

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

**BÁO CÁO THỰC HÀNH**  
**IT3103-744528-2024.1**  
**BÀI THỰC HÀNH -LAB01**

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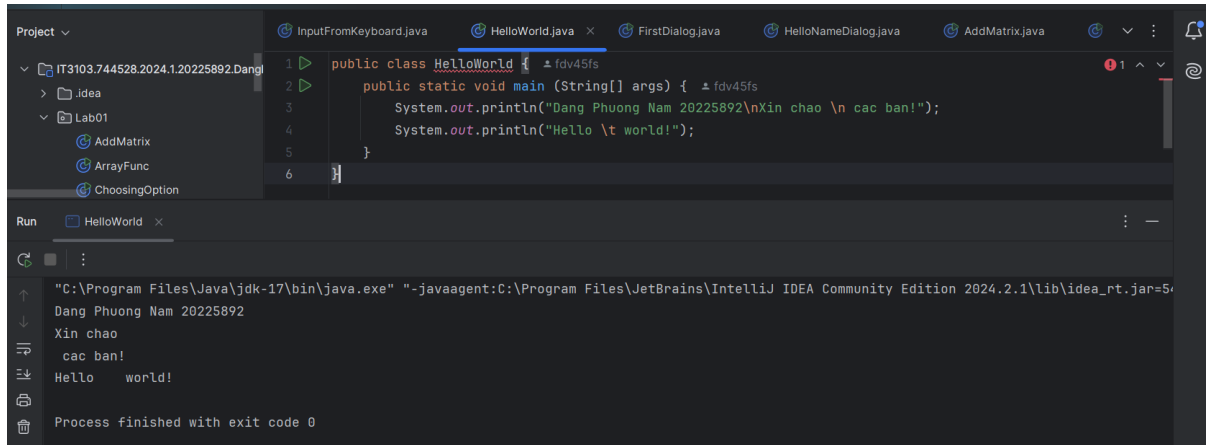
**HTGD: Đặng Mạnh Cường**

**Hà Nội 9/2024**

# Báo cáo thực hành Lab 1

## I. The Very First Java Programs

### 1. Write, compile the first Java application



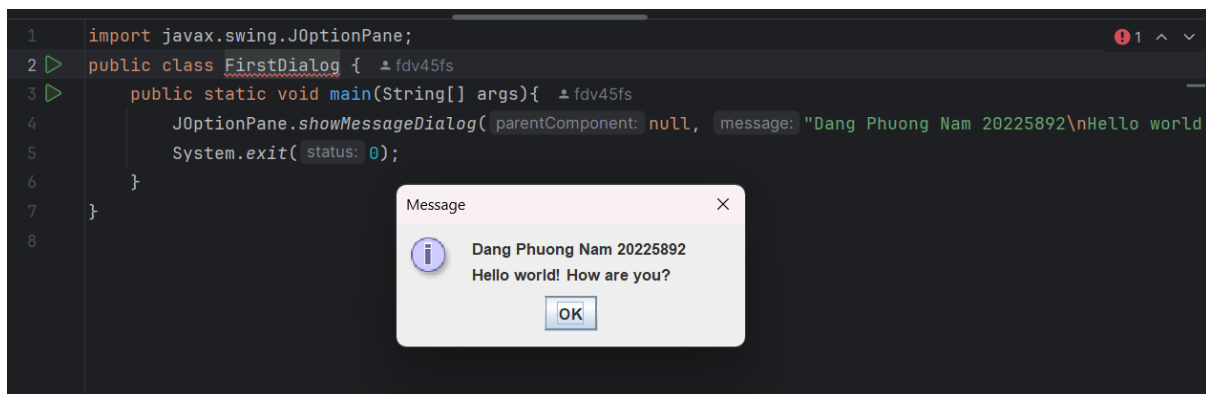
The screenshot shows the IntelliJ IDEA IDE with the `HelloWorld.java` file open. The code is as follows:

```
1 public class HelloWorld {
2     public static void main (String[] args) {
3         System.out.println("Dang Phuong Nam 20225892\nXin chao \n cac ban!");
4         System.out.println("Hello \t world!");
5     }
6 }
```

The Run window at the bottom shows the output of the program:

```
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=5..."
Dang Phuong Nam 20225892
Xin chao
cac ban!
Hello world!
Process finished with exit code 0
```

