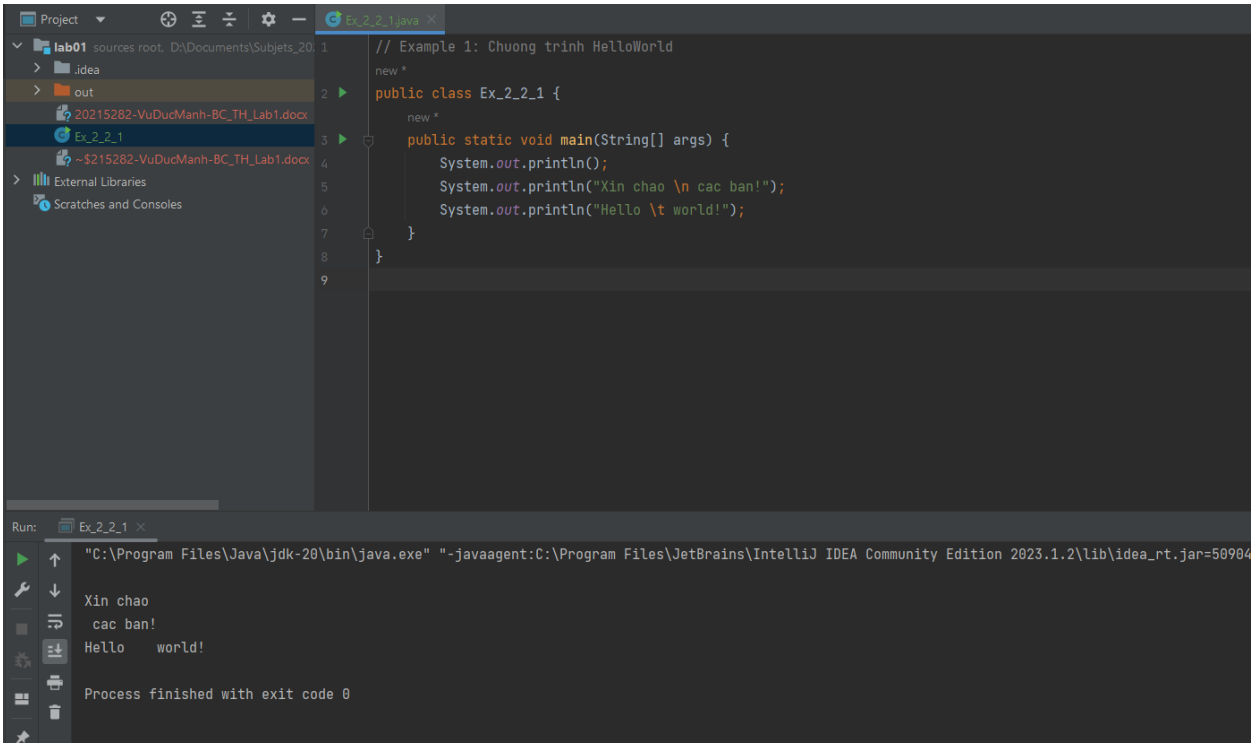
BÁO CÁO THỰC HÀNH LAP 1
LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

Part I. The Very First Java Programs

2.2.1 Write, compile the first Java application:

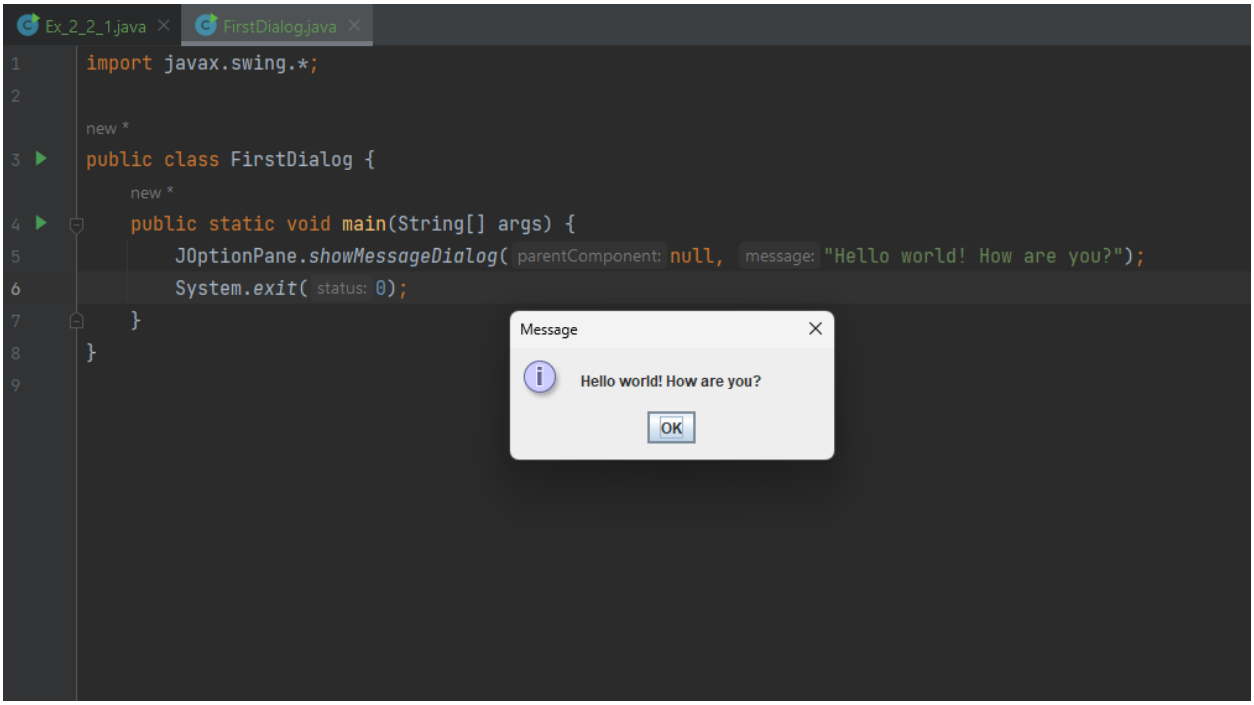
```java
//Example 1: HelloWorld.java
//Text-printing program
public class HelloWorld {

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

   } // end of method main
}
```

