ĐẠI HỌC BÁCH KHOA HÀ NỘI
TRƯỜNG CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG

BÁO CÁO THỰC HÀNH
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BÀI THỰC HÀNH 01

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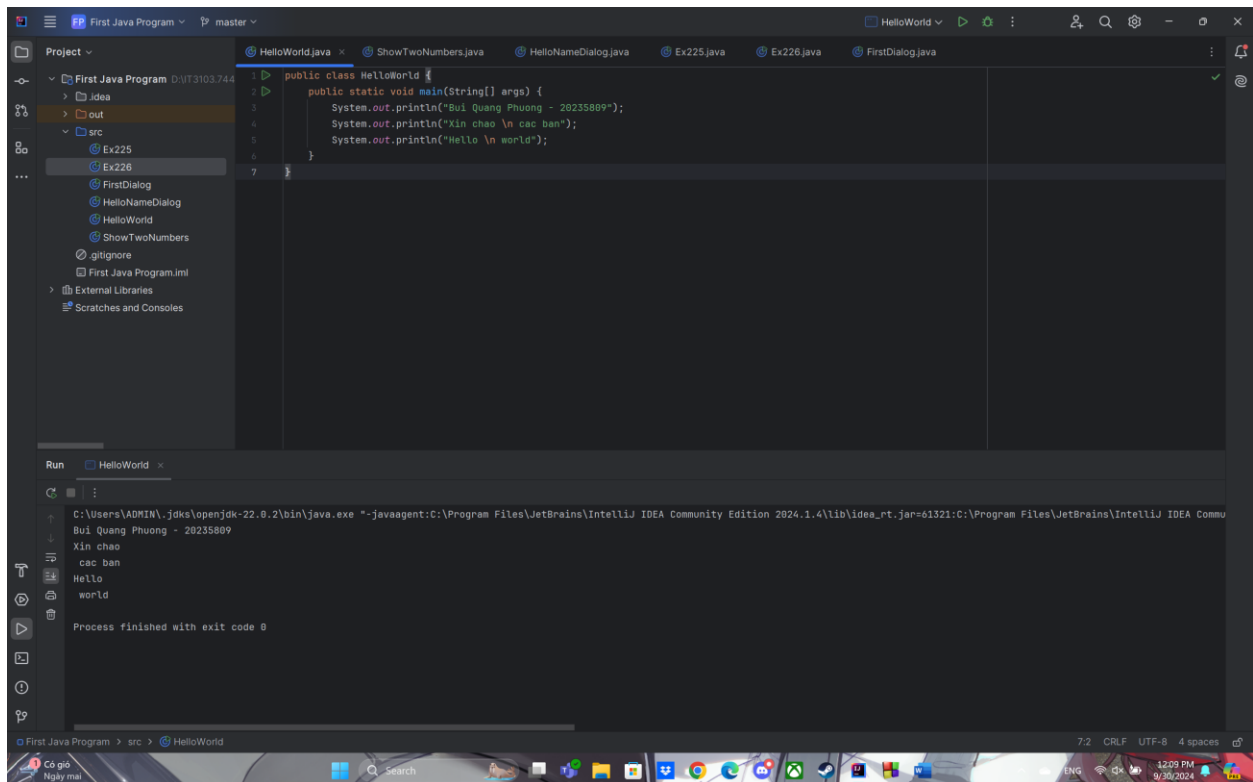
Hà Nội 9/2024

