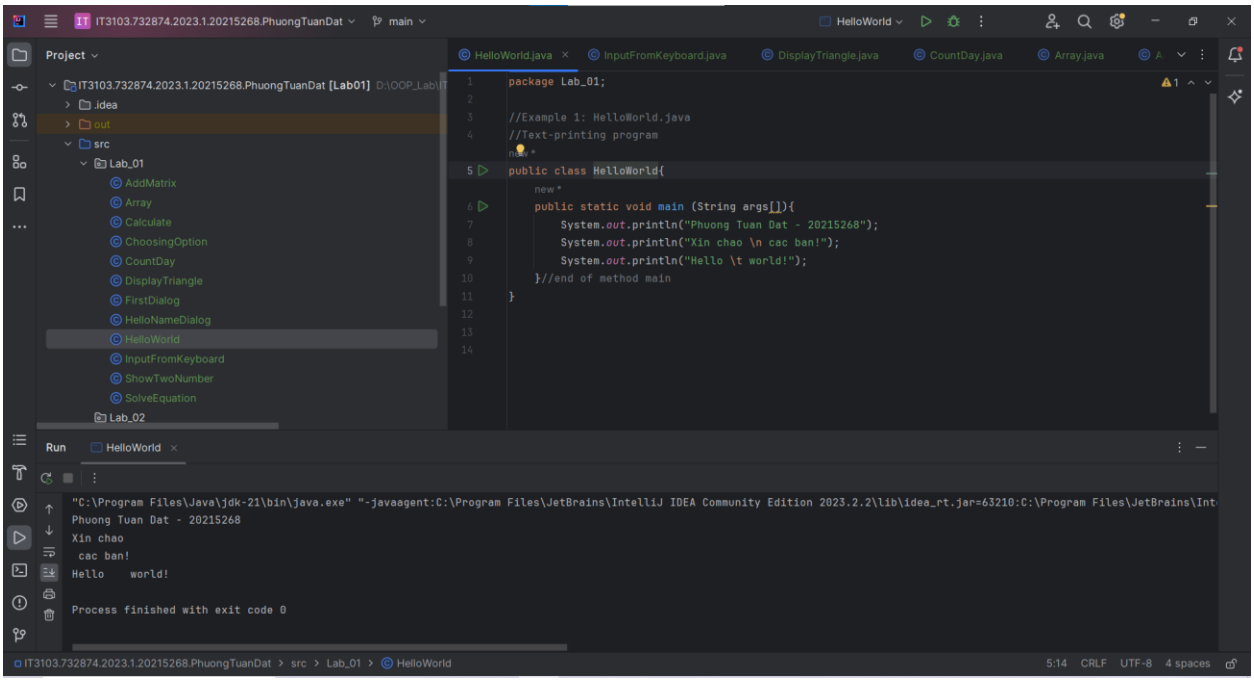
BÁO CÁO THỰC HÀNH LAP 1
LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

The Very First Java Programs

2.2.1 Write, compile the first Java application:

```java
package Lab_01;

//Example 1: HelloWorld.java
//Text-printing program
public class HelloWorld{
    public static void main (String args[]){
        System.out.println("Phuong Tuan Dat - 20215268");
        System.out.println("Xin chao \n cac ban!");
        System.out.println("Hello \t world!");
    }//end of method main
}
```