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);
    }
}
```

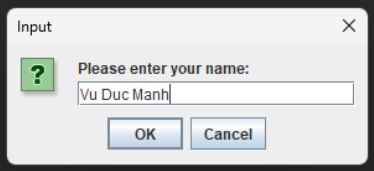


2.2.3 Write, compile the first input dialog Java application

```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);
  }
}
```

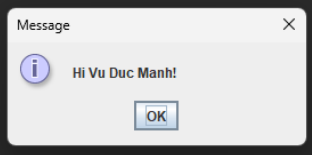
Ex_2_2_1.java FirstDialog.java HelloNameDialog.java

```java
import javax.swing.*;

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);
    }
}
```



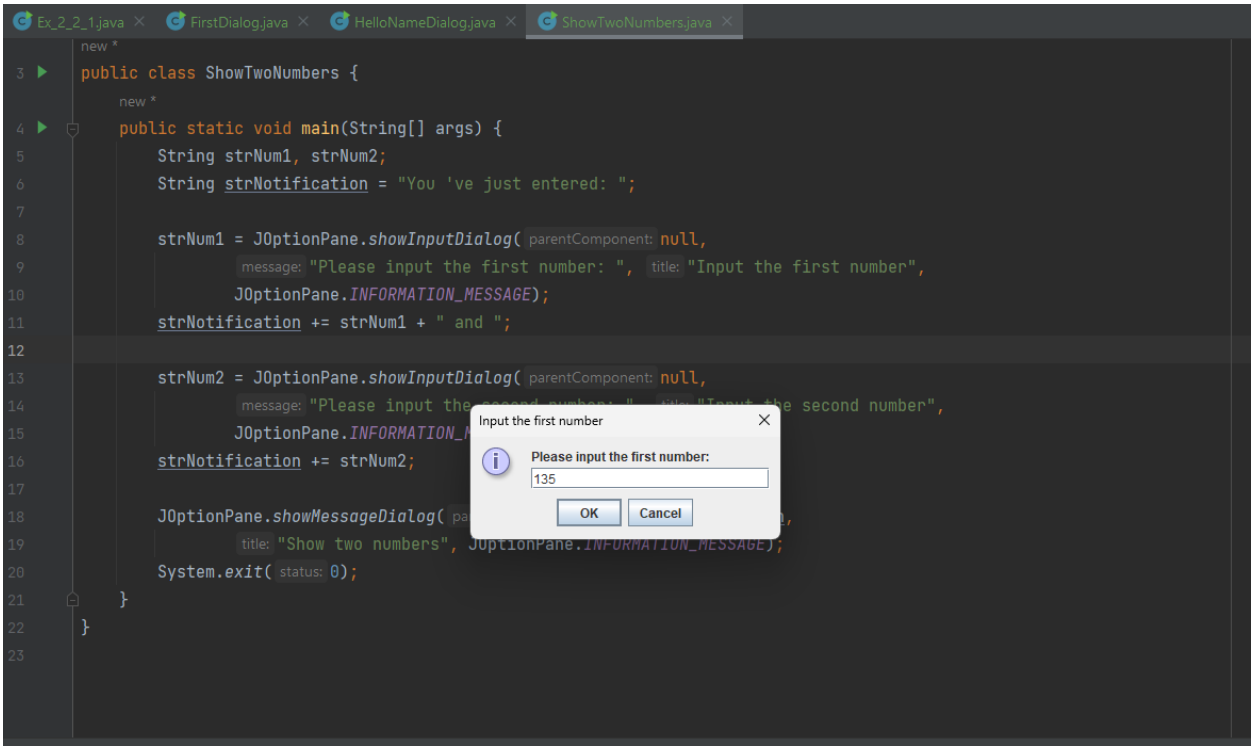
Ex_2_2_1.java FirstDialog.java HelloNameDialog.java

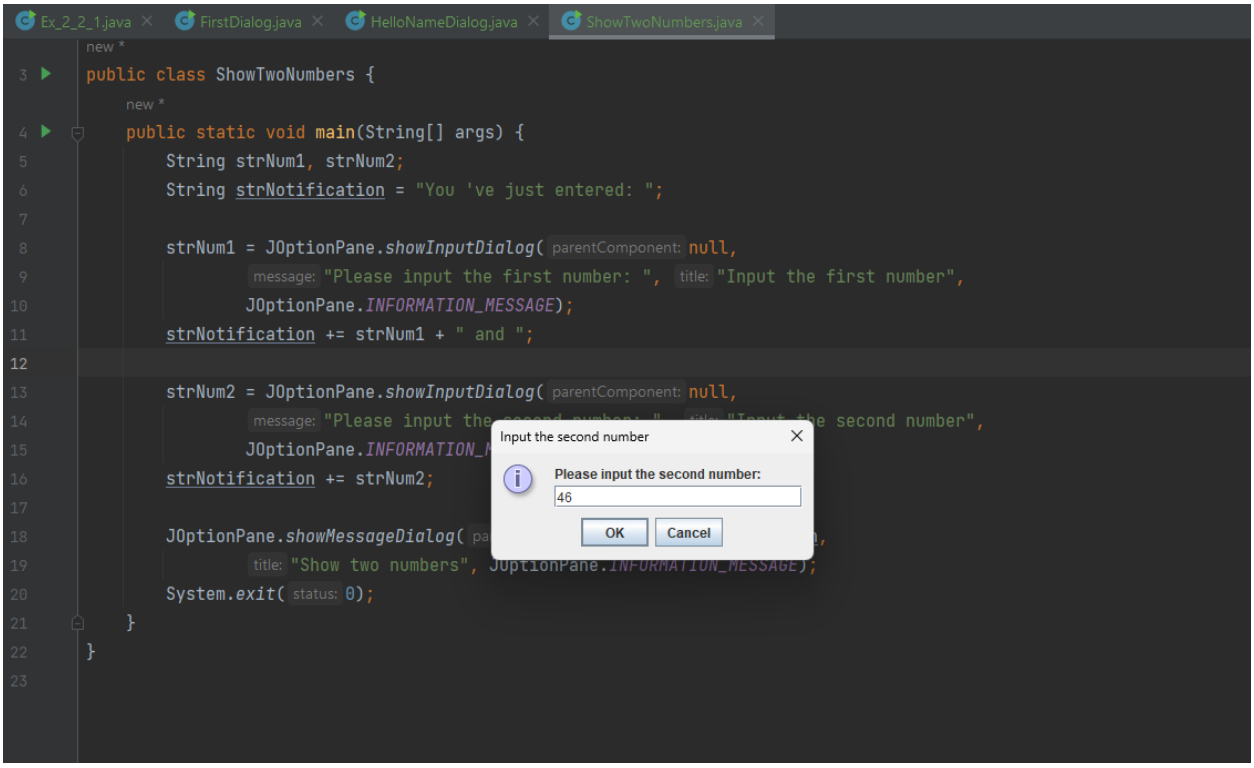
```java
import javax.swing.*;

