
            double b_dou = Double.parseDouble(b);

            String c = JOptionPane.showInputDialog( parentComponent: null, message: "Input c = ", title: "Input the third coefficient", JOptionPane.INFORMATION_MESSAGE);
            double c_dou = Double.parseDouble(c);

            if(a_dou == 0){
                if(b_dou == 0){
                    if(c_dou == 0){
                        JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has infinite solution", title: "solution", JOptionPane.INFORMATION_MESSAGE);
                    }else{
                        JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has no solution", title: "solution", JOptionPane.INFORMATION_MESSAGE) ;
                    }
                }else{
                    double result = (-1) * c_dou / b_dou;
                    JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has 1 solution: \nx = " + result, title: "solution", JOptionPane.INFORMATION_MESSAGE);
                }
            }else{
                double delta = b_dou * b_dou - 4 * a_dou * c_dou;
                if(delta < 0){
                    JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has no solution", title: "solution", JOptionPane.INFORMATION_MESSAGE) ;
                }else if(delta == 0){
                    double result = (-1) * b_dou / (2 * a_dou);
                    JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has 1 solution: \nx = " + result, title: "solution", JOptionPane.INFORMATION_MESSAGE);
                }else{
                    double x1 = ((-1) * b_dou + Math.sqrt(delta))/(2 * a_dou);
                    double x2 = ((-1) * b_dou - Math.sqrt(delta))/(2 * a_dou);
                    JOptionPane.showMessageDialog( parentComponent: null, message: "This equation has 2 solution: \nx1 = " + x1 + "\nx2 = " + x2, title: "solution", JOptionPane.INFORMATION_MESSAGE);
                }
            }
        }else{
            JOptionPane.showMessageDialog( parentComponent: null, message: "Invalid choice");
        }
    }
}
```



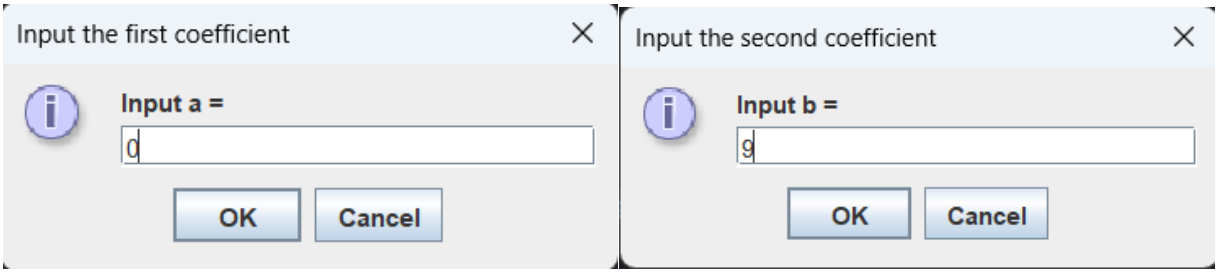
Result

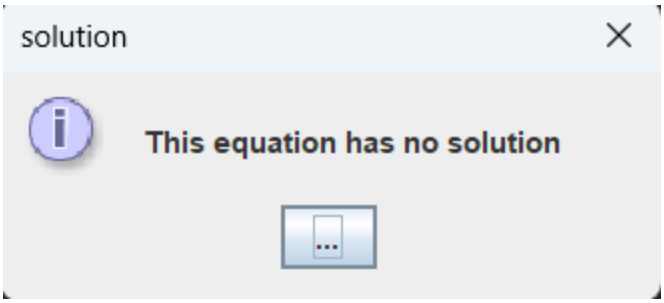
1. First equation:
    a. 1 solution



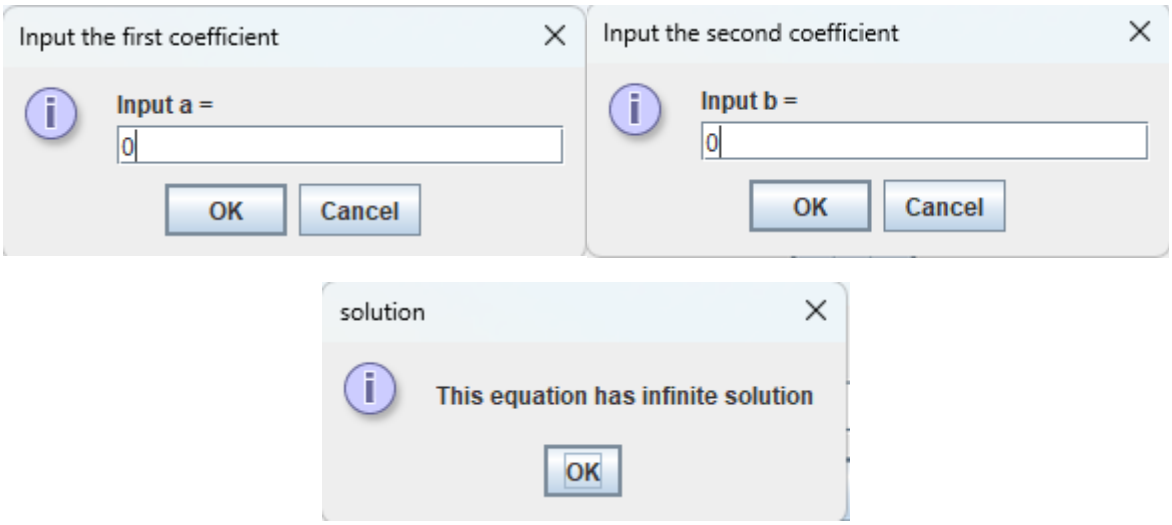


b. No solution

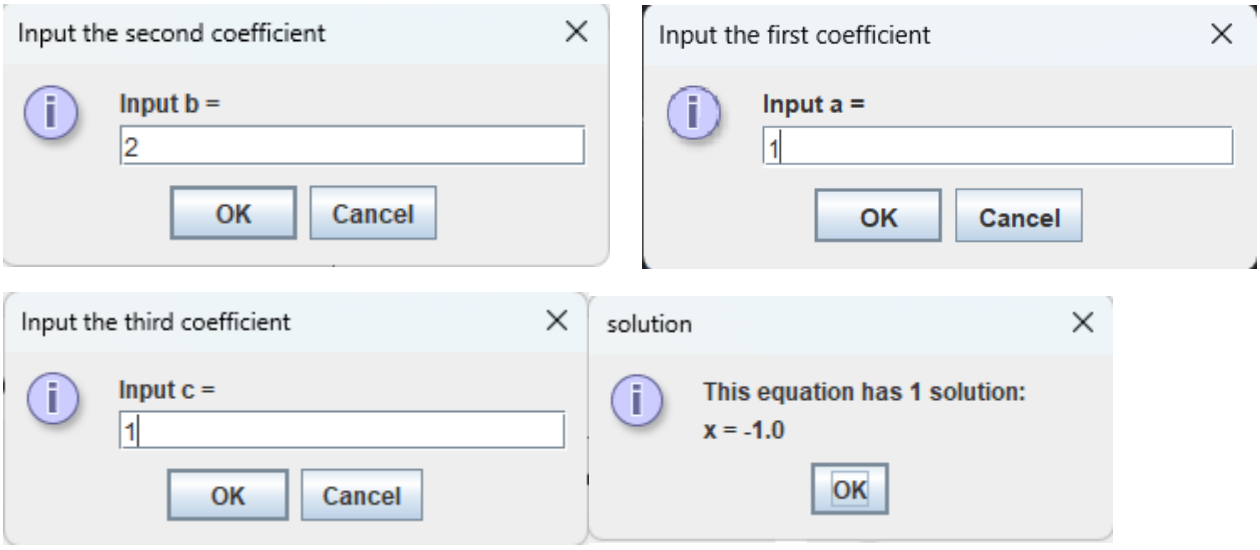




c. Infinite solution

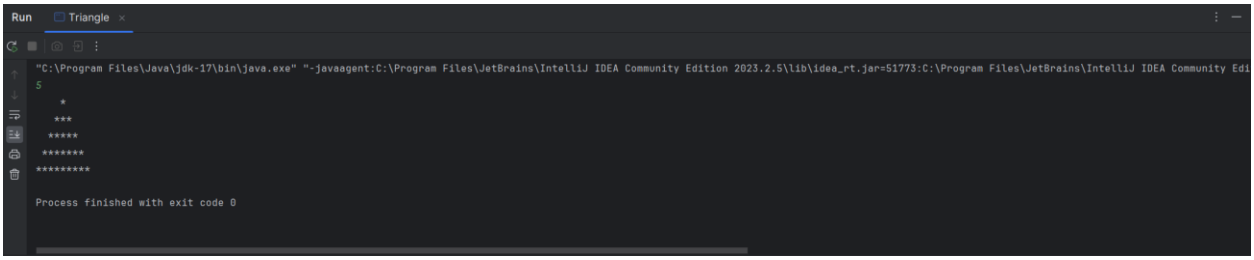


2. Second degree with one variable



6.3 Write a program to display a triangle with a height of n stars (*), n is entered by users:

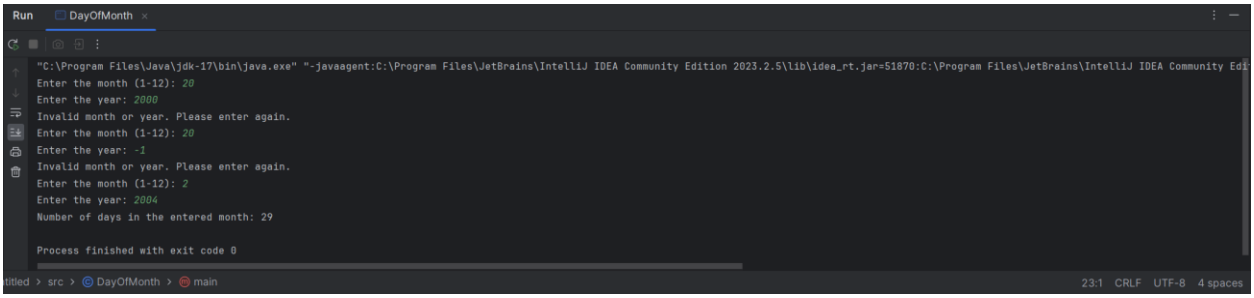
```java
import java.util.Scanner;
new *
public class Triangle {
    new *
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();