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BÁO CÁO THỰC HÀNH LAB 1

The Very First Java Programs

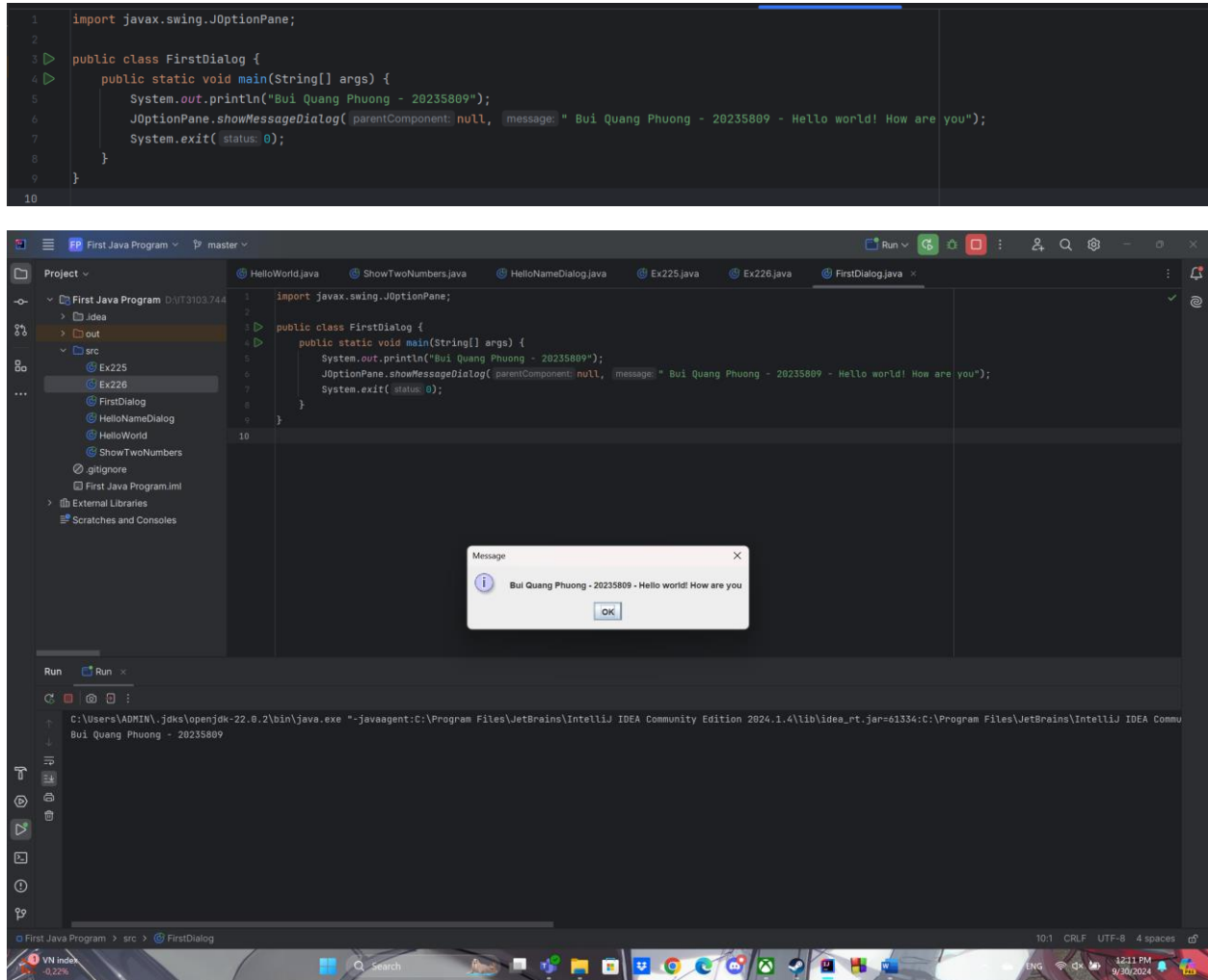*2.2.1* Write, compile the first Java application:

```java
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        System.out.println("Xin chao \n cac ban");
        System.out.println("Hello \n world");
    }
}
```

Kết quả

2.2.2 Write, compile the first dialog Java program

```java
import javax.swing.JOptionPane;

public class FirstDialog {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        JOptionPane.showMessageDialog( parentComponent: null,  message: " Bui Quang Phuong - 20235809 - Hello world! How are you");
        System.exit( status: 0);
    }
}
```


2.2.3 Write, compile the first input dialog Java application

```java
import javax.swing.JOptionPane;

public class HelloNameDialog {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        String result = JOptionPane.showInputDialog("Bui Quang Phuong - 20235809 - Please enter your name");
        JOptionPane.showMessageDialog( parentComponent: null,  message: "Bui Quang Phuong - 20235809 - Hi " + result + " !");
        System.exit( status: 0);
    }
}
```