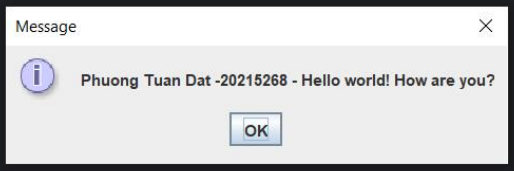
Kết quả



2.2.2 Write, compile the first dialog Java program

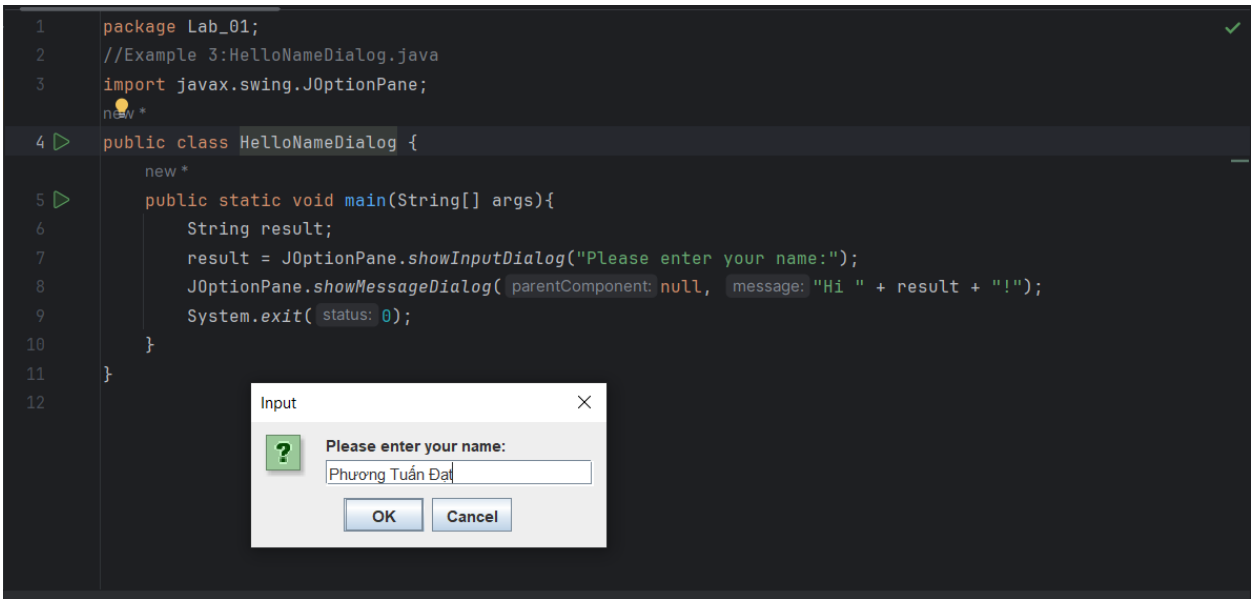
```java
package Lab_01;
//Example 2: FirstDialog.java
import javax.swing.JOptionPane;
new *
public class FirstDialog {

    new *
    public static void main(String[] args){
        JOptionPane.showMessageDialog( parentComponent: null,  message: "Phuong Tuan Dat -20215268 - Hello world!
        System.exit( status: 0);
    }
}
```

```java
package Lab_01;
//Example 2: FirstDialog.java
import javax.swing.JOptionPane;
new *
public class FirstDialog {

    new *
    public static void main(String[] args){
        JOptionPane.showMessageDialog( parentComponent: null,  message: "Phuong Tuan Dat -20215268 - Hello world!
        System.exit( status: 0);
    }
}
```

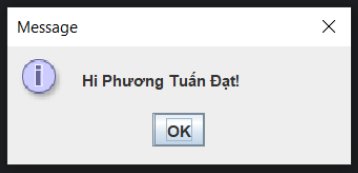


2.2.3 Write, compile the first input dialog Java application

```java
package Lab_01;
//Example 3:HelloNameDialog.java
import javax.swing.JOptionPane;
new *
public class HelloNameDialog {
    new *
    public static void main(String[] args){
        String result;
        result = JOptionPane.showInputDialog("Please enter your name:");
        JOptionPane.showMessageDialog( parentComponent: null,  message: "Hi " + result + "!");
        System.exit( status: 0);
    }
}
```