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);
    }
}
```

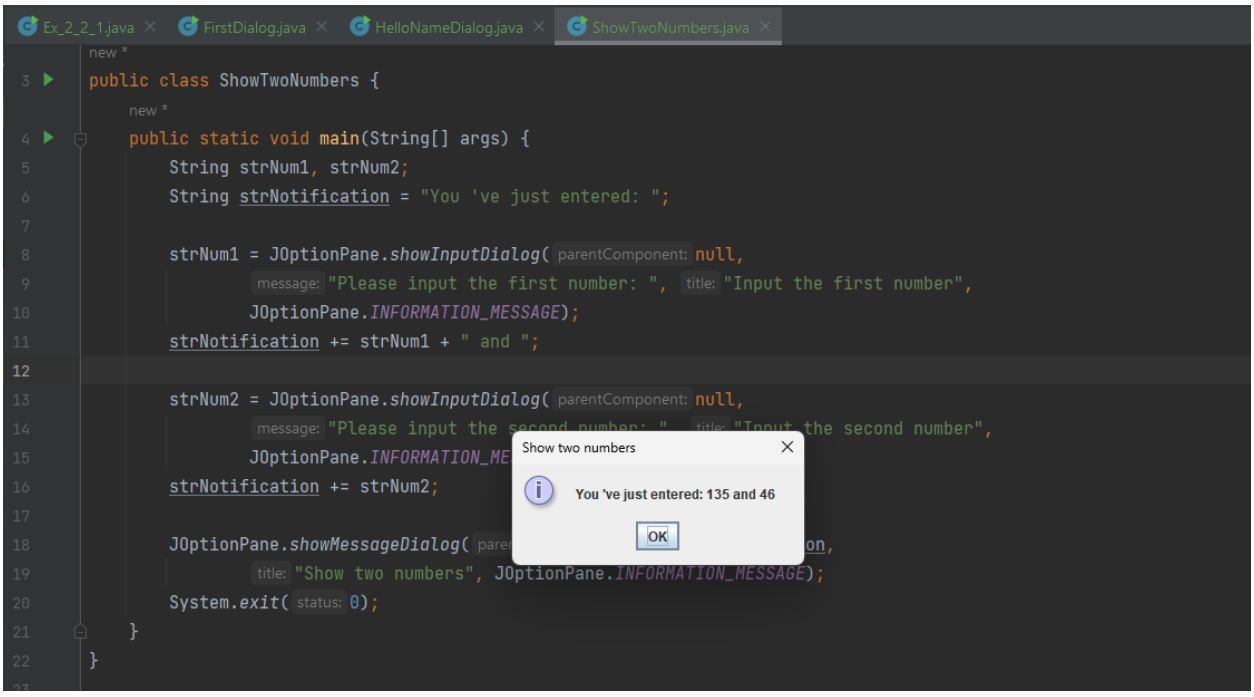


2.2.4 Write, compile, and run the following example:

