

BÁO CÁO THỰC HÀNH LAP 1 LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

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The Very First Java Programs

2.2.1. Write, compile the first Java application:

```

1 package Lab_01;
2
3 //Example 1: HelloWorld.java
4 //Text-printing program
5 new *
6 public class HelloWorld{
7     new *
8     public static void main (String args[]){
9         System.out.println("Phuong Tuan Dat - 20215268");
10        System.out.println("Xin chao \n cac ban!");
11        System.out.println("Hello \t world!");
12    } //end of method main
13 }
14

```

Figure 1: 2.2.1a

Kết quả

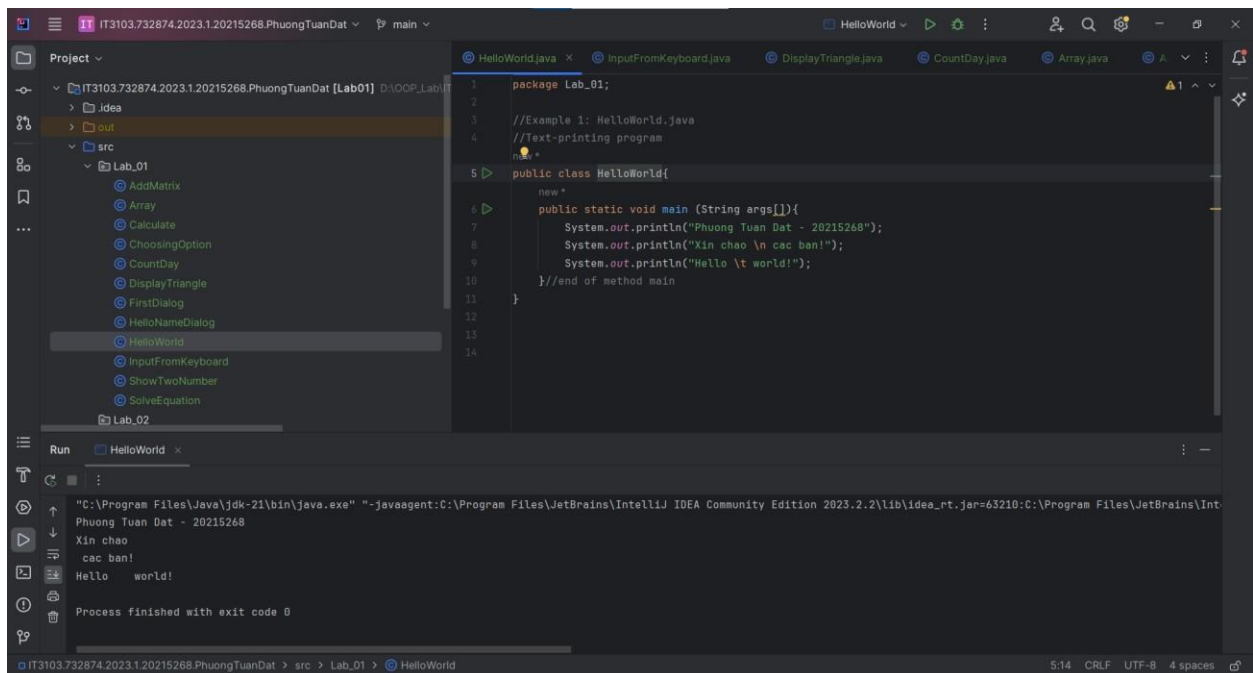


Figure 2: 2.2.1b

2.2.2 Write, compile the first dialog Java program

```
1 package Lab_01;
2 //Example 2: FirstDialog.java
3 import javax.swing.JOptionPane;
4 new *
5 public class FirstDialog {
6 new *
7     public static void main(String[] args){
8         JOptionPane.showMessageDialog( parentComponent: null, message: "Phuong Tuan Dat -20215268 - Hello world!"
9         System.exit( status: 0);
10     }
11 }
```

Figure 3: 2.2.2a

```
1 package Lab_01;
2 //Example 2: FirstDialog.java
3 import javax.swing.JOptionPane;
4 new *
5 public class FirstDialog {
6 new *
7     public static void main(String[] args){
8         JOptionPane.showMessageDialog( parentComponent: null, message: "Phuong Tuan Dat -20215268 - Hello world!"
9         System.exit( status: 0);
10     }
11 }
```

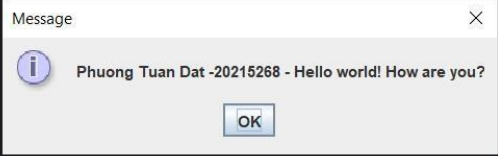


Figure 4: 2.2.2b

2.2.3 Write, compile the first input dialog Java application

```
1 package Lab_01;
2 //Example 3:HelloNameDialog.java
3 import javax.swing.JOptionPane;
4 new *
5 public class HelloNameDialog {
6     new *
7     public static void main(String[] args){
8         String result;
9         result = JOptionPane.showInputDialog("Please enter your name:");
10        JOptionPane.showMessageDialog( parentComponent: null, message: "Hi " + result + "!");
11        System.exit( status: 0);
12    }
13 }
```

Figure 5: 2.2.3a

```
1 package Lab_01;
2 //Example 3:HelloNameDialog.java
3 import javax.swing.JOptionPane;
4 new *
5 public class HelloNameDialog {
6     new *
7     public static void main(String[] args){
8         String result;
9         result = JOptionPane.showInputDialog("Please enter your name:");
10        JOptionPane.showMessageDialog( parentComponent: null, message: "Hi " + result + "!");
11        System.exit( status: 0);
12    }
13 }
```