### 2. Write, compile the first dialog Java program



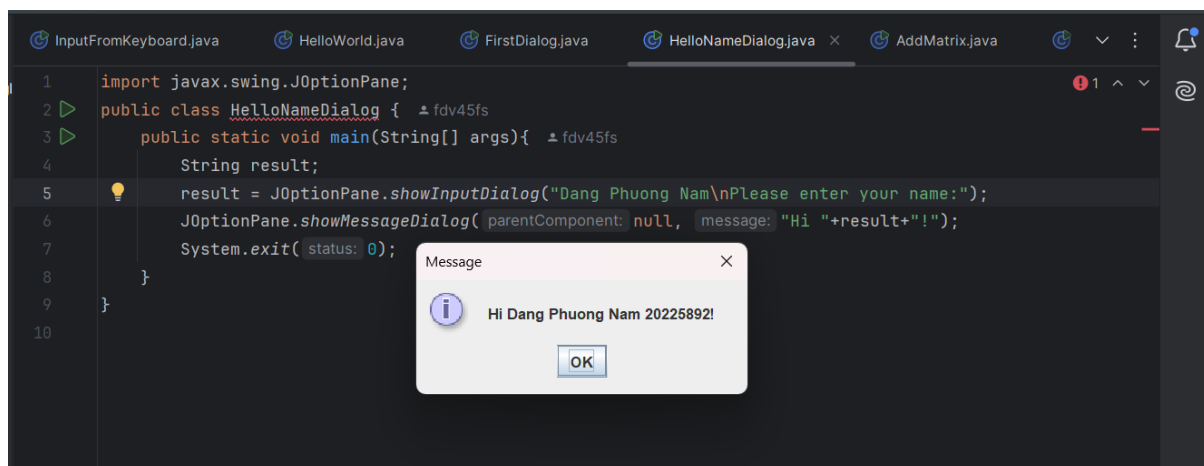
The screenshot shows the IntelliJ IDEA IDE with the `FirstDialog.java` file open. The code is as follows:

```
1 import javax.swing.JOptionPane;
2 public class FirstDialog {
3     public static void main(String[] args){
4         JOptionPane.showMessageDialog( parentComponent: null, message: "Dang Phuong Nam 20225892\nHello world
5         System.exit( status: 0);
6     }
7 }
8 }
```

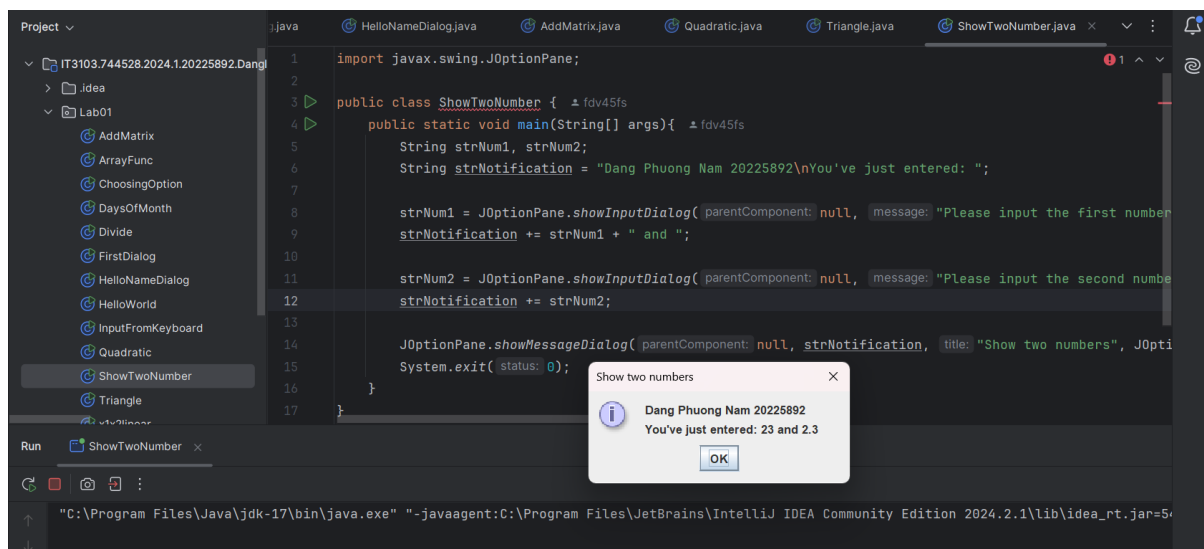
A message dialog box is displayed with the following text:

```
Message
Dang Phuong Nam 20225892
Hello world! How are you?
OK
```