```java
// 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);
  }
}
```



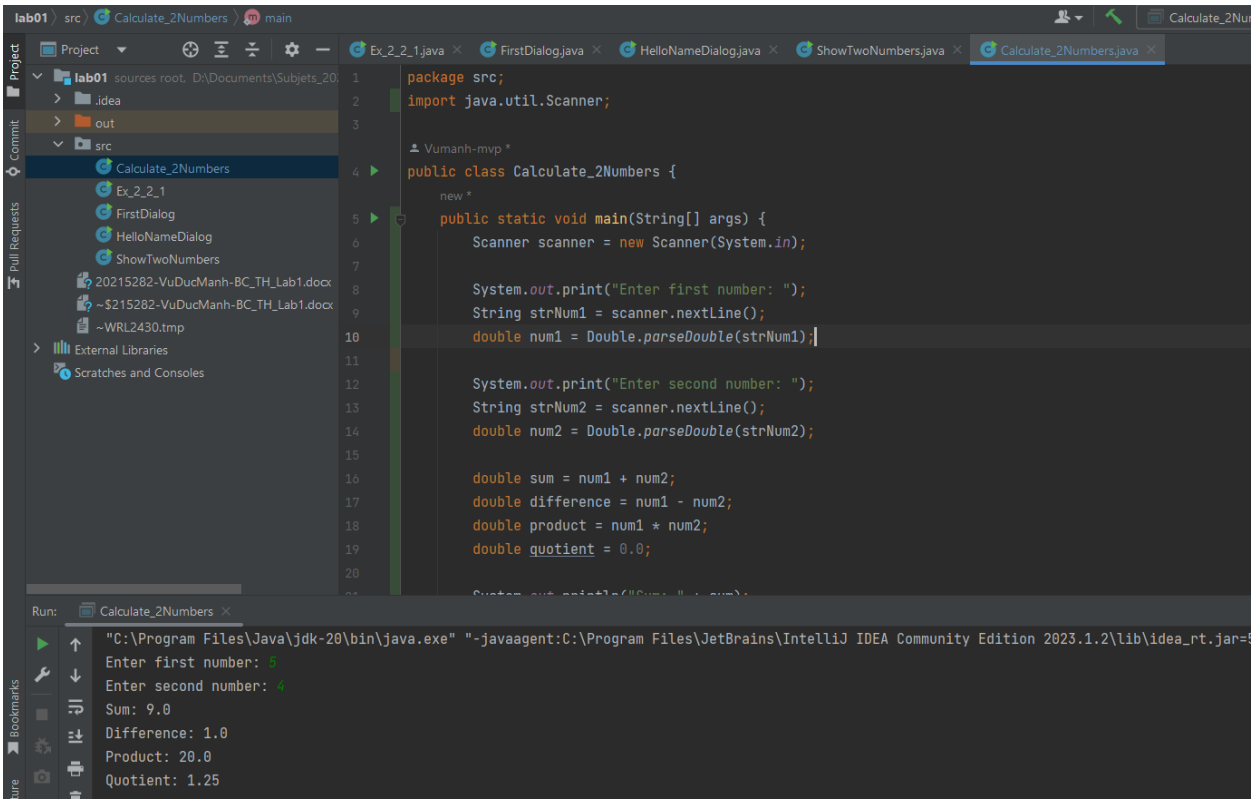

Ex_2_2_1.java
FirstDialog.java
HelloNameDialog.java
ShowTwoNumbers.java
new *
public class ShowTwoNumbers {
new *
public static void main(String[] args) {
String strNum1, strNum2;
String strNotification = "You 've just entered: ";
strNum1 = JOptionPane.showInputDialog(parentComponent: null,
message: "Please input the first number: ", title: "Input the first number",
JOptionPane.INFORMATION_MESSAGE);
strNotification += strNum1 + " and ";
strNum2 = JOptionPane.showInputDialog(parentComponent: null,
JOptionPane.INFORMATION_M
strNotification += strNum2;
JOptionPane.showMessageDialog(pa
title: "Show two numbers", JOptionPane.INFORMATION_MESSAGE);
System.exit(status: 0);
}
}
Input the second number
Please input the second number:
46
OK
Cancel

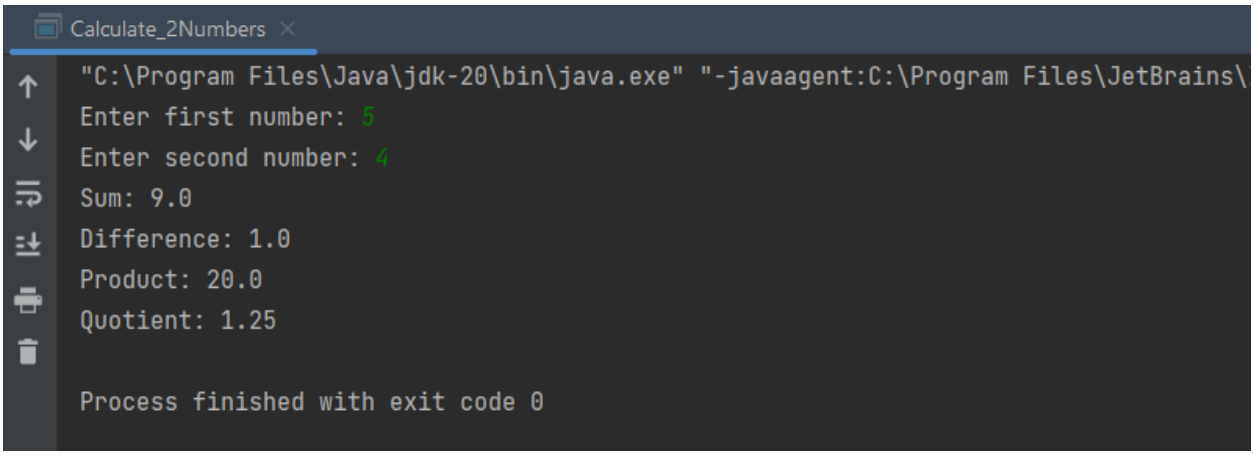

Ex_2_2_1.java
FirstDialog.java
HelloNameDialog.java
ShowTwoNumbers.java
new *
public class ShowTwoNumbers {
new *
public static void main(String[] args) {
String strNum1, strNum2;
String strNotification = "You 've just entered: ";
strNum1 = JOptionPane.showInputDialog(parentComponent: null,
message: "Please input the first number: ", title: "Input the first number",
JOptionPane.INFORMATION_MESSAGE);
strNotification += strNum1 + " and ";
strNum2 = JOptionPane.showInputDialog(parentComponent: null,
JOptionPane.INFORMATION_ME
strNotification += strNum2;
JOptionPane.showMessageDialog(pare
title: "Show two numbers", JOptionPane.INFORMATION_MESSAGE);
System.exit(status: 0);
}
}
Show two numbers
You 've just entered: 135 and 46
OK

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





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

```java
package src;
import java.util.Scanner;

new *
public class Ex_2_2_6 {
    new *
    public static void main(String[] args) {
        System.out.println("----------Menu----------\n" +
                "1. The first-degree equation with one variable\n" +
                "2. The system of first-degree equations with two variables\n" +
                "3. The second-degree equation with one variable");
        Scanner sc = new Scanner(System.in);

        while(true){
            System.out.print("Enter your choice: ");
            int cmd = sc.nextInt();
            if (cmd == 1) {
                solveFirstDegreeEquation();
            } else if (cmd == 2) {
                solveSystemOfFirstDegreeEquations();
            } else if (cmd == 3) {
                solveSecondDegreeEquation();
            } else {
                System.out.println("Invalid choice. Finished!");
            }
        }
    }
```