Figure 6: 2.2.3b

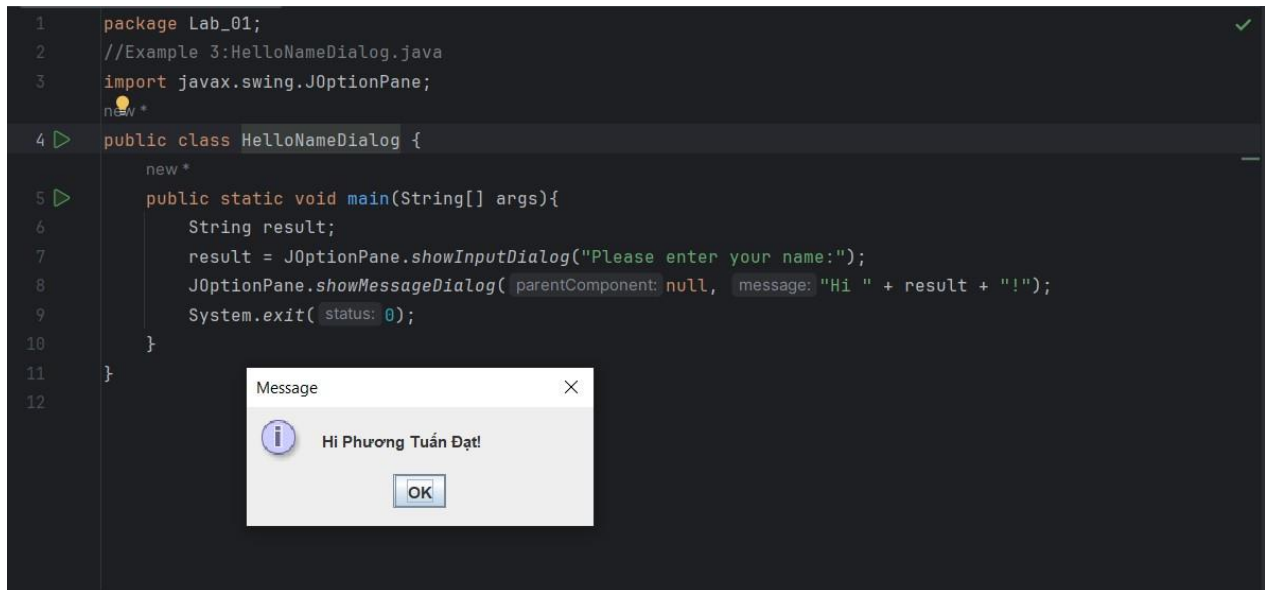


Figure 7: 2.2.3c

2.2.4 Write, compile, and run the following example:

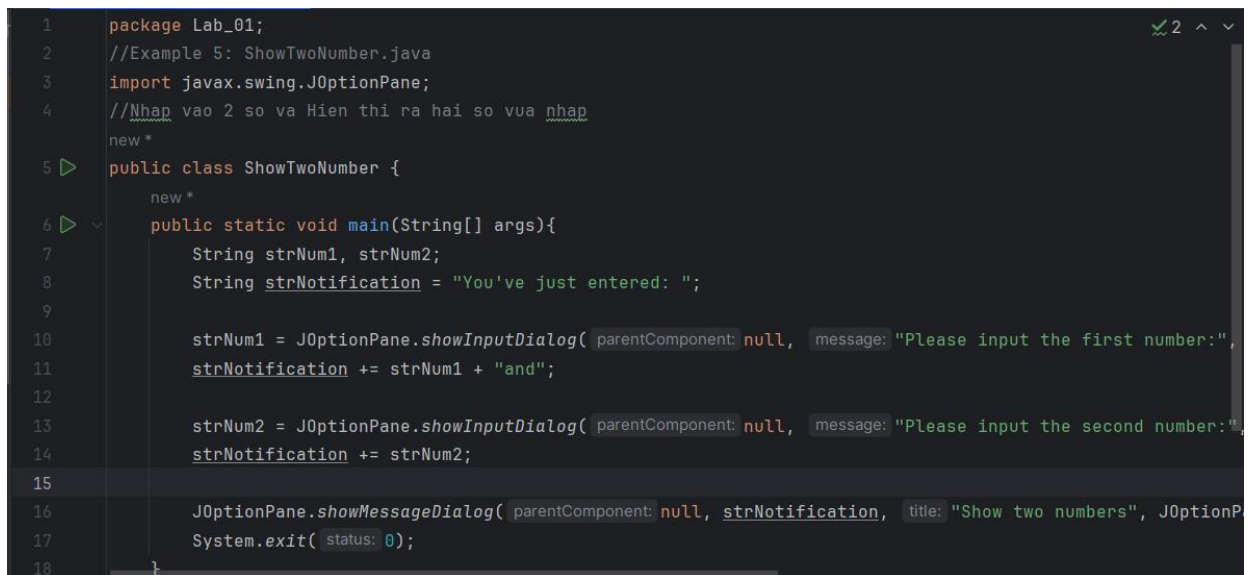