### 3. Write, compile the first input dialog Java application



### 4. Write, compile, and run the following example



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

```

3 public class SumDiffQuotient {
4     public static void main(String[] args) {
9         double num2 = Double.parseDouble(strNum2);
10
11         double sum = num1 + num2;
12         double difference = num1 - num2;
13         double product = num1*num2;
14
15         String text = "Dang Phuong Nam 20225892\nSum: "+sum +"\n"+ "Difference: " + difference + "\n" + "Product: " + product + "\n";
16
17         if (num2 != 0) {
18             double quotient = num1/num2;
19             text += "Quotient: " + quotient;
20         } else {
21             text += "Cannot divide by zero";
22         }
23         JOptionPane.showMessageDialog( parentComponent: null, text);
24     }
25 }
26

```

Message Dialog Box Content:

```

Dang Phuong Nam 20225892
Sum: 4.800000000000001
Difference: 1.6
Product: 5.120000000000001
Quotient: 2.0

```

## 6. Write a program to solve

- The first-degree equation (linear equation) with one variable
  - With  $a = 3$ ,  $b = 2$

```

1 import javax.swing.JOptionPane;
2
3 public class y_ax_b {
4     public static void main(String[] args) {
5         String strA = JOptionPane.showInputDialog("Enter coefficient a:");
6         String strB = JOptionPane.showInputDialog("Enter constant b:");
7
8         double a = Double.parseDouble(strA);
9         double b = Double.parseDouble(strB);
10
11         if (a == 0) {
12             if (b == 0) JOptionPane.showMessageDialog( parentComponent: null, message: "Dang Phuong Nam 20225892\nInfinite solutions");
13             else JOptionPane.showMessageDialog( parentComponent: null, message: "Dang Phuong Nam 20225892\nNo solution");
14         } else {
15             double x = -b / a;
16             JOptionPane.showMessageDialog( parentComponent: null, message: "Dang Phuong Nam 20225892\nx = " + x);
17         }
18     }
19 }
20

```

Message Dialog Box Content:

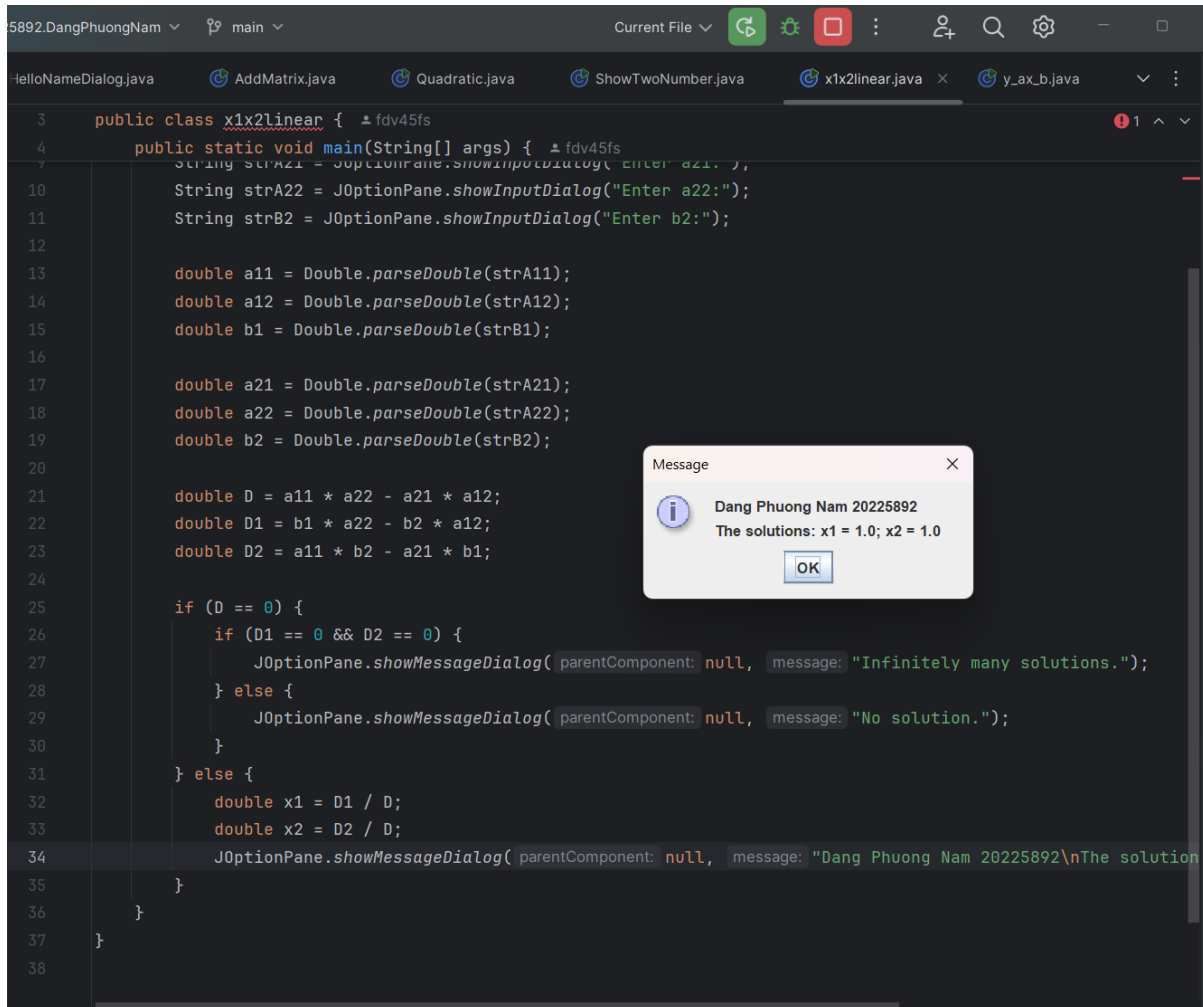
```

Dang Phuong Nam 20225892
x = -0.6666666666666666