```java
public static void solveFirstDegreeEquation() {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the value of a: ");
    double a = sc.nextDouble();
    System.out.print("Enter the value of b: ");
    double b = sc.nextDouble();

    if (a == 0) {
        System.out.println("The equation is not of the first degree.");
    } else {
        double x = -b / a;
        System.out.println("The solution is x = " + x);
    }
}
```

```java
public static void solveSystemOfFirstDegreeEquations() {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the coefficients a11, a12, b1, a21, a22, b2: ");
    double a11 = sc.nextDouble();
    double a12 = sc.nextDouble();
    double b1 = sc.nextDouble();
    double a21 = sc.nextDouble();
    double a22 = sc.nextDouble();
    double b2 = sc.nextDouble();

    double D = a11 * a22 - a21 * a12;
    double D1 = b1 * a22 - b2 * a12;
    double D2 = a11 * b2 - a21 * b1;

    if (D != 0) {
        double x1 = D1 / D;
        double x2 = D2 / D;
        System.out.println("The solution is x1 = " + x1 + ", x2 = " + x2);
    } else {
        if (D1 == 0 && D2 == 0) {
            System.out.println("The system has infinitely many solutions.");
        } else {
            System.out.println("The system has no solution.");
        }
    }
}
```

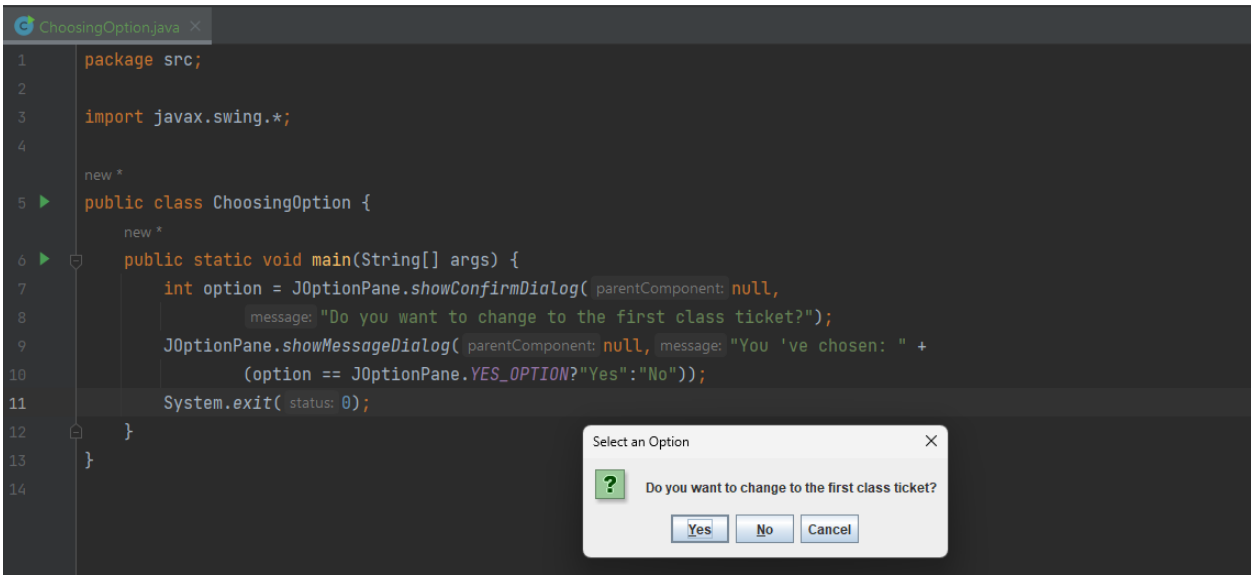
```java
public static void solveSecondDegreeEquation() {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the value of a: ");
    double a = sc.nextDouble();
    System.out.print("Enter the value of b: ");
    double b = sc.nextDouble();
    System.out.print("Enter the value of c: ");
    double c = sc.nextDouble();

    double discriminant = b * b - 4 * a * c;