Figure 8: 2.2.4a

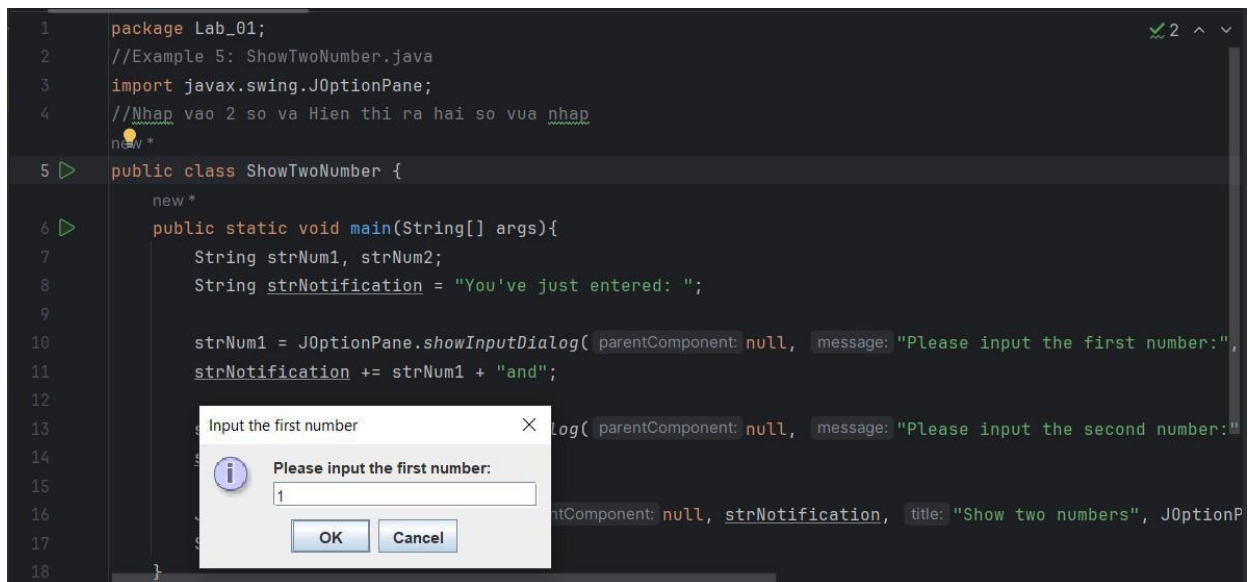


Figure 9: 2.2.4b

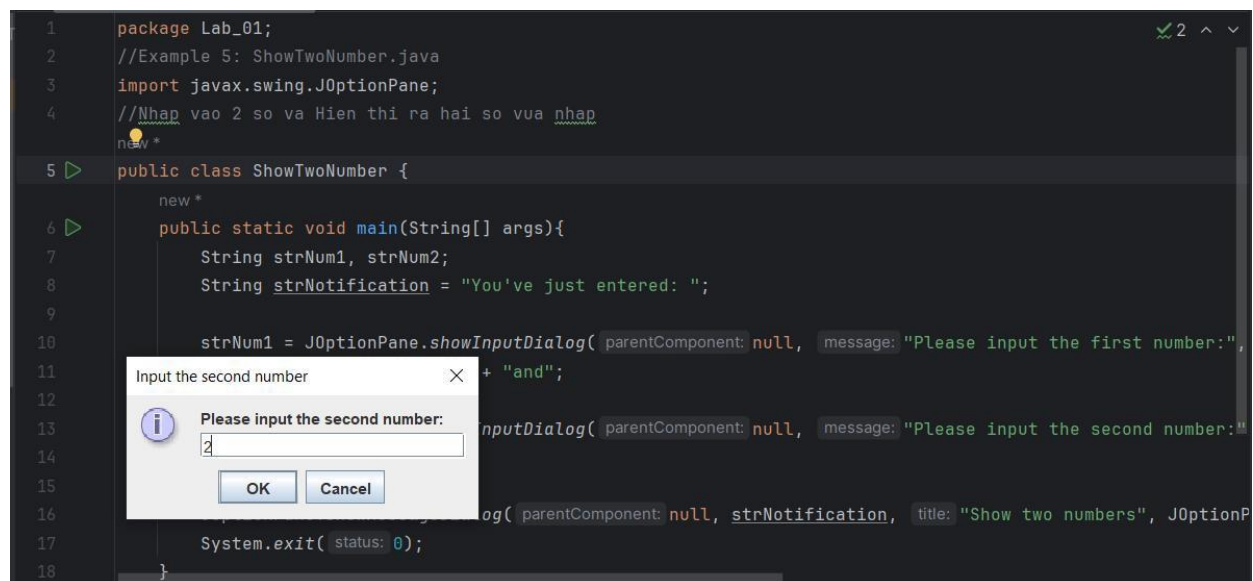
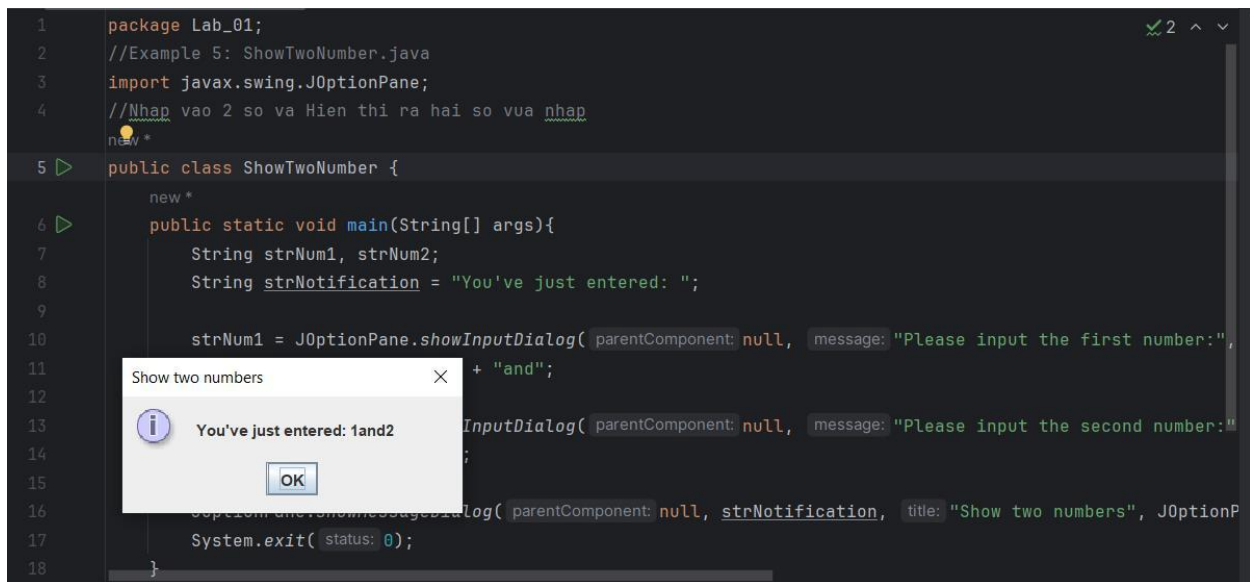