```

b. The system of first-degree equations (linear system) with two variables

- Với hệ số lần lượt là 1 2 3; 1 -1 0



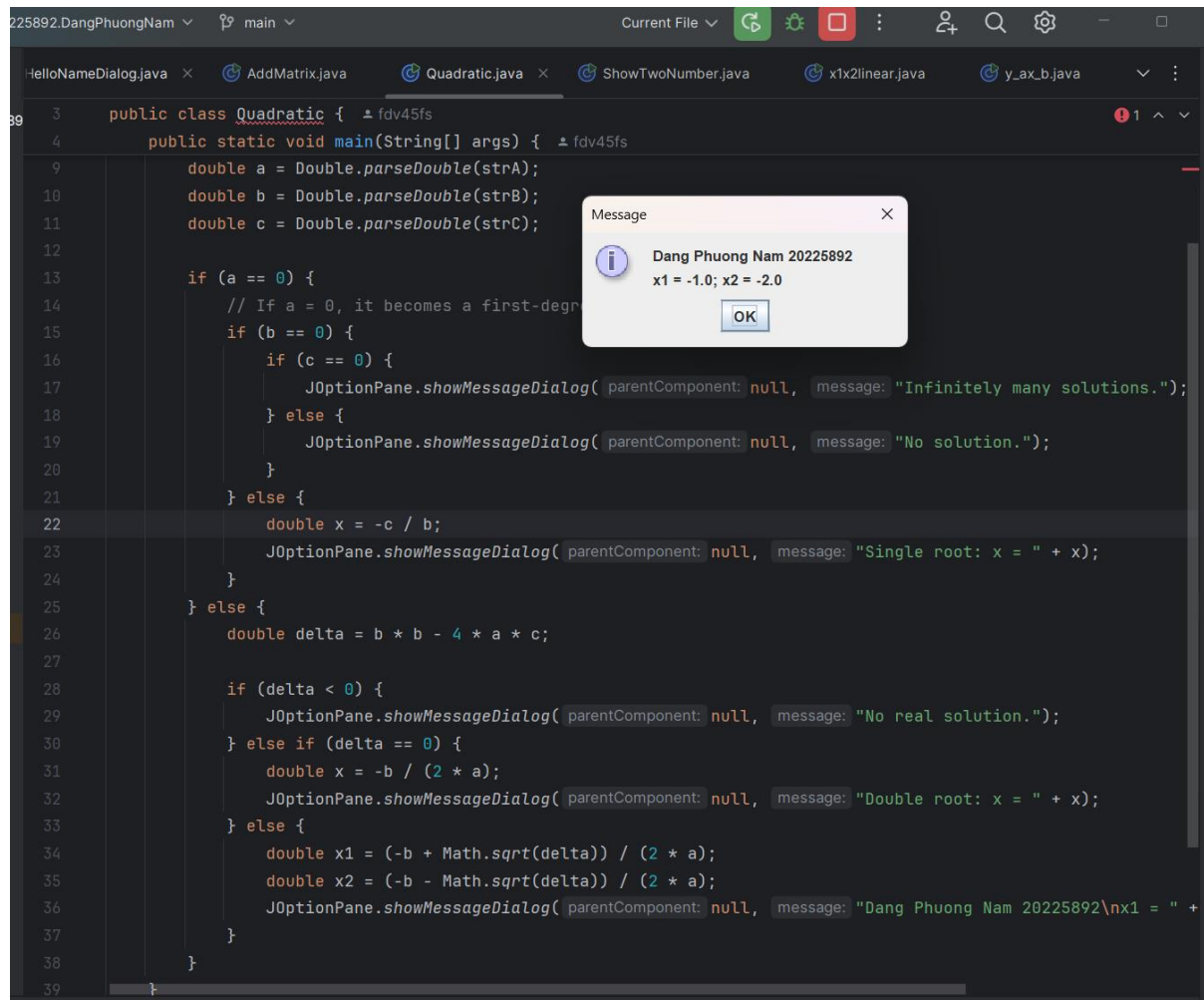
```
3 public class x1x2linear {
4     public static void main(String[] args) {
5         String strA1 = JOptionPane.showInputDialog("Enter a1:");
10        String strA2 = JOptionPane.showInputDialog("Enter a2:");
11        String strB2 = JOptionPane.showInputDialog("Enter b2:");
12
13        double a11 = Double.parseDouble(strA1);
14        double a12 = Double.parseDouble(strA2);
15        double b1 = Double.parseDouble(strB1);
16
17        double a21 = Double.parseDouble(strA21);
18        double a22 = Double.parseDouble(strA22);
19        double b2 = Double.parseDouble(strB2);
20
21        double D = a11 * a22 - a21 * a12;
22        double D1 = b1 * a22 - b2 * a12;
23        double D2 = a11 * b2 - a21 * b1;
24
25        if (D == 0) {
26            if (D1 == 0 && D2 == 0) {
27                JOptionPane.showMessageDialog( parentComponent: null, message: "Infinitely many solutions.");
28            } else {
29                JOptionPane.showMessageDialog( parentComponent: null, message: "No solution.");
30            }
31        } else {
32            double x1 = D1 / D;
33            double x2 = D2 / D;
34            JOptionPane.showMessageDialog( parentComponent: null, message: "Dang Phuong Nam 20225892\nThe solution
35        }
36    }
37 }
38 }
```