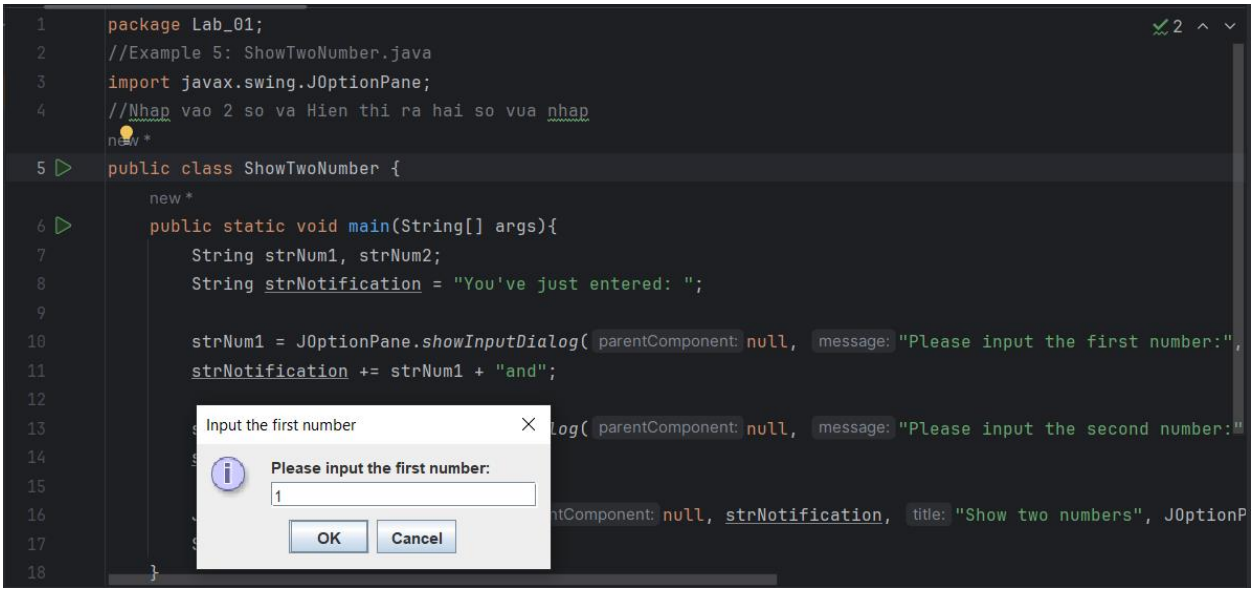


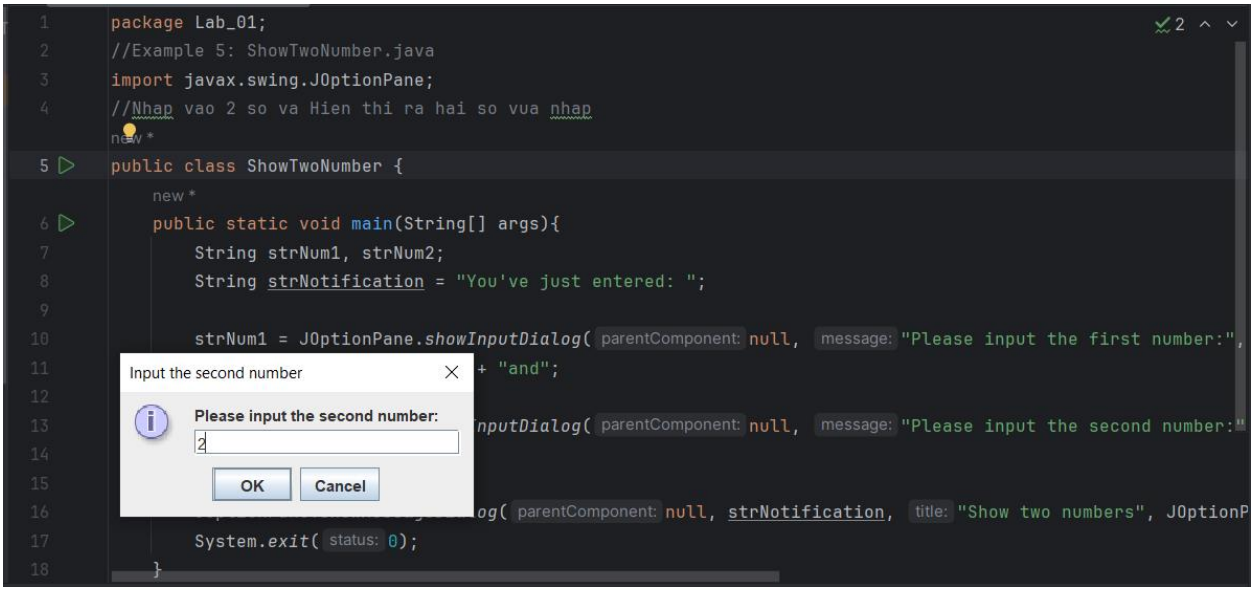
```java
package Lab_01;
//Example 3:HelloNameDialog.java
import javax.swing.JOptionPane;
new *
public class HelloNameDialog {
    new *
    public static void main(String[] args){
        String result;
        result = JOptionPane.showInputDialog("Please enter your name:");
        JOptionPane.showMessageDialog( parentComponent: null,  message: "Hi " + result + "!");
        System.exit( status: 0);
    }
}
```