Figure 10: 2.2.4c



```

1  package Lab_01;
2  //Example 5: ShowTwoNumber.java
3  import javax.swing.JOptionPane;
4  //Nhập vào 2 số và Hiển thị ra hai số vừa nhập
5  new *
6  public class ShowTwoNumber {
7      new *
8      public static void main(String[] args){
9          String strNum1, strNum2;
10         String strNotification = "You've just entered: ";
11
12         strNum1 = JOptionPane.showInputDialog( parentComponent: null, message: "Please input the first number:",
13         + "and";
14         JOptionPane.showInputDialog( parentComponent: null, message: "Please input the second number:"
15         );
16         JOptionPane.showMessageDialog( parentComponent: null, strNotification, title: "Show two numbers", JOptionPane
17         );
18         System.exit( status: 0);
19     }

```

Figure 11: 2.2.4d

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


```

1  package Lab_01;
2  //Example 6: Calculate.java4
3  import javax.swing.JOptionPane;
4  new *
5  public class Calculate {
6      new *
7      public static void main(String[] args){
8          String strNum1, strNum2;
9          strNum1 = JOptionPane.showInputDialog( parentComponent: null, message: "Please input the first number:");
10         strNum2 = JOptionPane.showInputDialog( parentComponent: null, message: "Please input the second number:");
11         double num1 = Double.parseDouble(strNum1);
12         double num2 = Double.parseDouble(strNum2);
13         double sum = num1 + num2;
14         double diff = num1 - num2;
15         double product = num1 * num2;
16         System.out.println(sum);
17         System.out.println(diff);
18         System.out.println(product);
19         if(num1 == 0 && num2 != 0){
20             System.out.println(0);
21         }else if(num2 == 0 && num1 != 0){
22             System.out.println(0);
23         }else if(num1 == 0 && num2 == 0){
24             System.out.println("Error! The quotient does not exist");
25         }else{
26             double a = num1/num2;
27             System.out.println(a);
28         }
29     }

```

Figure 12: 2.2.5a

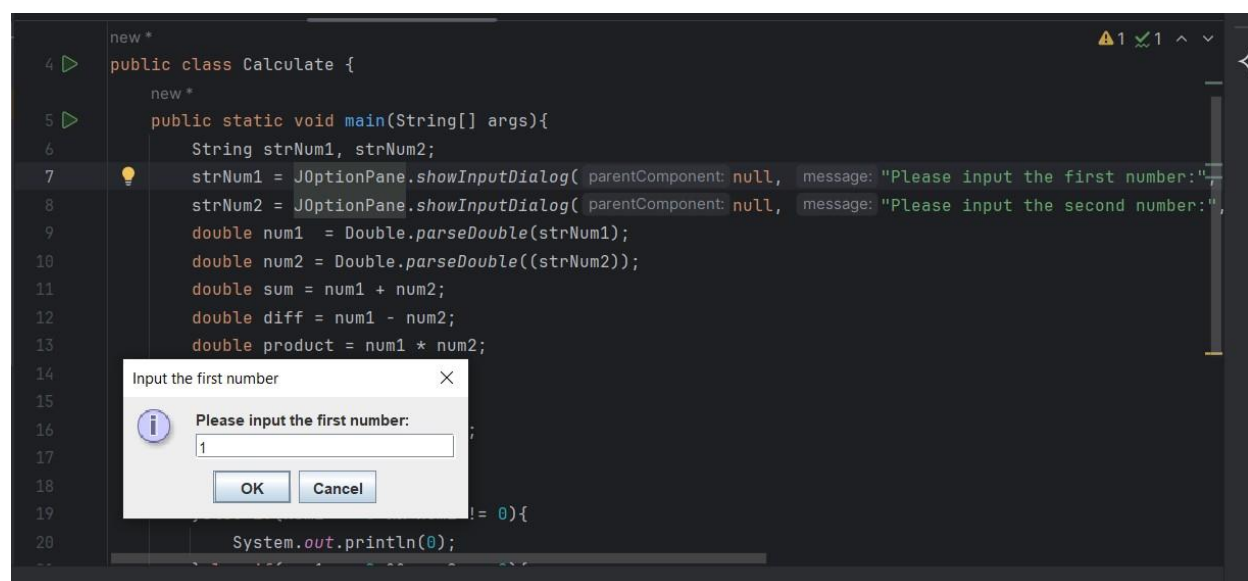
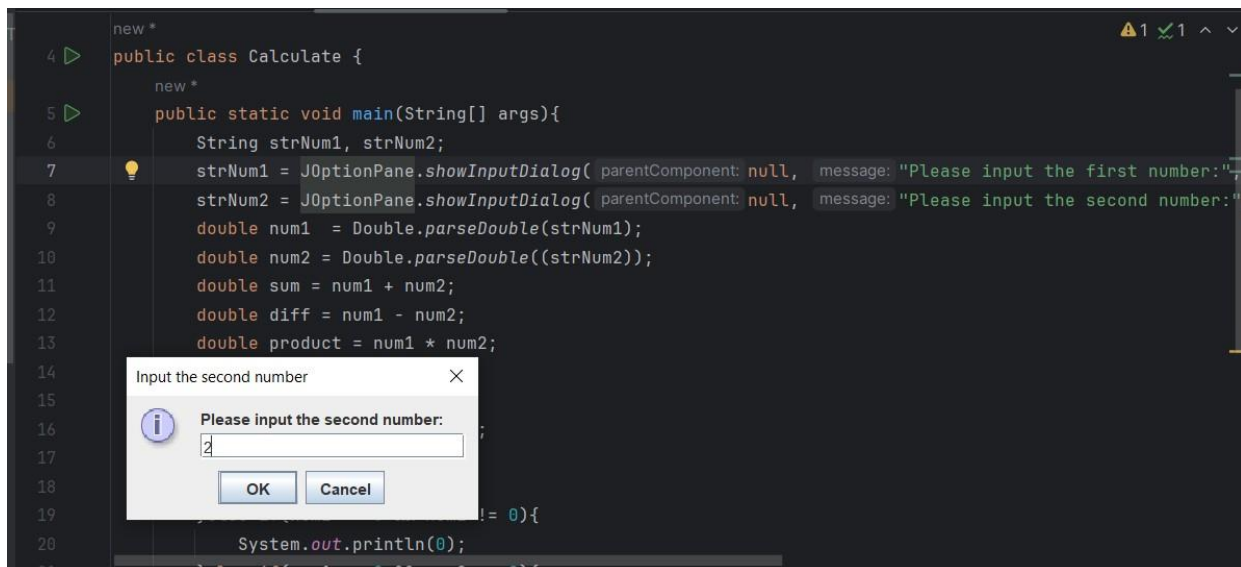