Message

Dang Phuong Nam 20225892  
The solutions: x1 = 1.0; x2 = 1.0

OK

- c. The second-degree equation with one variable
- Với hệ số là 1 3 2



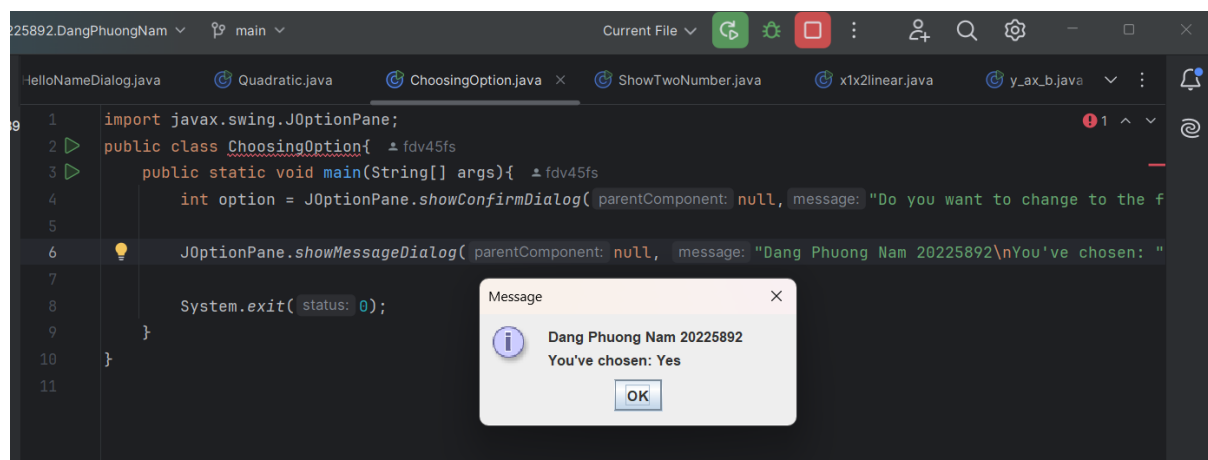
The screenshot shows a Java IDE with the file `Quadratic.java` open. The code implements a quadratic equation solver. A message dialog box is displayed over the code, showing the message: "Dang Phuong Nam 20225892 x1 = -1.0; x2 = -2.0". The code in the background is as follows:

```

3 public class Quadratic {
4     public static void main(String[] args) {
5         double a = Double.parseDouble(strA);
6         double b = Double.parseDouble(strB);
7         double c = Double.parseDouble(strC);
8
9         if (a == 0) {
10             // If a = 0, it becomes a first-degree
11             if (b == 0) {
12                 if (c == 0) {
13                     JOptionPane.showMessageDialog(
14                         parentComponent: null, message: "Infinitely many solutions.");
15                 } else {
16                     JOptionPane.showMessageDialog(
17                         parentComponent: null, message: "No solution.");
18                 }
19             } else {
20                 double x = -c / b;
21                 JOptionPane.showMessageDialog(
22                     parentComponent: null, message: "Single root: x = " + x);
23             }
24         } else {
25             double delta = b * b - 4 * a * c;
26
27             if (delta < 0) {
28                 JOptionPane.showMessageDialog(
29                     parentComponent: null, message: "No real solution.");
30             } else if (delta == 0) {
31                 double x = -b / (2 * a);
32                 JOptionPane.showMessageDialog(
33                     parentComponent: null, message: "Double root: x = " + x);
34             } else {
35                 double x1 = (-b + Math.sqrt(delta)) / (2 * a);
36                 double x2 = (-b - Math.sqrt(delta)) / (2 * a);
37                 JOptionPane.showMessageDialog(
38                     parentComponent: null, message: "Dang Phuong Nam 20225892\nx1 = " +
39             }
40         }
41     }
42 }

```

## 7. ChoosingOption



The screenshot shows a Java IDE with the file `ChoosingOption.java` open. The code implements a simple choice dialog. A message dialog box is displayed over the code, showing the message: "Dang Phuong Nam 20225892 You've chosen: Yes". The code in the background is as follows:

```

1 import javax.swing.JOptionPane;
2 public class ChoosingOption {
3     public static void main(String[] args) {
4         int option = JOptionPane.showConfirmDialog(
5             parentComponent: null, message: "Do you want to change to the f
6         JOptionPane.showMessageDialog(
7             parentComponent: null, message: "Dang Phuong Nam 20225892\nYou've chosen: "
8         System.exit(0);
9     }
10 }

```

- Với lựa chọn Cancel, chương trình hiển thị “No” vì phép so sánh với giá trị Yes trả về giá trị false
- Ta có thể truyền vào một mảng gồm các chuỗi sẽ được hiển thị ở nút để có thể hiển thị 2 giá trị tùy chỉnh

```
String[] options = {"I do", "I don't"};

int choice = JOptionPane.showOptionDialog( parentComponent: null,
    message: "Do you agree?",
    title: "Question",
    JOptionPane.DEFAULT_OPTION,
    JOptionPane.PLAIN_MESSAGE,
    icon: null, options, options[0]);
```

## 8. Write a program for input/output from keyboard

The screenshot displays an IDE with a project named "IT3103.744528.2024.1.2022589". The project structure includes a "Lab01" folder with several Java files. The active file is "InputFromKeyboard.java", which contains the following code:

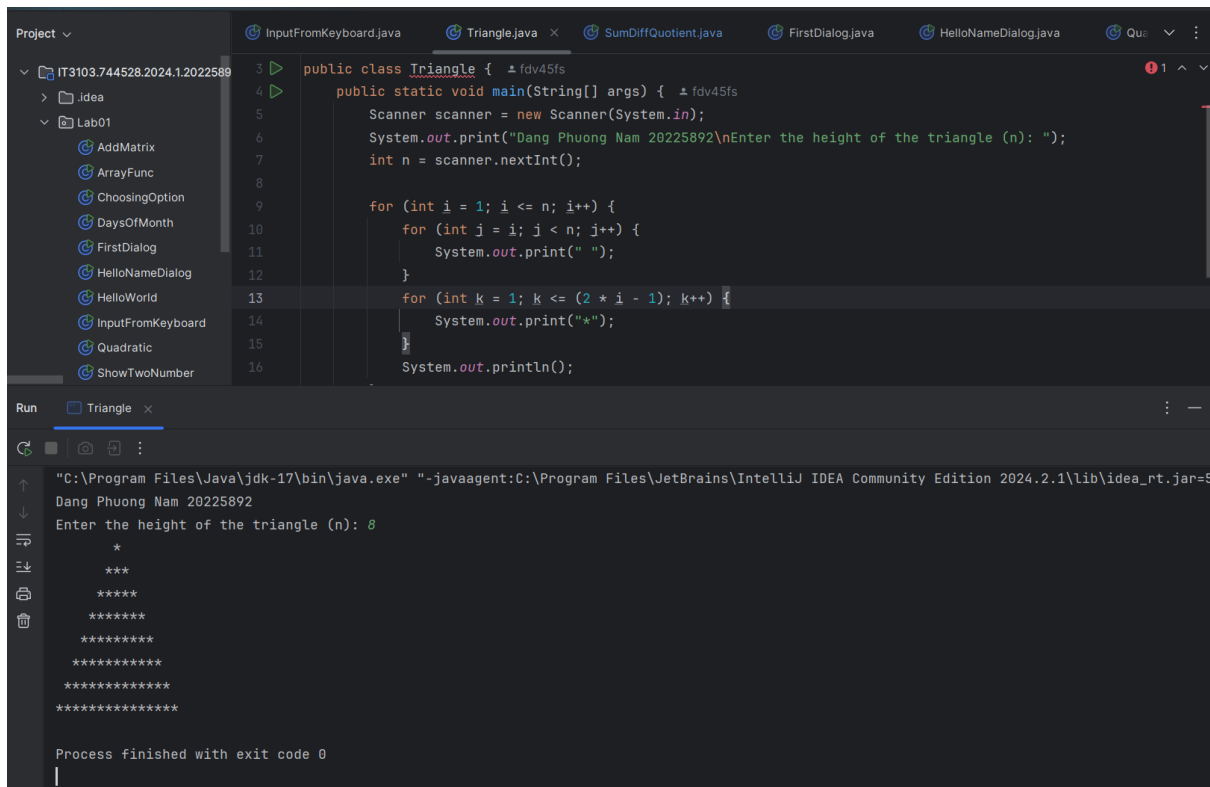
```
2 public class InputFromKeyboard{
3     public static void main(String args[]){
4
5
6         System.out.println("What's your name?");
7         String strName = keyboard.nextLine();
8         System.out.println("How old are you?");
9         int iAge = keyboard.nextInt();
10        System.out.println("How tall are you (m)?");
11        double dHeight = keyboard.nextDouble();
12
13        System.out.println("Mr. " + strName + ", " + iAge + " years old. " + "Your height is " + dHeight + "m.");
14    }
```

The "Run" window shows the execution of the program. The output is as follows:

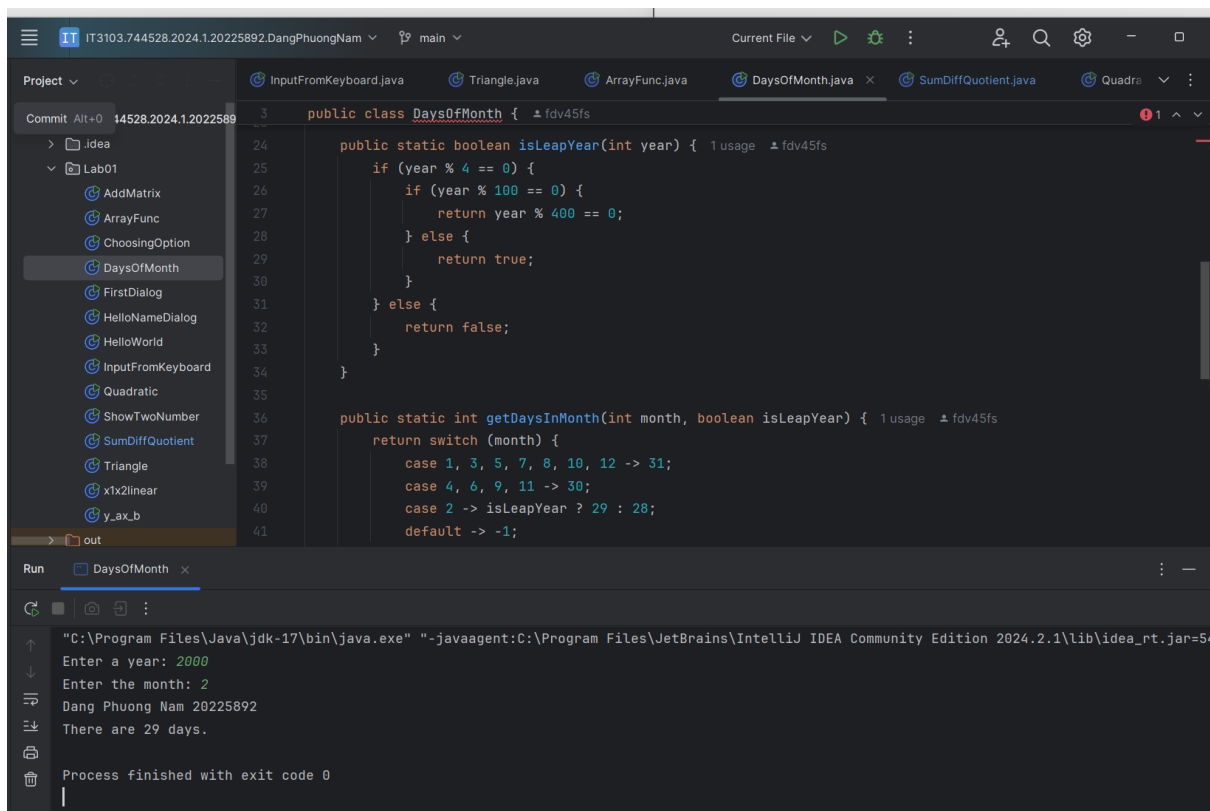
```
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=5..."
What's your name?
Dang Phuong Nam 20225892
How old are you?
20
How tall are you (m)?
1.7
Mr. Dang Phuong Nam 20225892, 20 years old. Your height is 1.7m.

Process finished with exit code 0
```

### 9. Triangle of stars with a height of n lines



## 10. Days of a month





## 11. Array related operations

The screenshot shows the IntelliJ IDEA interface with the `ArrayFunc.java` file open. The code defines a `main` method that takes an array of doubles, prints the sorted array, calculates the sum, and calculates the average. The `Run` tab shows the execution output, which includes the input size (4), the input elements (2.2, -3.5453, 1.0), the sorted array, the sum, and the average.

```

public class ArrayFunc {
    public static void main(String[] args) {
        System.out.print("Dang Phuong Nam 20225892\nSorted Array: ");
        for (int i = 0; i < size; i++) {
            System.out.print(array[i] + " ");
        }
        System.out.println();

        double sum = 0;
        for (double num : array) {
            sum += num;
        }

        System.out.println("Sum of Array Elements: " + sum);

        double average = sum / size;
        System.out.println("Average of Array Elements: " + average);
    }
}

```

Run Output:

```

"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=5...
Enter the size of the array: 4
Enter the elements:
2.2 -3.5453 1 0
Dang Phuong Nam 20225892
Sorted Array: -3.5453 0.0 1.0 2.2
Sum of Array Elements: -0.34529999999999994
Average of Array Elements: -0.08632499999999999
Process finished with exit code 0

```

## 12. Add two matrices

The screenshot shows the IntelliJ IDEA interface with the `AddMatrix.java` file open. The code defines a `main` method that takes two matrices, calculates their sum, and prints the result. The `Run` tab shows the execution output, which includes the input rows (2) and columns (3), the input elements for both matrices, the sum of the two matrices, and the final result.

```

public class AddMatrix {
    public static void main(String[] args) {
        matrix1[i][j] = scanner.nextInt();
    }

    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < columns; j++) {
            sumMatrix[i][j] = matrix1[i][j] + matrix2[i][j];
        }
    }

    System.out.println("Dang Phuong Nam 20225892\nSum of the two matrices is:");
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < columns; j++) {
            System.out.print(sumMatrix[i][j] + " ");
        }
        System.out.println();
    }
}

```

Run Output:

```

"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=5...
Enter the number of rows: 2
Enter the number of columns: 3
Enter elements of the first matrix:
1 3 2 0 3 4
Enter elements of the second matrix:
5 0 0 2 1 2
Dang Phuong Nam 20225892
Sum of the two matrices is:
6 3 2
2 4 6
Process finished with exit code 0

```