2.2.4 Write, compile, and run the following example:

```java
import javax.swing.JOptionPane;

public class ShowTwoNumbers {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        String strNotification = "Bui Quang Phuong - 20235809 -
You just entered ";
        String strNum1, strNum2;
        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 first number: ", "Input the second number",
JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum2;
        JOptionPane.showMessageDialog(null, strNotification,
"Bui Quang Phuong - 20235809 - Show two numbers",
JOptionPane.INFORMATION_MESSAGE);
        System.exit(0);
    }
}
```
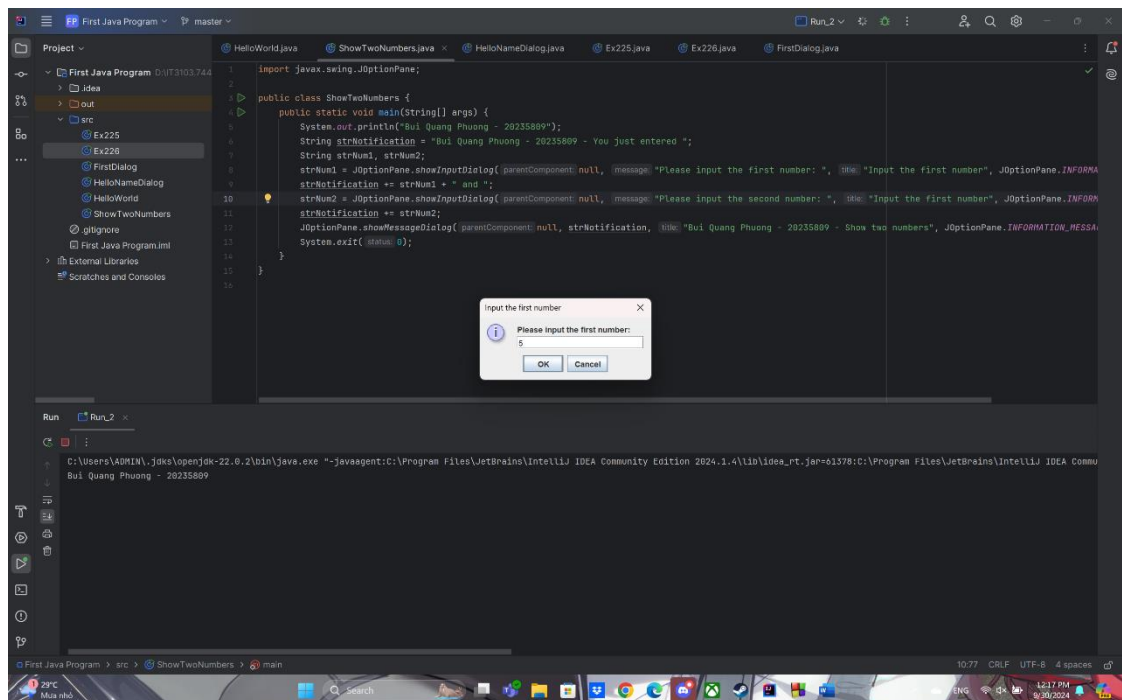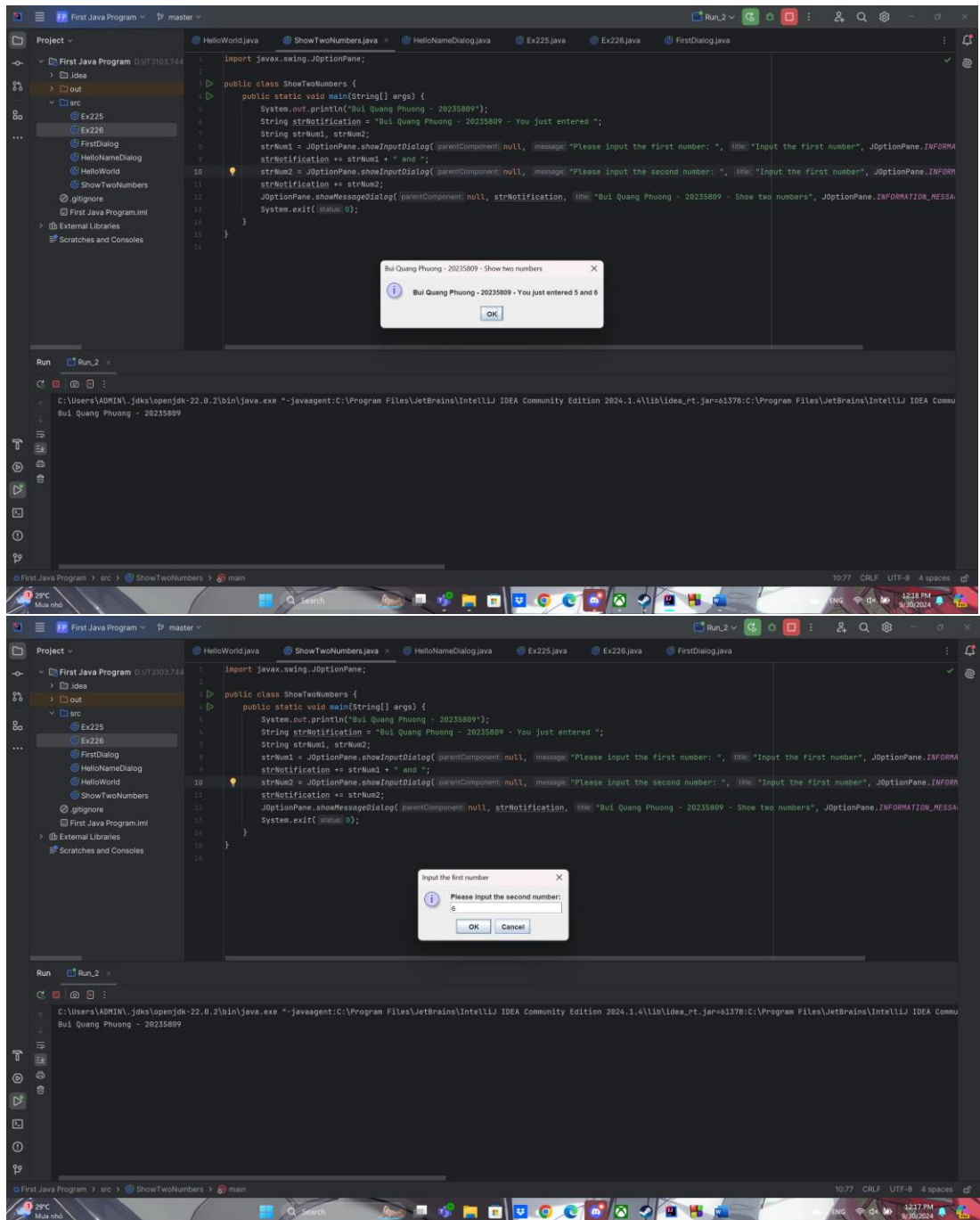
BÀI TẬP