    if (a == 0) {
        System.out.println("The equation is not a second-degree equation.");
    } else if (discriminant > 0) {
        double x1 = (-b + Math.sqrt(discriminant)) / (2 * a);
        double x2 = (-b - Math.sqrt(discriminant)) / (2 * a);
        System.out.println("The solutions are x1 = " + x1 + ", x2 = " + x2);
    } else if (discriminant == 0) {
        double x = -b / (2 * a);
        System.out.println("The solution is a double root: x = " + x);
    } else {
        System.out.println("The equation has no real roots.");
    }
}
```

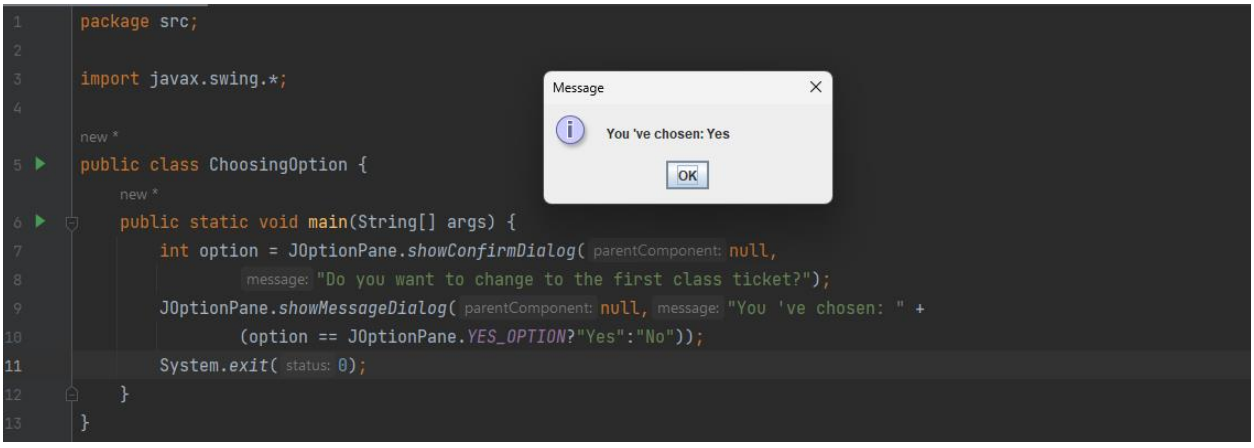
Part II: 6. Exercises:

6.1. Write, compile, and run the Choosing Option program:

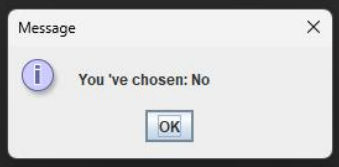
ChoosingOption.java

```
package src;

import javax.swing.*;

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);
    }
}
```





```java
package src;

import javax.swing.*;

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);
    }
}
```



- Nếu người dùng chọn "Cancel", thì biến **option** sẽ nhận giá trị **JOptionPane.CANCEL_OPTION**. Sau đó, thông điệp "You've chosen: No" sẽ được hiển thị
- Sửa với 4 options: "Yes", "No", "I do", "I don't".

```java
public static void main(String[] args) {
    String[] options = {"Yes", "No", "I do", "I don't"};
    int option = JOptionPane.showOptionDialog( parentComponent: null, message: "Enter your choice:", title: "User's choice",
            JOptionPane.YES_NO_OPTION, JOptionPane.QUESTION_MESSAGE, icon: null, options, options[0]);
    if (option >= 0) {
        JOptionPane.showMessageDialog( parentComponent: null, message: "You've chosen: " + options[option]);
    } else {
        JOptionPane.showMessageDialog( parentComponent: null, message: "You've closed the dialog .");
    }
    System.exit( status: 0);
}
```

6.2. Write a program for input/output from keyboard

ChoosingOption.java | ChoosingOption_Fix.java | InputFromKeyboard.java

```java
package src;

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();
        System.out.println("Hold old are you?");
        int iAge = keyboard.nextInt();
        System.out.println("How tall are you (m)?");
        double dHeight = keyboard.nextDouble();

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

Ex_2_2_6 | InputFromKeyboard

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\Intell
What's your name?
Vu Duc Manh
Hold old are you?
20
How tall are you (m)?
175
Mrs/Ms. Vu Duc Manh, 20 years old.Your height is 175.0.
```

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

Ex_2_2_6 | TrianglePattern

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\Intelli
Enter the height of the triangle: 5
    *
   ***
  *****
 *******
*********

Process finished with exit code 0
```