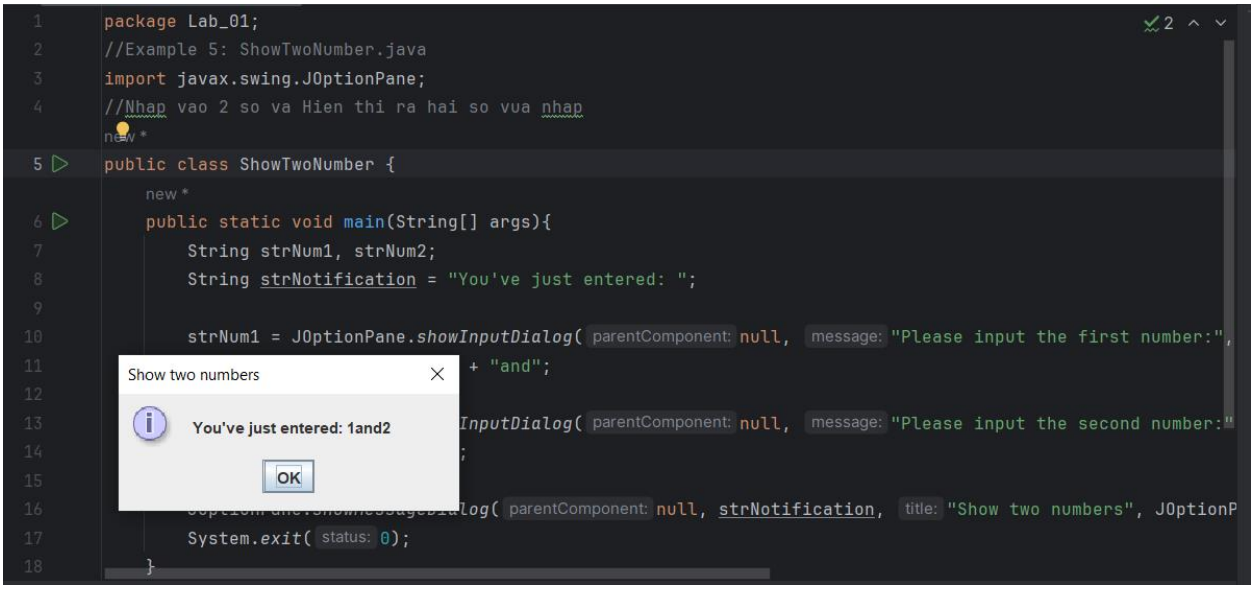


2.2.4 Write, compile, and run the following example:

```java
package Lab_01;
//Example 5: ShowTwoNumber.java
import javax.swing.JOptionPane;
//Nhap vao 2 so va Hien thi ra hai so vua nhap
new *
public class ShowTwoNumber {
    new *
    public static void main(String[] args){
        String strNum1, strNum2;
        String strNotification = "You've just entered: ";

        strNum1 = JOptionPane.showInputDialog( parentComponent: null,  message: "Please input the first number:",
        strNotification += strNum1 + "and";

        strNum2 = JOptionPane.showInputDialog( parentComponent: null,  message: "Please input the second number:",
        strNotification += strNum2;

        JOptionPane.showMessageDialog( parentComponent: null, strNotification,  title: "Show two numbers", JOptionP
        System.exit( status: 0);
    }
```


package Lab_01;
//Example 5: ShowTwoNumber.java
import javax.swing.JOptionPane;
//Nhap vao 2 so va Hien thi ra hai so vua nhap
public class ShowTwoNumber {
public static void main(String[] args){
String strNum1, strNum2;
String strNotification = "You've just entered: ";
strNum1 = JOptionPane.showInputDialog(parentComponent: null, message: "Please input the first number:",
strNotification += strNum1 + "and";
Input the first number
Please input the first number:
1
OK
Cancel


package Lab_01;
//Example 5: ShowTwoNumber.java
import javax.swing.JOptionPane;
//Nhap vao 2 so va Hien thi ra hai so vua nhap
public class ShowTwoNumber {
public static void main(String[] args){
String strNum1, strNum2;
String strNotification = "You've just entered: ";
strNum1 = JOptionPane.showInputDialog(parentComponent: null, message: "Please input the first number:",
Input the second number
Please input the second number:
2
OK
Cancel
System.exit(status: 0);