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

```
import javax.swing.JOptionPane;

public class Ex225 {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        String strNum1, strNum2;
        strNum1 = JOptionPane.showInputDialog(null, "Please input the first number: ", "Input the first
number", JOptionPane.INFORMATION_MESSAGE);
        strNum2 = JOptionPane.showInputDialog(null, "Please input the second number: ", "Input the first
number", JOptionPane.INFORMATION_MESSAGE);
        double num1 = Double.parseDouble(strNum1);
        double num2 = Double.parseDouble(strNum2);
        String strNotification = "Bui Quang Phuong - 20235809\n";
        JOptionPane.showMessageDialog(null, strNotification +
                "Sum: " + (num1 + num2) + "\n" +
                "Difference: " + (num1 - num2) + "\n" +
                "Product: " + (num1 * num2) + "\n" +
                "Quotient: " + (num1 / num2) + "\n"
                , "Bui Quang Phuong - 20235809 - Show calc", JOptionPane.INFORMATION_MESSAGE);
        System.exit(0);
    }
}
```
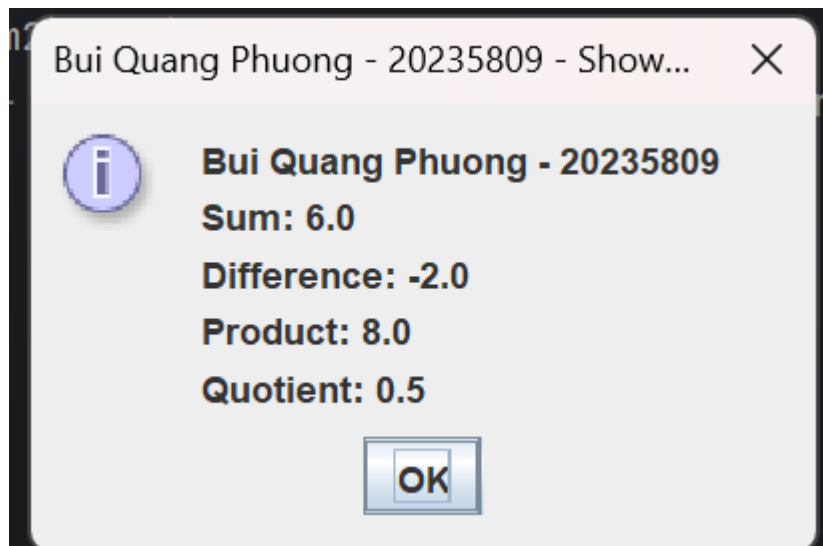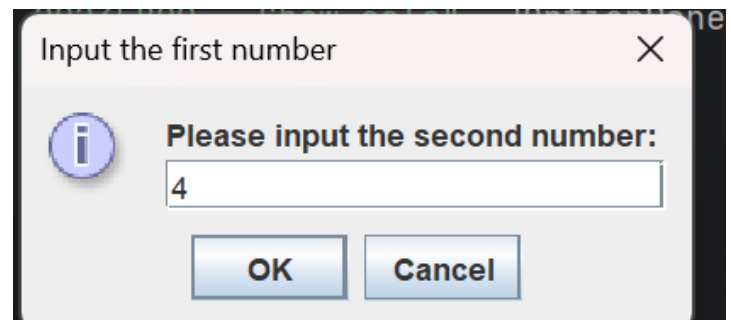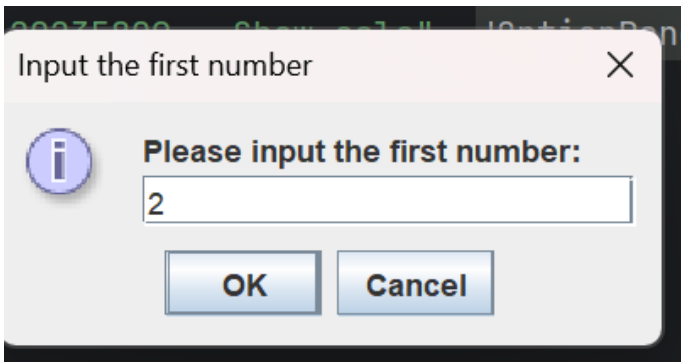
2.2.6. Write a program to solve:

- 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
import java.util.Scanner;
public class Ex226 {
    private static void firstDegreeEquation(double a, double b){
        if(b==0) System.out.println("x = 0");
        else if(a==0 && b==0) System.out.println("Wealth of counter");
        else if(a==0 && b!=0) System.out.println("No solution");
        else System.out.println("x = "+ -b/a);
    }
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        Scanner sc = new Scanner(System.in);
        System.out.println("The first-degree equation (linear equation) with one variable");
        System.out.print("Enter figure of equation : ");
        double a = Double.parseDouble(sc.next());
        double b = Double.parseDouble(sc.next());
        System.out.println("Experiment of "+a+"*x + "+b+" = 0 is:");
        firstDegreeEquation(a,b);
        System.out.println("The system of first-degree equations (linear system) with two
variables");
        System.out.print("Enter figure of equation : ");
        double a11 = Double.parseDouble(sc.next());
        double a12 = Double.parseDouble(sc.next());
        double b1 = Double.parseDouble(sc.next());
        double a21 = Double.parseDouble(sc.next());
        double a22 = Double.parseDouble(sc.next());
        double b2 = Double.parseDouble(sc.next());
        double D = a11*a22 - a12*a21;
        double Dx = b1*a22 - b2*a12;
        double Dy = a11*b2 - a21*b1;
        System.out.println("Experiment of \n"+a11+"*x1 + "+a12+"*x2 = "+b1+"\n"+a21+"*x1 +
"+a22+"*x2 = "+b2+"\nIs:");
        if(D!=0) System.out.println("x1 = "+Dx/D+"; x2 = "+Dy/D);
        else if(D==0 && (Dx ==0 || Dy == 0)) System.out.println("No solution");
        else System.out.println("Wealth of counter");
        System.out.println("The second-degree equation with one variable");
        a = Double.parseDouble(sc.next());
        b = Double.parseDouble(sc.next());
        double c = Double.parseDouble(sc.next());
        double delta = Math.pow(b,2)-4*a*c;
        System.out.println("Experiment of \n"+a+"*x^2 + "+b+"*x + "+c+" = 0 is:");
        if(a==0) firstDegreeEquation(b,c);
        else {
            if(delta < 0) System.out.println("No solution");
            else if(delta == 0) System.out.println("x1 = x2 = "+ -b/2*a);
            else System.out.println("x1 = "+(-b+Math.sqrt(delta))/2*a+"\n x2 = "+(-b-
Math.sqrt(delta))/2*a);
        }
    }
}
```
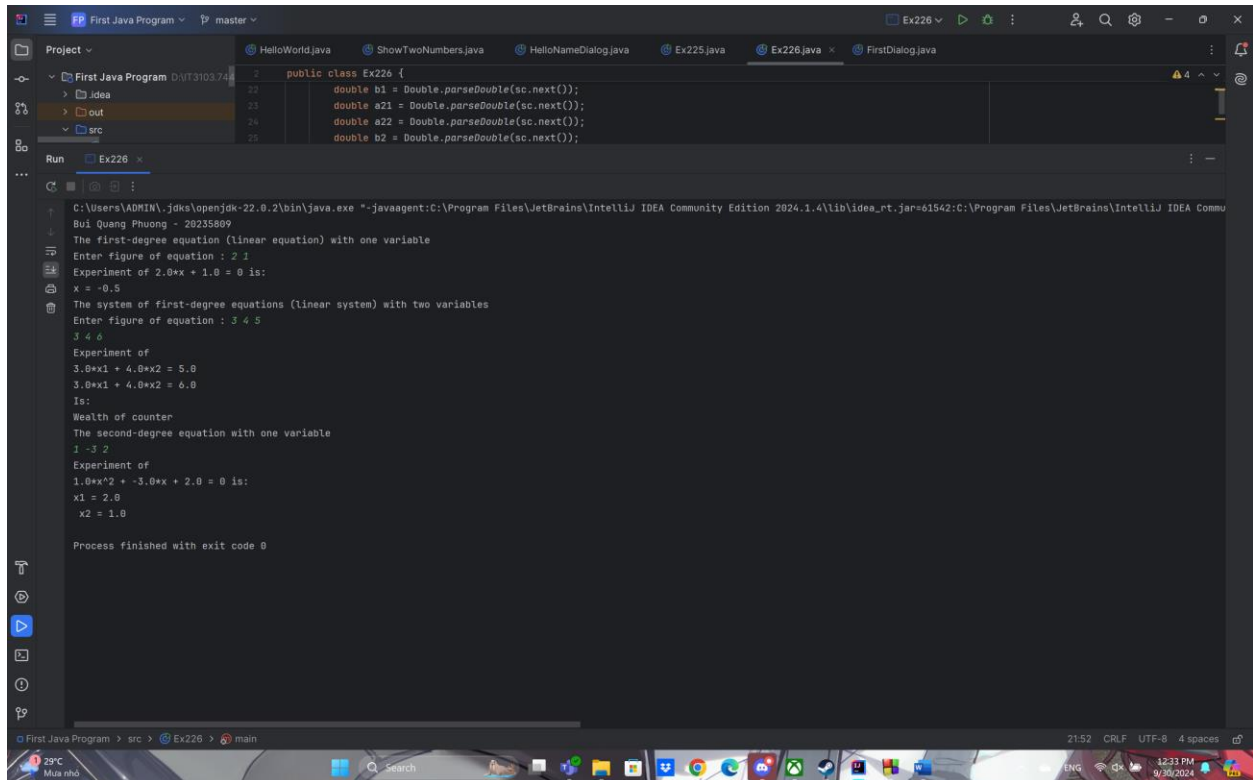
6.1 Write, compile and run the ChoosingOption program:

```java
import javax.swing.JOptionPane;
public class ChoosingOption {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        int option = JOptionPane.showConfirmDialog( parentComponent: null, message: "Do you want to change to first class ticket?");
        JOptionPane.showMessageDialog( parentComponent: null, message: "You have chosen: " + (option == JOptionPane.YES_OPTION?"YES":"NO"));
        System.exit( status: 0);
    }
}
```
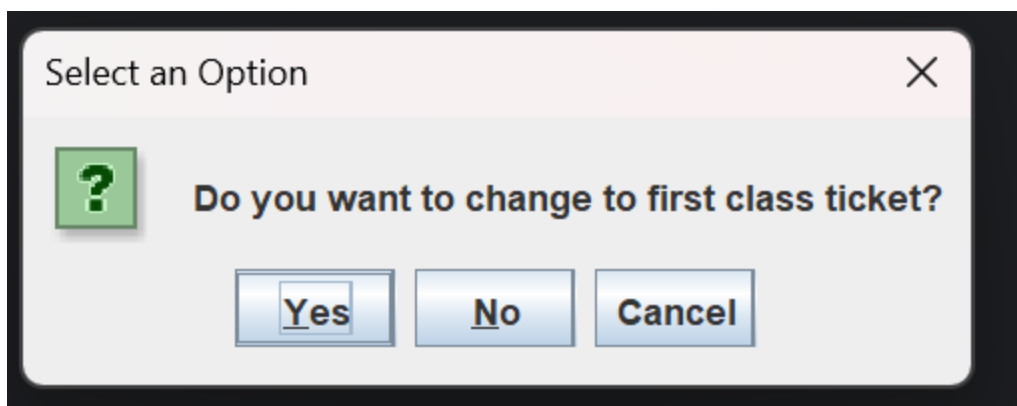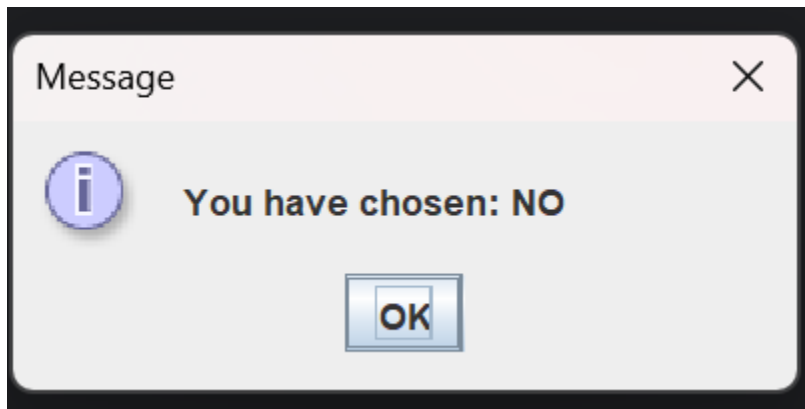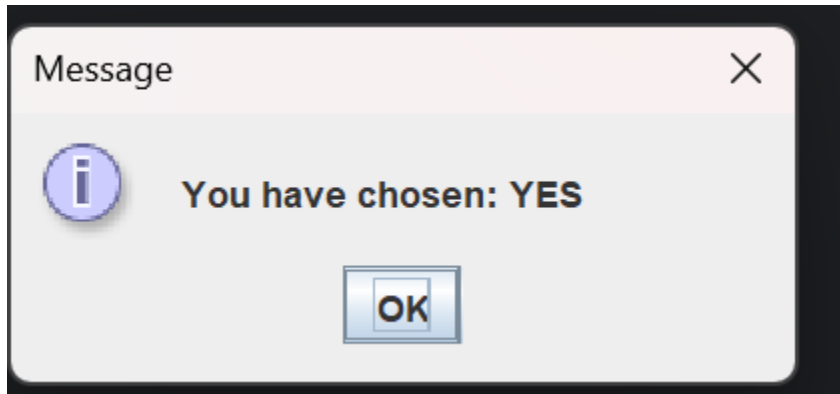
6.2 Write a program for input/output from keyboard