        for(int i = 1; i <= n; i++){
            for(int j = 1; j <= n - i; j++){
                System.out.print(" ");
            }
            for(int k = 1; k <= 2 * i - 1; k++){
                System.out.print("*");
            }
            System.out.println();
        }

        sc.close();
    }
}
```



6.4 Write a program to *display the number of days of a month, which is entered by users (both month and year). If it is an invalid month/year, ask the user to enter again.*

tDialog.java | HelloNameDialog.java | ShowTwoNumbers.java | Calculator.java | SolveEquation.java | Triangle.java | DayOfMonth.java

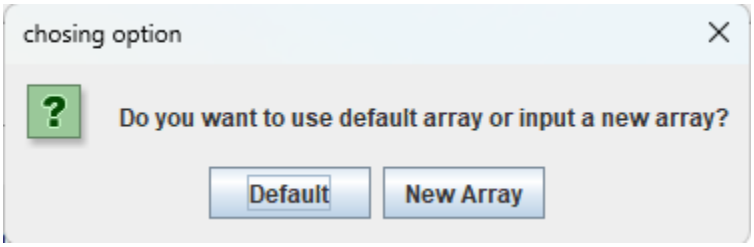
```java
import java.util.Scanner;
new *
public class DayOfMonth {
    new *
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        int month, year;
        boolean validInput = false;