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

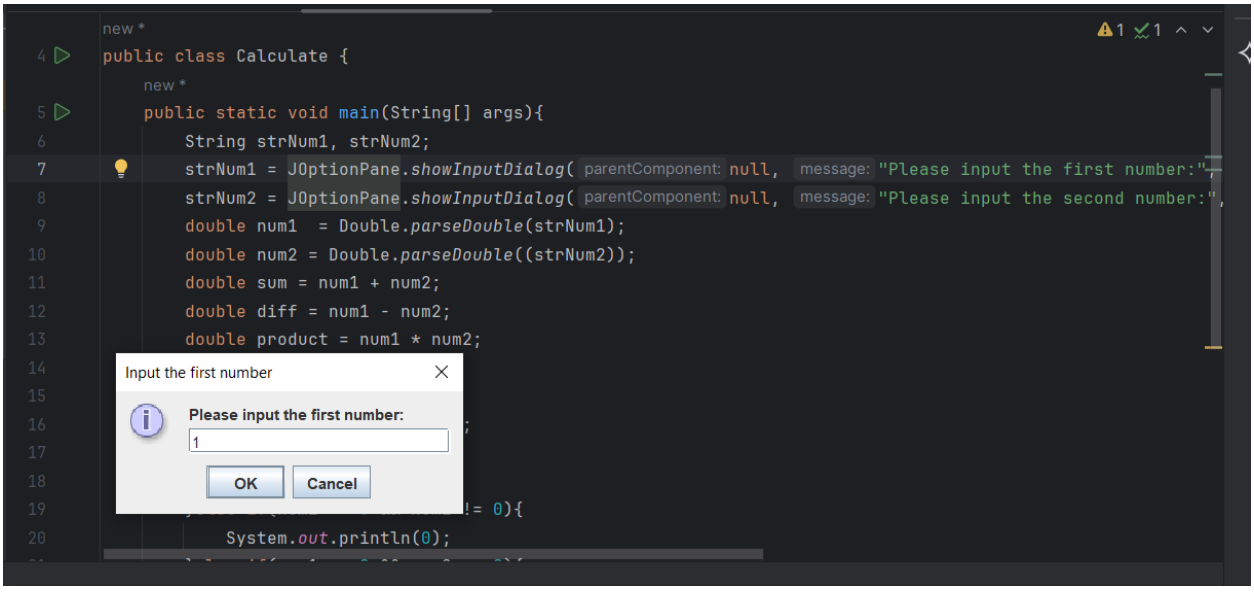
Notes

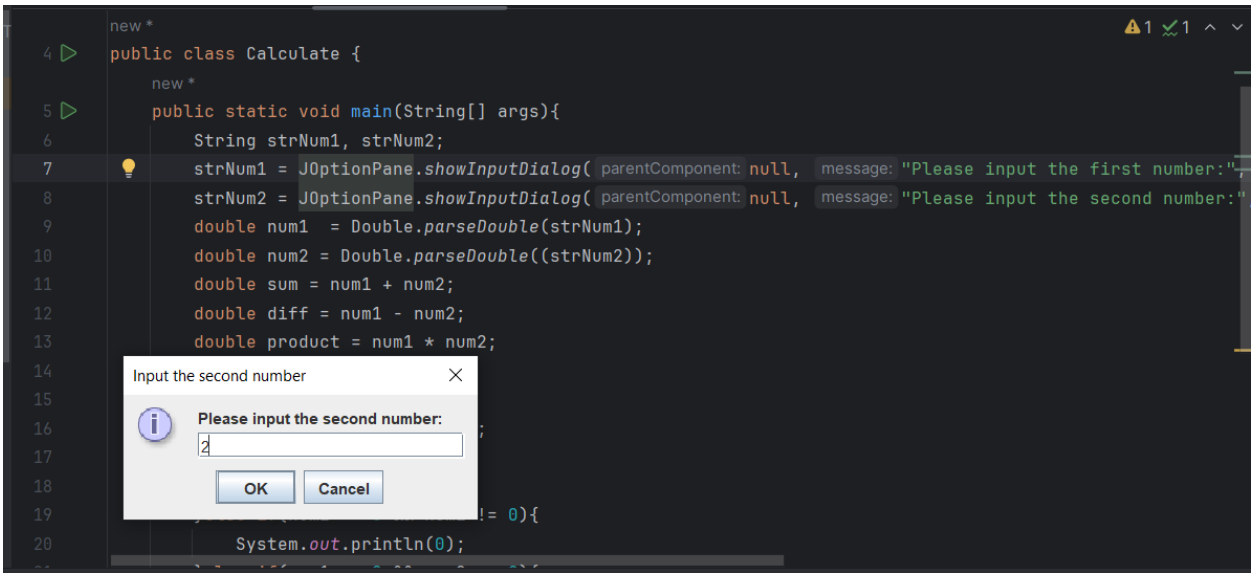
- To convert from String to double, you can use

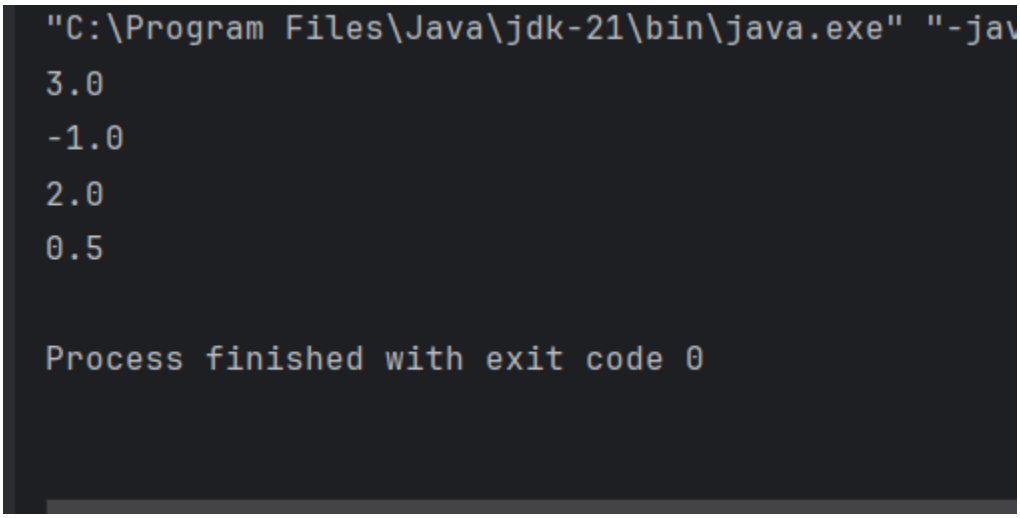
```
double num1 = Double.parseDouble(strNum1)
```