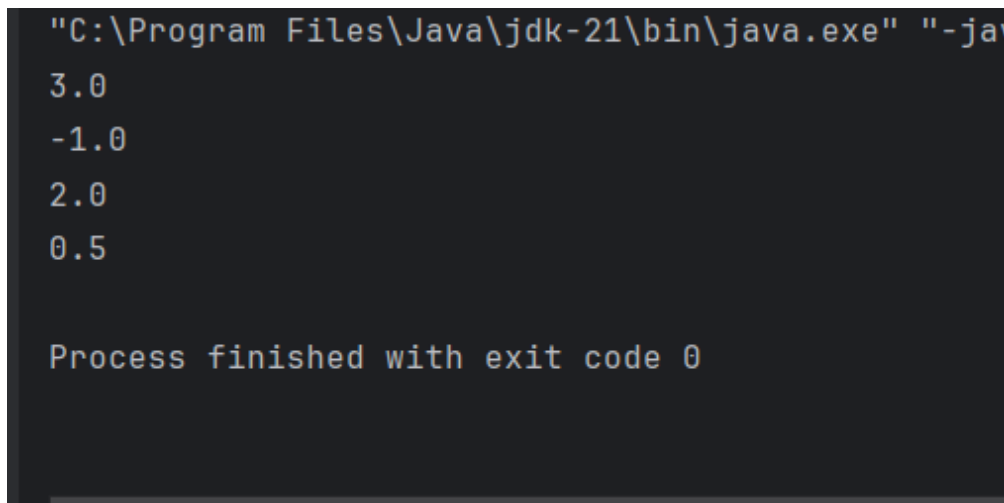
Figure 13: 2.2.5b



The screenshot shows an IDE with a Java file named `Calculate.java`. The code defines a `Calculate` class with a `main` method. It uses `JOptionPane` to prompt the user for two numbers. A dialog box titled "Input the second number" is overlaid on the code, showing the message "Please input the second number:" and a text field containing the value "2". The code calculates the sum, difference, and product of the two numbers and prints the sum.

```
new *
4 public class Calculate {
    new *
5     public static void main(String[] args){
6         String strNum1, strNum2;
7         strNum1 = JOptionPane.showInputDialog( parentComponent: null, message: "Please input the first number:");
8         strNum2 = JOptionPane.showInputDialog( parentComponent: null, message: "Please input the second number:");
9         double num1 = Double.parseDouble(strNum1);
10        double num2 = Double.parseDouble(strNum2);
11        double sum = num1 + num2;
12        double diff = num1 - num2;
13        double product = num1 * num2;
14
15
16
17
18
19        System.out.println(sum);
20    }
}
```

Figure 14: 2.2.5c



The screenshot shows a command prompt window with the following text:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-jav
3.0
-1.0
2.0
0.5

Process finished with exit code 0
```

Figure 15: 2.2.5d

2.2.6 Write a program to solve

```
1 package Lab_01;
2 //Example 7: SolveEquation.java4
3
4 import java.util.Scanner;
5 new *
6 public class SolveEquation {
7     new *
8     public static void main(String[] args) {
9         Scanner scanner = new Scanner(System.in);
10
11         System.out.println("Choose the type of equation to solve:");
12         System.out.println("1. First-degree equation with one variable");
13         System.out.println("2. System of first-degree equations with two variables");
14         System.out.println("3. Second-degree equation with one variable");
15         int choice = scanner.nextInt();
16
17         switch (choice) {
18             case 1:
19                 System.out.print("Enter the value of a: ");
20                 double a = scanner.nextDouble();
21                 System.out.print("Enter the value of b: ");
22                 double b = scanner.nextDouble();
23                 solveLinearEquation(a, b);
24                 break;
25             case 2:
26                 System.out.print("Enter the value of a11: ");
27                 double a11 = scanner.nextDouble();
28                 System.out.print("Enter the value of a12: ");
29                 double a12 = scanner.nextDouble();
30                 System.out.print("Enter the value of b1: ");
31                 double b1 = scanner.nextDouble();
```

Figure 16: 2.2.6a

```
30         System.out.print("Enter the value of a21: ");
31         double a21 = scanner.nextDouble();
32         System.out.print("Enter the value of a22: ");
33         double a22 = scanner.nextDouble();
34         System.out.print("Enter the value of b2: ");
35         double b2 = scanner.nextDouble();
36         solveLinearSystem(a11, a12, b1, a21, a22, b2);
37         break;
38     case 3:
39         System.out.print("Enter the value of a: ");
40         double quadraticA = scanner.nextDouble();
41         System.out.print("Enter the value of b: ");
42         double quadraticB = scanner.nextDouble();
43         System.out.print("Enter the value of c: ");
44         double quadraticC = scanner.nextDouble();
45         solveQuadraticEquation(quadraticA, quadraticB, quadraticC);
46         break;
47     default:
48         System.out.println("Invalid choice");
49     }
50 }
51
52 1 usage new *
53 public static void solveLinearEquation(double a, double b) {
54     if (a == 0) {
55         if (b == 0) {
56             System.out.println("Infinite solutions");
57         } else {
58             System.out.println("No solution");
59         }
60     } else {
```

Figure 17: 2.2.6b