```java
import java.util.Scanner;
public class InputFromKeyboard {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        Scanner sc = new Scanner(System.in);
        System.out.println("What 's your name ?");
        String strName = sc.nextLine();
        System.out.println("How old are you ?");
        int iAge = sc.nextInt();
        System.out.println("How tall are you (m) ?");
        double dHeight = sc.nextDouble();

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

```
Run    InputFromKeyboard  ×

C:\Users\ADMIN\.jdks\openjdk-22.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community
Bui Quang Phuong - 20235809
What 's your name ?
Bui Quang Phuong
How old are you ?
19
How tall are you (m) ?
1.75
Mrs/Ms. Bui Quang Phuong, 19 years old. Your height is 1.75.

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
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        System.out.println("Please enter the heigh: ");
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        for (int i = 1; i <=n; ++i) {
            for (int j = 1; j <= 2*n-1; ++j) {
                if (j >= n-i+1 && j <= n+i-1) {
                    System.out.print("*");
                } else System.out.print(" ");
            }
            System.out.println("");
        }
    }
}
```

```
Run    Main ×

Please enter the heigh:
6
     *
    ***
   *****
  *******
 *********
***********

Process finished with exit code 0
```

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
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        System.out.print("Please enter month and year: ");
        Scanner sc = new Scanner(System.in);
        String month = sc.next();
        int year = sc.nextInt();
        month = month.toLowerCase();
        if (year > 0) {
            if (month.equals("january") || month.equals("march")||
month.equals("may")|| month.equals("july") || month.equals("august")||
month.equals("october") || month.equals("december")) {
                System.out.println(31);
                System.exit(0);
            }
            if (month.equals("jan") || month.equals("mar")|| month.equals("jul") ||
month.equals("aug")|| month.equals("oct") || month.equals("dec")) {
                System.out.println(31);
                System.exit(0);
            }
            if (month.equals("jan.") || month.equals("mar.")|| month.equals("jul.")
|| month.equals("aug.")|| month.equals("oct.") || month.equals("dec.")) {
                System.out.println(31);
                System.exit(0);
            }
            if (month.equals("1") || month.equals("3")|| month.equals("7") ||
month.equals("8")|| month.equals("10") || month.equals("12")) {
                System.out.println(31);
                System.exit(0);
            }
            if (month.equals("april") || month.equals("june")||
month.equals("september") || month.equals("november")) {
                System.out.println(30);
                System.exit(0);
            }
            if (month.equals("apr") || month.equals("jun")|| month.equals("sep") ||
month.equals("nov")) {
                System.out.println(30);
                System.exit(0);
            }
            if (month.equals("apr.") || month.equals("jun.")|| month.equals("sep.")
|| month.equals("nov.")) {
                System.out.println(30);
                System.exit(0);
            }
        }
        if (month.equals("february") || month.equals("feb")|| month.equals("feb.")
|| month.equals("2")) {
            if (year > 0) {
                if (year % 400 == 0 || (year % 4 == 0 && year % 100 != 0)) {
                    System.out.println(29);
                    System.exit(0);
                } else {
                    System.out.println(28);
```

```
                System.exit(0);
            }
        }
    }
    System.out.println("Month or year is invalid");
    main(new String[] {"Re-enter"});
    }
}
```

```
C:\Users\ADMIN\.jdks\openjdk-22.0.2\bin\java.exe
Bui Quang Phuong - 20235809
Please enter month and year: 2 2100
28


Process finished with exit code 0
```

```
C:\Users\ADMIN\.jdks\openjdk-22.0.2\bin\java.exe "-javaagent:C:\P
Bui Quang Phuong - 20235809
Please enter month and year: Jap 2021
Month or year is invalid
Bui Quang Phuong - 20235809
Please enter month and year: Jan -2021
Month or year is invalid
Bui Quang Phuong - 20235809
Please enter month and year: Jan 2021
31


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
import java.util.Scanner;
import java.util.Arrays;
public class Main {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        System.out.print("Please enter the size of array: ");
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        int[] arr = new int[n];
        int sum = 0;
        System.out.print("Please enter element of array: ");
        for(int i = 0; i <= n-1; ++i) {
            arr[i] = sc.nextInt();
            sum += arr[i];
        }
        Arrays.sort(arr);
        System.out.println("Sorted array: " + Arrays.toString(arr));
        System.out.println("Sum value: "+sum);
        System.out.println("Average value: " + (double)sum/n);
    }
}
```

```
C:\Users\ADMIN\.jdks\openjdk-22.0.2\bin\java.exe "-javaagent:C:\Program Files\
Bui Quang Phuong - 20235809
Please enter the size of array: 6
Please enter element of array: 3 1 5 8 6 2
Sorted array: [1, 2, 3, 5, 6, 8]
Sum value: 25
Average value: 4.166666666666667

Process finished with exit code 0
```

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

```java
import java.util.Scanner;
import java.util.Arrays;
public class Main {
    public static void main(String[] args) {
        System.out.println("Bui Quang Phuong - 20235809");
        System.out.print("Please enter the size of matrices (n x m): ");
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        int m = sc.nextInt();
        int[][] matrix_1 =  new int[n][m];
        int[][] matrix_2 =  new int[n][m];
        int[][] matrix_sum =  new int[n][m];
        int sum = 0;

        System.out.println("Please enter element of matrix 1: ");
        for(int i = 0; i <= n-1; ++i) {
            for (int j = 0; j <= m-1; ++j) {
                matrix_1[i][j] = sc.nextInt();
            }
        }

        System.out.println("Please enter element of matrix 2: ");
        for(int i = 0; i <= n-1; ++i) {
            for (int j = 0; j <= m-1; ++j) {
                matrix_2[i][j] = sc.nextInt();
                matrix_sum[i][j] = matrix_1[i][j] + matrix_2[i][j];
            }
        }

        System.out.println("The sum of two matrices is: ");
        for(int i = 0; i <= n-1; ++i) {
            for (int j = 0; j <= m-1; ++j) {
                System.out.print(matrix_sum[i][j] + " ");
            }
            System.out.print("\n");
        }

    }
}
```

```
C:\Users\ADMIN\.jdks\openjdk-22.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\Intel
Bui Quang Phuong - 20235809
Please enter the size of matrices (n x m): 3 4
Please enter element of matrix 1:
5 4 1 3
-2 2 4 6
8 -1 7 3
Please enter element of matrix 2:
1 -2 4 9
26 17 -7 4
12 3 -6 4
The sum of two matrices is:
6 2 5 12
24 19 -3 10
20 2 1 7

Process finished with exit code 0
```