- Check the divisor of the division

```java
package Lab_01;
//Example 6: Calculate.java4
import javax.swing.JOptionPane;
new *
public class Calculate {
    new *
    public static void main(String[] args){
        String strNum1, strNum2;
        strNum1 = JOptionPane.showInputDialog( parentComponent: null,  message: "Please input the first number:");
        strNum2 = JOptionPane.showInputDialog( parentComponent: null,  message: "Please input the second number:");
        double num1  = Double.parseDouble(strNum1);
        double num2 = Double.parseDouble((strNum2));
        double sum = num1 + num2;
        double diff = num1 - num2;
        double product = num1 * num2;
        System.out.println(sum);
        System.out.println(diff);
        System.out.println(product);
        if(num1 == 0 && num2 != 0){
            System.out.println(0);
        }else if(num2 == 0 && num1 != 0){
            System.out.println(0);
        }else if(num1 == 0 && num2 == 0){
            System.out.println("Error! The quotidien does not exist");
        }else{
            double a = num1/num2;
            System.out.println(a);
        }

    }
}
```




new *
public class Calculate {
new *
public static void main(String[] args){
String strNum1, strNum2;
strNum1 = JOptionPane.showInputDialog(parentComponent: null, message: "Please input the first number:";
strNum2 = JOptionPane.showInputDialog(parentComponent: null, message: "Please input the second number:"
double num1 = Double.parseDouble(strNum1);
double num2 = Double.parseDouble((strNum2));
double sum = num1 + num2;
double diff = num1 - num2;
double product = num1 * num2;
Input the second number
Please input the second number:
2
OK
Cancel
!= 0){
System.out.println(0);


"C:\Program Files\Java\jdk-21\bin\java.exe" "-jav
3.0
-1.0
2.0
0.5
Process finished with exit code 0

2.2.6 Write a program to solve

```java
package Lab_01;
//Example 7: SolveEquation.java4

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

        System.out.println("Choose the type of equation to solve:");
        System.out.println("1. First-degree equation with one variable");
        System.out.println("2. System of first-degree equations with two variables");
        System.out.println("3. Second-degree equation with one variable");
        int choice = scanner.nextInt();

        switch (choice) {
            case 1:
                System.out.print("Enter the value of a: ");
                double a = scanner.nextDouble();
                System.out.print("Enter the value of b: ");
                double b = scanner.nextDouble();
                solveLinearEquation(a, b);
                break;
            case 2:
                System.out.print("Enter the value of a11: ");
                double a11 = scanner.nextDouble();
                System.out.print("Enter the value of a12: ");
                double a12 = scanner.nextDouble();
                System.out.print("Enter the value of b1: ");
                double b1 = scanner.nextDouble();
```

```
                System.out.print("Enter the value of a21: ");
                double a21 = scanner.nextDouble();
                System.out.print("Enter the value of a22: ");
                double a22 = scanner.nextDouble();
                System.out.print("Enter the value of b2: ");
                double b2 = scanner.nextDouble();
                solveLinearSystem(a11, a12, b1, a21, a22, b2);
                break;
            case 3:
                System.out.print("Enter the value of a: ");
                double quadraticA = scanner.nextDouble();
                System.out.print("Enter the value of b: ");
                double quadraticB = scanner.nextDouble();
                System.out.print("Enter the value of c: ");
                double quadraticC = scanner.nextDouble();
                solveQuadraticEquation(quadraticA, quadraticB, quadraticC);
                break;
            default:
                System.out.println("Invalid choice");
        }
    }

    1 usage  new *
    public static void solveLinearEquation(double a, double b) {
        if (a == 0) {
            if (b == 0) {
                System.out.println("Infinite solutions");
            } else {
                System.out.println("No solution");
            }
        } else {
```

```
        } else {
            double x = -b / a;
            System.out.println("The solution is x = " + x);
        }
    }

    1 usage  new *
    public static void solveLinearSystem(double a11, double a12, double b1, double a21, double a22, double b2
        double determinant = a11 * a22 - a21 * a12;
        if (determinant == 0) {
            if ((b1 * a22 - b2 * a12) == 0) {
                System.out.println("Infinite solutions");
            } else {
                System.out.println("No solution");
            }
        } else {
            double x1 = (b1 * a22 - b2 * a12) / determinant;
            double x2 = (a11 * b2 - a21 * b1) / determinant;
            System.out.println("The solutions are x1 = " + x1 + ", x2 = " + x2);
        }
    }

    1 usage  new *
    public static void solveQuadraticEquation(double a, double b, double c) {
        double discriminant = b * b - 4 * a * c;
        if (discriminant > 0) {
            double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);
            double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);
            System.out.println("The solutions are real and distinct: x1 = " + root1 + ", x2 = " + root2);
        } else if (discriminant == 0) {
            double root = -b / (2 * a);
```

```
            System.out.println("The solution is a double root: x = " + root);
        } else {
            System.out.println("No real roots");
        }
    }
}
```

```
1. First-degree equation with one variable
2. System of first-degree equations with two variables
3. Second-degree equation with one variable
1
Enter the value of a: 3
Enter the value of b: 3
The solution is x = -1.0

Process finished with exit code 0
```