```

59     } else {
60         double x = -b / a;
61         System.out.println("The solution is x = " + x);
62     }
63 }
64
1usage new *
65 public static void solveLinearSystem(double a11, double a12, double b1, double a21, double a22, double b2)
66     double determinant = a11 * a22 - a21 * a12;
67     if (determinant == 0) {
68         if ((b1 * a22 - b2 * a12) == 0) {
69             System.out.println("Infinite solutions");
70         } else {
71             System.out.println("No solution");
72         }
73     } else {
74         double x1 = (b1 * a22 - b2 * a12) / determinant;
75         double x2 = (a11 * b2 - a21 * b1) / determinant;
76         System.out.println("The solutions are x1 = " + x1 + ", x2 = " + x2);
77     }
78 }
79
1usage new *
80 public static void solveQuadraticEquation(double a, double b, double c) {
81     double discriminant = b * b - 4 * a * c;
82     if (discriminant > 0) {
83         double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);
84         double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);
85         System.out.println("The solutions are real and distinct: x1 = " + root1 + ", x2 = " + root2);
86     } else if (discriminant == 0) {
87         double root = -b / (2 * a);

```

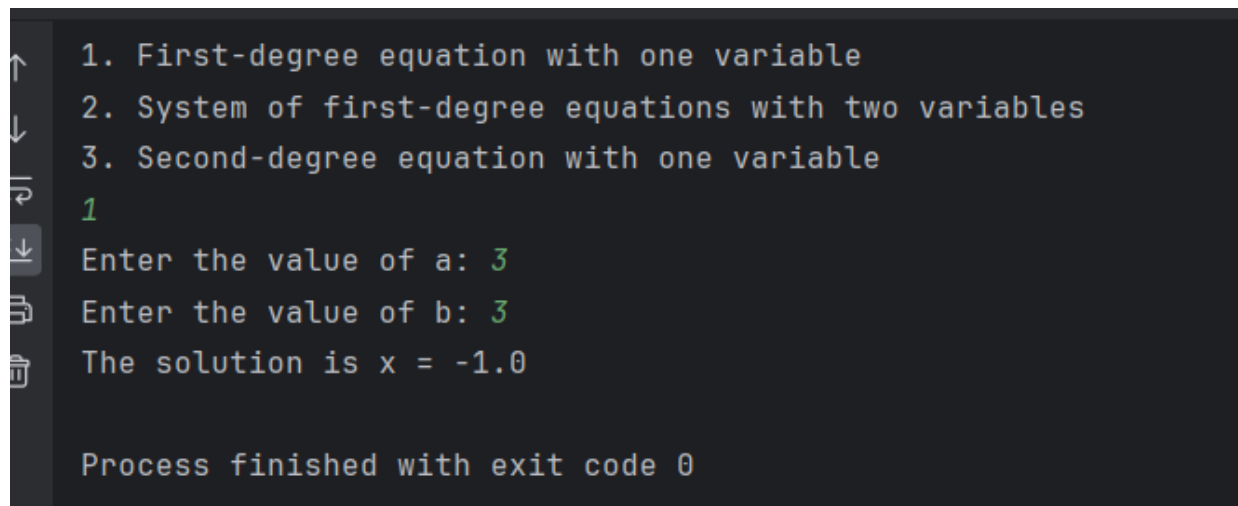
Figure 18: 2.2.6c

```

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

```

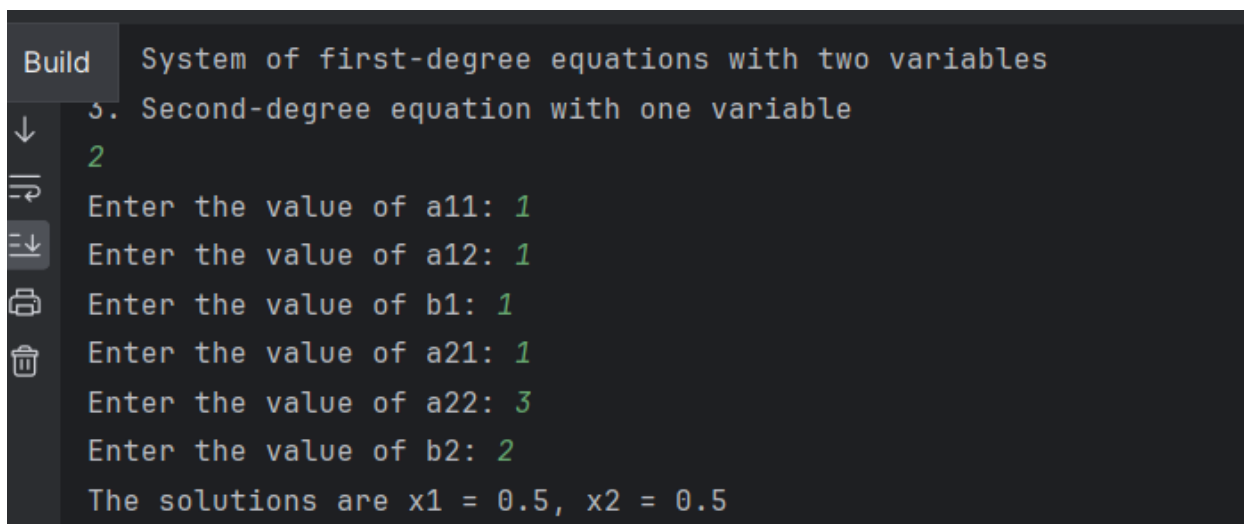
Figure 19: 2.2.6d



```
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
```

Figure 20: 2.2.6e



```
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
```

Figure 21: 2.2.6f

Exercises

6.1 Write, compile and run the ChoosingOption program:

```
1 package Lab_01;
2 import javax.swing.JOptionPane;
3 new *
4 public class ChoosingOption {
5     new *
6     public static void main(String[] args){
7         int option = JOptionPane.showConfirmDialog(parentComponent: null, message: "Do you want to change to the first class ticket?");
8         JOptionPane.showMessageDialog( parentComponent: null, message: "You've chosen: " +(option==JOptionPane.YES_OPTION? "YES":"NO"));
9         System.exit( status: 0);
10    }
```

Figure 22: 6.1a

Kết quả:

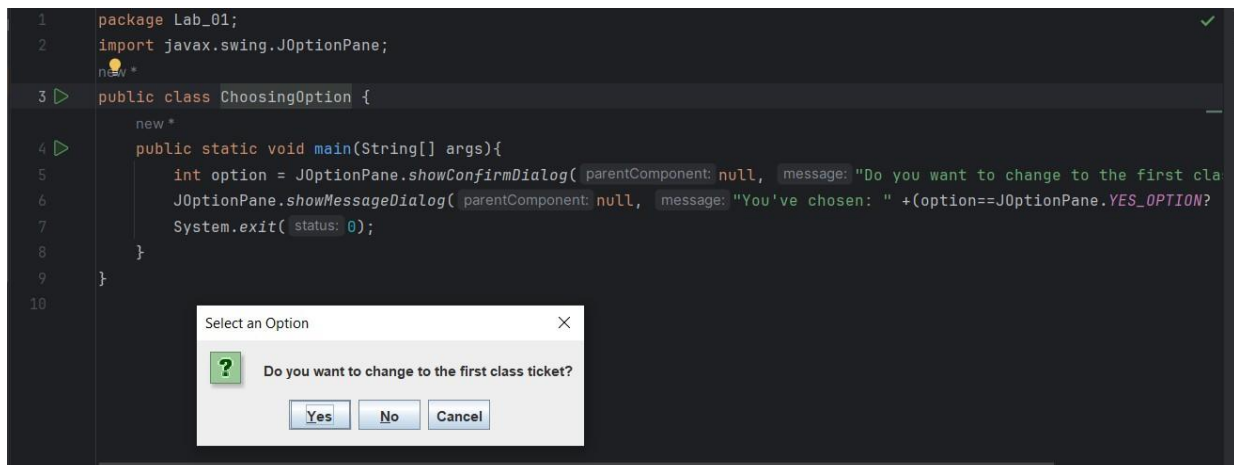


Figure 23: 6.1b

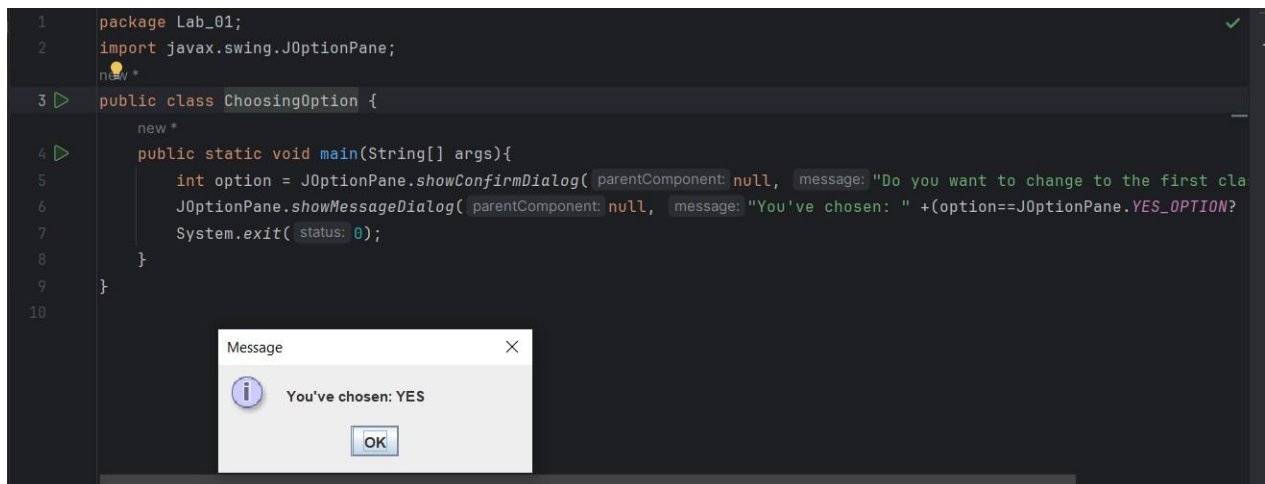


Figure 24: 6.1c

6.2 Write a program for input/output from keyboard

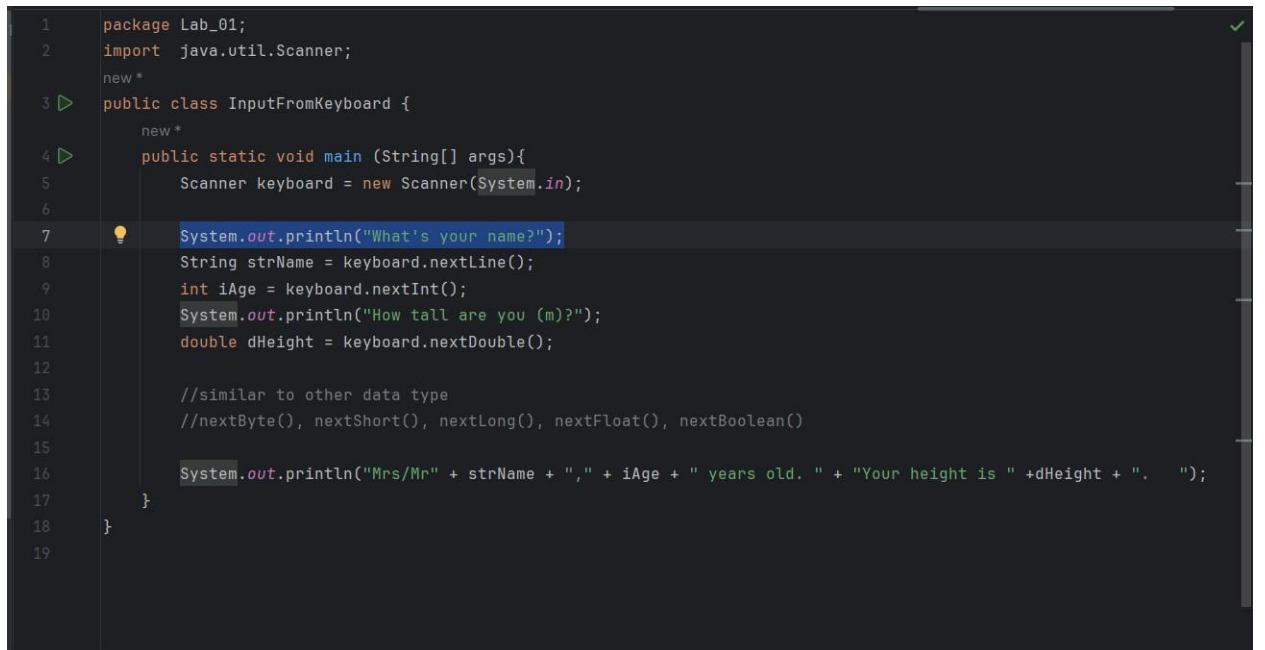


Figure 25: 6.2a

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
```