ChoosingOption.java | ChoosingOption_Fix.java | InputFromKeyboard.java | TrianglePattern.java

```java
package src;
import java.util.Scanner;

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

        System.out.print("Enter the height of the triangle: ");
        int n = scanner.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();
        }
        scanner.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.

Ex_2_2_6 | DayInMonth

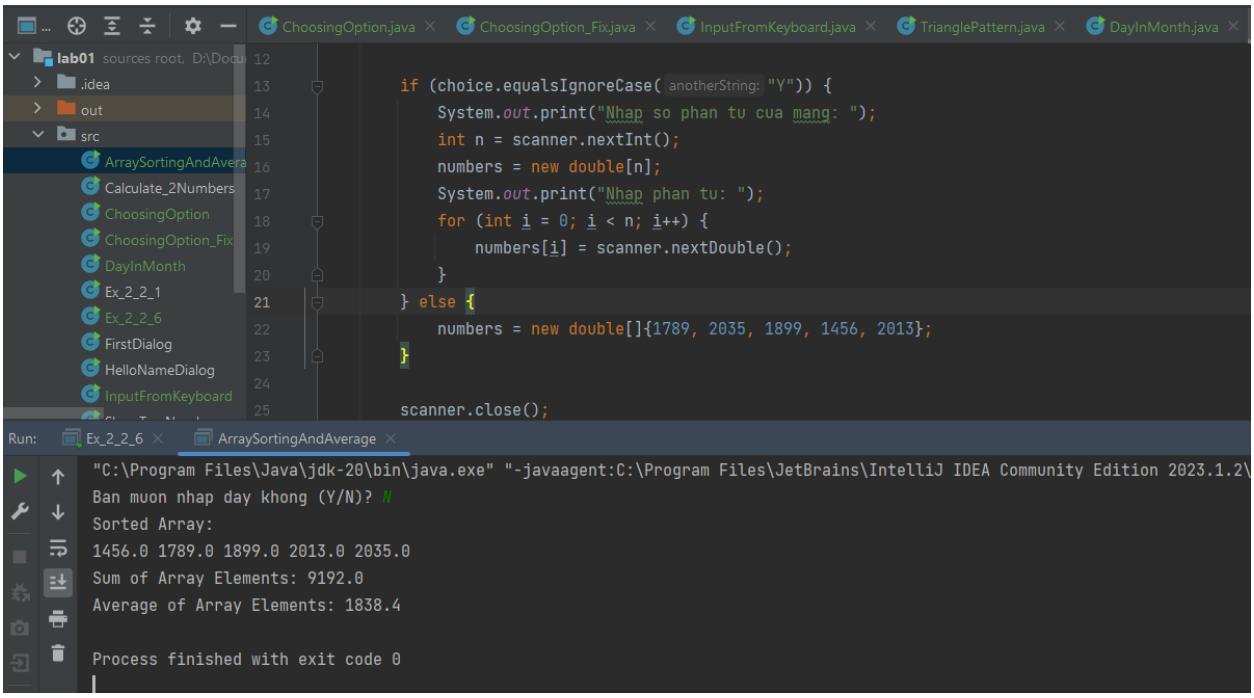
```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\Intell
Nhap thang: jan.
Nhap nam: 2023
There are 31 days in jan. 2023.

Process finished with exit code 0
```

```java
int month;
if (monthInput.equals("january") || monthInput.equals("jan.") || monthInput.equals("jan") || monthInput.equals("1")) {
    month = 1;
} else if (monthInput.equals("february") || monthInput.equals("feb.") || monthInput.equals("feb") || monthInput.equals("2")) {
    month = 2;
} else if (monthInput.equals("march") || monthInput.equals("mar.") || monthInput.equals("mar") || monthInput.equals("3")) {
    month = 3;
} else if (monthInput.equals("april") || monthInput.equals("apr.") || monthInput.equals("apr") || monthInput.equals("4")) {
    month = 4;
} else if (monthInput.equals("may") || monthInput.equals("5")) {
    month = 5;
} else if (monthInput.equals("june") || monthInput.equals("jun.") || monthInput.equals("jun") || monthInput.equals("6")) {
    month = 6;
} else if (monthInput.equals("july") || monthInput.equals("jul.") || monthInput.equals("jul") || monthInput.equals("7")) {
    month = 7;
} else if (monthInput.equals("august") || monthInput.equals("aug.") || monthInput.equals("aug") || monthInput.equals("8")) {
    month = 8;
} else if (monthInput.equals("september") || monthInput.equals("sep.") || monthInput.equals("sep") || monthInput.equals("9")) {
    month = 9;
} else if (monthInput.equals("october") || monthInput.equals("oct.") || monthInput.equals("oct") || monthInput.equals("10")) {
    month = 10;
} else if (monthInput.equals("november") || monthInput.equals("nov.") || monthInput.equals("nov") || monthInput.equals("11")) {
    month = 11;
} else if (monthInput.equals("december") || monthInput.equals("dec.") || monthInput.equals("dec") || monthInput.equals("12")) {
    month = 12;
```

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

```java
if (choice.equalsIgnoreCase( anotherString: "Y")) {
    System.out.print("Nhap so phan tu cua mang: ");
    int n = scanner.nextInt();
    numbers = new double[n];
    System.out.print("Nhap phan tu: ");
    for (int i = 0; i < n; i++) {
        numbers[i] = scanner.nextDouble();
    }
} else {
    numbers = new double[]{1789, 2035, 1899, 1456, 2013};
}

scanner.close();
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.2\lib\idea_rt.jar
Ban muon nhap day khong (Y/N)? Y
Nhap so phan tu cua mang: 5
Nhap phan tu: 5 2 3 1 9
Sorted Array:
1.0 2.0 3.0 5.0 9.0
Sum of Array Elements: 20.0
Average of Array Elements: 4.0
```



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

Note: You must create a new Java project for this exercise.

- The matrices can be entered by the user or constants.