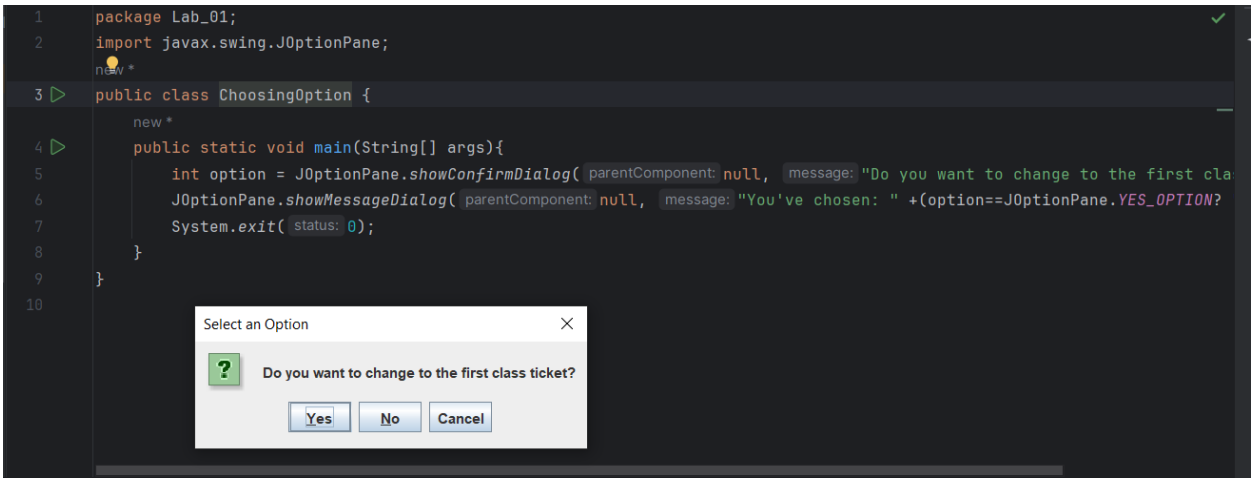
```
Build   System of first-degree equations with two variables
        3. Second-degree equation with one variable
        2
        Enter the value of a11: 1
        Enter the value of a12: 1
        Enter the value of b1: 1
        Enter the value of a21: 1
        Enter the value of a22: 3
        Enter the value of b2: 2
        The solutions are x1 = 0.5, x2 = 0.5
```

Exercises

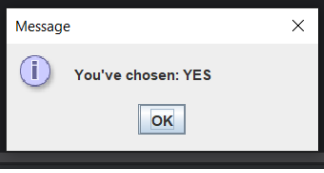
6.1 Write, compile and run the ChoosingOption program:

```java
package Lab_01;
import javax.swing.JOptionPane;
new *
public class ChoosingOption {
    new *
    public static void main(String[] args){
        int option = JOptionPane.showConfirmDialog( parentComponent: null, message: "Do you want to change to the first class ticket?");
        JOptionPane.showMessageDialog( parentComponent: null, message: "You've chosen: " +(option==JOptionPane.YES_OPTION? "YES":"NO"));
        System.exit( status: 0);
    }
}
```

Kết quả:



```java
package Lab_01;
import javax.swing.JOptionPane;
new *
public class ChoosingOption {
    new *
    public static void main(String[] args){
        int option = JOptionPane.showConfirmDialog( parentComponent: null,  message: "Do you want to change to the first cla
        JOptionPane.showMessageDialog( parentComponent: null,  message: "You've chosen: " +(option==JOptionPane.YES_OPTION?
        System.exit( status: 0);
    }
}
```



6.2 Write a program for input/output from keyboard

```java
package Lab_01;
import  java.util.Scanner;
new *
public class InputFromKeyboard {
    new *
    public static void main (String[] args){
        Scanner keyboard = new Scanner(System.in);

        System.out.println("What's your name?");
        String strName = keyboard.nextLine();
        int iAge = keyboard.nextInt();
        System.out.println("How tall are you (m)?");
        double dHeight = keyboard.nextDouble();

        //similar to other data type
        //nextByte(), nextShort(), nextLong(), nextFloat(), nextBoolean()

        System.out.println("Mrs/Mr" + strName + "," + iAge + " years old. " + "Your height is " +dHeight + ".   ");
    }
}
```

Kết quả:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-java
What's your name?
Dat
20
How tall are you (m)?
1.72
Mrs/MrDat,20 years old. Your height is 1.72.