Figure 26: 6.2b

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

```
1 package Lab_01;
2 import java.util.Scanner;
3 new *
4 public class DisplayTriangle {
5     new *
6     public static void main(String[] args){
7         Scanner keyboard = new Scanner(System.in);
8         System.out.println("Hãy nhập số n");
9         int n = keyboard.nextInt();
10        int m = 1;
11        for(int i = 0; i < n; i++){
12            for(int k = 0; k < n - i; k++){
13                System.out.print(" ");
14            }
15            for(int j = 0; j < m; j++){
16                System.out.print("*");
17            }
18            System.out.print("\n");
19            m += 2;
20        }
21    }
```

Figure 27: 6.3a

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaa
Hãy nhập số n
5
      *
     ***
    *****
   *********
  ***********

Process finished with exit code 0
|
```

Figure 28: 6.3b

- 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

```
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();
        }
    }
}
```

Figure 29: 6.4a

```
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":
```

Figure 30: 6.4b

```
9   case "jun.":  
10  case "jun":  
11  case "6":  
12    month = 6;  
13    break;  
14  case "july":  
15  case "jul.":  
16  case "jul":  
17  case "7":  
18    month = 7;  
19    break;  
20  case "august":  
21  case "aug.":  
22  case "aug":  
23  case "8":  
24    month = 8;  
25    break;  
26  case "september":  
27  case "sep.":  
28  case "sep":  
29  case "9":  
30    month = 9;  
31    break;  
32  case "october":  
33  case "oct.":  
34  case "oct":  
35  case "10":  
36    month = 10;  
37    break;  
38  case "november":
```

Figure 31: 6.4c

```

        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:

```

Figure 32: 6.4c

```

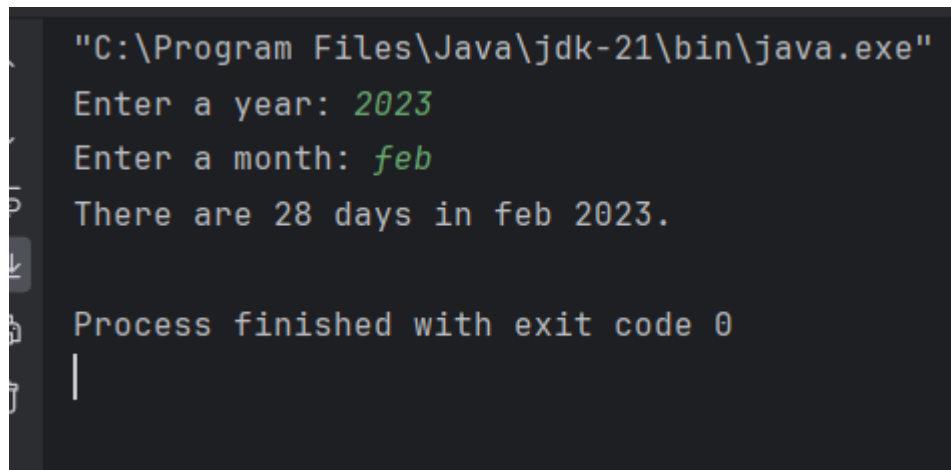
        break,
    case 2:
        daysInMonth = isLeapYear ? 29 : 28;
        break;
    default:
        daysInMonth = 31;
}

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

```

Figure 33: 6.4d

Kết quả:

A screenshot of a terminal window showing the execution of a Java program. The command prompt is "C:\Program Files\Java\jdk-21\bin\java.exe". The program prompts the user to "Enter a year:" and the input "2023" is shown. It then prompts "Enter a month:" and the input "feb" is shown. The output is "There are 28 days in feb 2023." The terminal also shows "Process finished with exit code 0" and a cursor on a new line.

```
"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  
|
```

Figure 34: 6.4e

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

```
1 package Lab_01;
2 > import ...
3 new *
4 public class Array {
5     new *
6     public static void main(String[] args){
7         double []a = new double[]{1789, 2035, 1899, 1456, 2013};
8         double sum = 0;
9         for(double number: a){
10             sum += number;
11         }
12         double average = sum / a.length;
13         Arrays.sort(a);
14         System.out.println("Array after sort: ");
15         System.out.println(Arrays.toString(a));
16
17         System.out.println("Sum of this array: ");
18         System.out.println(sum);
19
20         System.out.println("Average of this array: ");
21         System.out.println(average);
22     }
23 }
```

Figure 35: 6.5a

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
```

Figure 36: 6.5b

Figure 37: 6.5b

Figure 38: 6.5b

Figure 39: 6.5b

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

```

1  package Lab_01;
2  import java.util.Scanner;
   new *
3  ▶ public class AddMatrix {
   3 usages new *
4      public static void print(int [][]matrix){
5          for(int i = 0; i < 3; i++){
6              for(int j = 0; j < 3; j++){
7                  System.out.print(matrix[i][j]);
8                  System.out.print(" ");
9              }
10             System.out.println();
11         }
12     }
   new *

```

Figure 44: 6.6a

Figure 45: 6.6a

Figure 46: 6.6a

Figure 47: 6.6a

```

        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);
}
}

```

Figure 40: 6.6b

Figure 41: 6.6b

Figure 42: 6.6b

Figure 43: 6.6b

Kết quả:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-j
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
```

Figure 48: 6.6c

Figure 49: 6.6c

Figure 50: 6.6c

Figure 51: 6.6c