        // Loop until valid input is provided
        do {
            System.out.print("Enter the month (1-12): ");
            month = scanner.nextInt();
            System.out.print("Enter the year: ");
            year = scanner.nextInt();

            // Check if the month and year are valid
            if (month < 1 || month > 12 || year < 1) {
                System.out.println("Invalid month or year. Please enter again.");
                continue;
            } else {
                validInput = true;
            }

//              System.out.print("Enter the year: ");
//              year = scanner.nextInt();
        } while (!validInput);

        // Determine the number of days in the entered month
        int daysInMonth;
        switch (month) {
            case 2: // February
                if (isLeapYear(year)) {
                    daysInMonth = 29;
                } else {
                    daysInMonth = 28;
                }
                break;
            case 4:
            case 6:
            case 9:
            case 11: // April, June, September, November
                daysInMonth = 30;
                break;
            default: // January, March, May, July, August, October, December
                daysInMonth = 31;
                break;
        }

        System.out.println("Number of days in the entered month: " + daysInMonth);

        scanner.close();
    }

    // Method to check if a year is a leap year
    1 usage  new *
    public static boolean isLeapYear(int year) {
        return (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);
    }
}
```



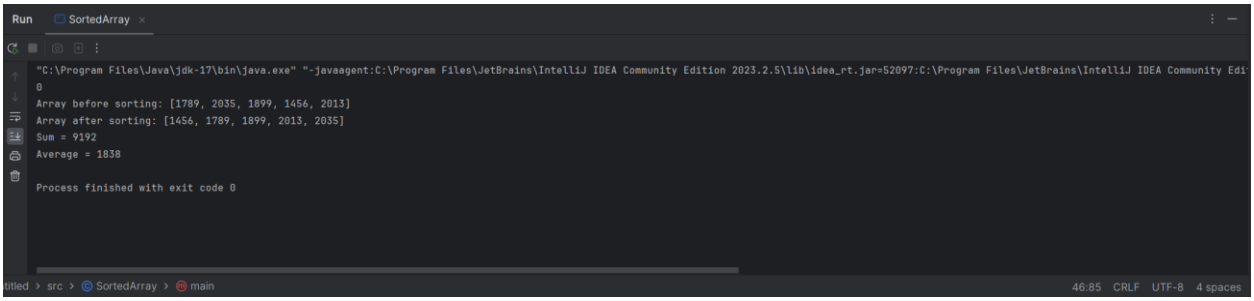
6.5 Write a Java program to sort a numeric array, and calculate the sum and average value of array elements.

```java
import java.util.Scanner;
import javax.swing.JOptionPane;
import java.util.Arrays;
import java.util.jar.Attributes;