Process finished with exit code 0
```

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

```java
package Lab_01;
import java.util.Scanner;
new *
public class DisplayTriangle {
    new *
    public static void main(String[] args){
        Scanner keyboard = new Scanner(System.in);
        System.out.println("Hãy nhập số n");
        int n = keyboard.nextInt();
        int m = 1;
        for(int i = 0; i < n; i ++){
            for(int k = 0; k < n - i ; k++){
                System.out.print(" ");
            }
            for(int j = 0; j < m; j++){
                System.out.print("*");
            }
            System.out.print("\n");
            m += 2;
        }
    }
}
```

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

```java
package Lab_01;
import java.util.Scanner;
new *
public class CountDay {
    new *
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        int year;
        String monthInput;
        int month = 0;

        while (true) {
            System.out.print("Enter a year: ");
            if (scanner.hasNextInt()) {
                year = scanner.nextInt();
                if (year >= 0) {
                    break;
                }
            }
            System.out.println("Invalid year input. Please try again.");
            scanner.nextLine();
        }

        scanner.nextLine();  // Consume the newline character left by nextInt()

        while (true) {
            System.out.print("Enter a month: ");
            monthInput = scanner.nextLine().trim().toLowerCase();
```

```
switch (monthInput) {
    case "january":
    case "jan.":
    case "jan":
    case "1":
        month = 1;
        break;
    case "february":
    case "feb.":
    case "feb":
    case "2":
        month = 2;
        break;
    case "march":
    case "mar.":
    case "mar":
    case "3":
        month = 3;
        break;
    case "april":
    case "apr.":
    case "apr":
    case "4":
        month = 4;
        break;
    case "may":
    case "5":
        month = 5;
        break;
    case "june":
```

```
    case "jun.":
    case "jun":
    case "6":
        month = 6;
        break;
    case "july":
    case "jul.":
    case "jul":
    case "7":
        month = 7;
        break;
    case "august":
    case "aug.":
    case "aug":
    case "8":
        month = 8;
        break;
    case "september":
    case "sep.":
    case "sep":
    case "9":
        month = 9;
        break;
    case "october":
    case "oct.":
    case "oct":
    case "10":
        month = 10;
        break;
    case "november":
```

```
            case "nov.":
            case "nov":
            case "11":
                month = 11;
                break;
            case "december":
            case "dec.":
            case "dec":
            case "12":
                month = 12;
                break;
            default:
                System.out.println("Invalid month input. Please try again.");
                continue;
        }

        break;
    }

    boolean isLeapYear = (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);

    int daysInMonth;
    switch (month) {
        case 4:
        case 6:
        case 9:
        case 11:
            daysInMonth = 30;
            break;
        case 2:
```

```
            case 2:
                daysInMonth = isLeapYear ? 29 : 28;
                break;
            default:
                daysInMonth = 31;
        }

        System.out.println("There are " + daysInMonth + " days in " + monthInput + " " + year + ".");
    }
}
```

Kết quả:

```
"C:\Program Files\Java\jdk-21\bin\java.exe"
Enter a year: 2023
Enter a month: feb
There are 28 days in feb 2023.

Process finished with exit code 0
```

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

```java
package Lab_01;
import ...
new *
public class Array {
    new *
    public static void main(String[] args){
        double []a = new double[]{1789, 2035, 1899, 1456, 2013};
        double sum = 0;
        for(double number: a){
            sum += number;
        }
        double average = sum / a.length;
        Arrays.sort(a);
        System.out.println("Array after sort: ");
        System.out.println(Arrays.toString(a));

        System.out.println("Sum of this array: ");
        System.out.println(sum);

        System.out.println("Average of this array: ");
        System.out.println(average);
    }
}
```

Kết quả:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Pr
Array after sort:
[1456.0, 1789.0, 1899.0, 2013.0, 2035.0]
Sum of this array:
9192.0
Average of this array:
1838.4

Process finished with exit code 0
```

6.6 Write a Java program to add two matrices of the same size.

```java
package Lab_01;
import java.util.Scanner;
new *
public class AddMatrix {
    3 usages  new *
    public static void print(int [][]matrix){
        for(int i = 0; i < 3; i++){
            for(int j = 0; j < 3; j++){
                System.out.print(matrix[i][j]);
                System.out.print(" ");
            }
            System.out.println();
        }
    }
    new *
```

```java
public static void main(String[] args){
    int [][]matrix1 = new int[3][3];
    int [][]matrix2 = new int[3][3];
    int [][]matrix3 = new int[3][3];
    for(int i = 0; i < 3; i++){
        for(int j = 0; j < 3; j++){
            matrix1[i][j] = i + j;
            matrix2[i][j] = i - j;
            matrix3[i][j] = matrix1[i][j] + matrix2[i][j];
        }
    }
    System.out.println("Matrix 1: ");
    print(matrix1);

    System.out.println("Matrix 2: ");
    print(matrix2);

    System.out.println("Matrix 3: ");
    print(matrix3);

}
}
```

Kết quả:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-
Matrix 1:
0 1 2
1 2 3
2 3 4
Matrix 2:
0 -1 -2
1 0 -1
2 1 0
Matrix 3:
0 0 0
2 2 2
4 4 4

Process finished with exit code 0
```