new *
public class SortedArray {
    new *
    public static void main(String[] args){
        Object[] options = {"Default", "New Array"};
        int option = JOptionPane.showOptionDialog( parentComponent: null, message: "Do you want to use default array or input a new array?",
                title: "chosing option", JOptionPane.YES_NO_OPTION, JOptionPane.QUESTION_MESSAGE, icon: null, options, initialValue: null);
        System.out.println(option);
        int sum = 0;
        if(option == 0){
            int[] defaultArray = {1789, 2035, 1899, 1456, 2013};
            int n = defaultArray.length;
            System.out.println("Array before sorting: " + Arrays.toString(defaultArray));
            Arrays.sort(defaultArray);
            for(int i = 0; i < n; i++){
                sum += defaultArray[i];
            }
            System.out.println("Array after sorting: " + Arrays.toString(defaultArray));
            System.out.println("Sum = " + sum);
            System.out.println("Average = " + sum/n);
        }else{
            boolean isValid = false;
            int n = 0;
            do{
                String input_n = JOptionPane.showInputDialog( parentComponent: null, message: "Input the size of your array: n = ", title: "Input size", JOp
                try{
                    n = Integer.parseInt(input_n);
                }catch (Exception e){
                    JOptionPane.showMessageDialog( parentComponent: null, message: "The size must be an integer!!!");
                }finally {
                    if(n > 0){
                        isValid = true;
                    }
                }
```

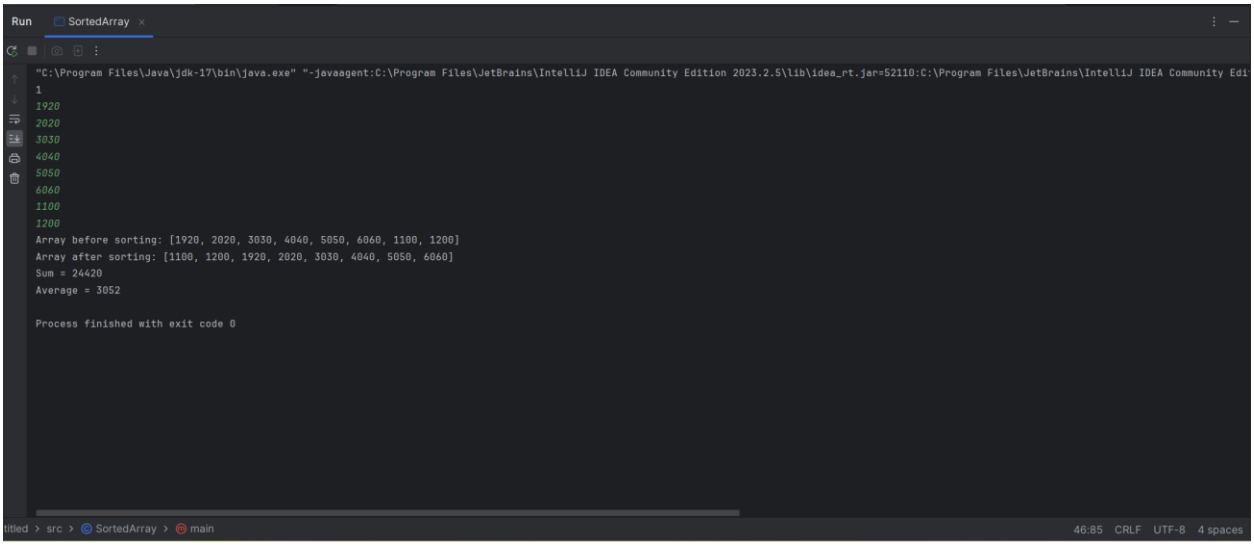
```
            }finally {
                if(n > 0){
                    isValid = true;
                }
            }
        }while (!isValid);

        int[] inputArray = new int[n];
        Scanner sc = new Scanner(System.in);
        for(int i = 0; i < n; i++){
            inputArray[i] = sc.nextInt();
            sum += inputArray[i];
        }
        System.out.println("Array before sorting: " + Arrays.toString(inputArray));
        Arrays.sort(inputArray);
        System.out.println("Array after sorting: " + Arrays.toString(inputArray));
        System.out.println("Sum = " + sum);
        System.out.println("Average = " + sum/n);
    }
}
}
```



1. Default Array



2. Input Array


Run
SortedArray
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.5\lib\idea_rt.jar=52110:C:\Program Files\JetBrains\IntelliJ IDEA Community Edi
1
1920
2020
3030
4040
5050
6060
1100
1200
Array before sorting: [1920, 2020, 3030, 4040, 5050, 6060, 1100, 1200]
Array after sorting: [1100, 1200, 1920, 2020, 3030, 4040, 5050, 6060]
Sum = 24420
Average = 3052
Process finished with exit code 0
itled > src > SortedArray > main
46:85 CRLF UTF-8 4 spaces