

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

**BÁO CÁO THỰC HÀNH**  
**IT3103-744527-2024.1**  
**BÀI THỰC HÀNH -LAB01**

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## BÁO CÁO THỰC HÀNH LAB 01

### The Very First Java Programs

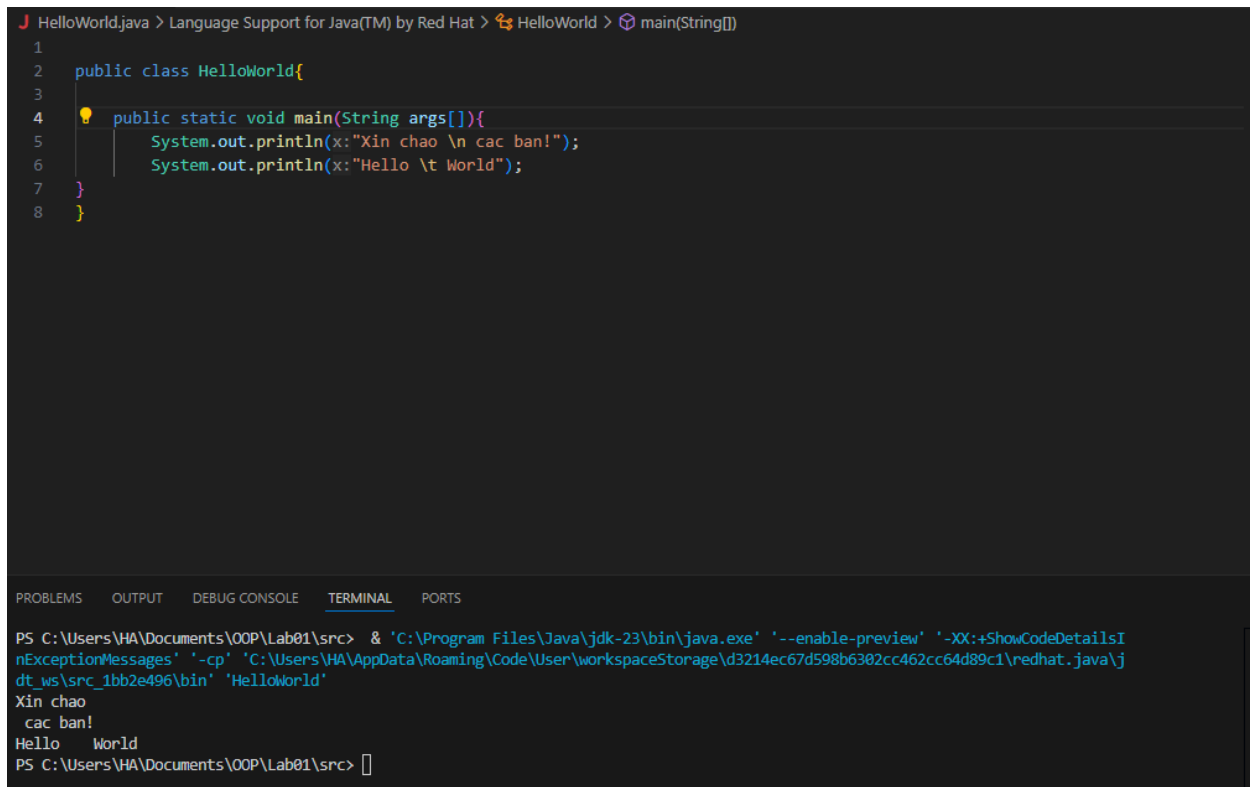
#### 2.2.1 Write, compile the first Java application:

```

1 //Example 1: HelloWorld.java
2 //Text-printing program
3 public class HelloWorld {
4
5     public static void main(String args[]){
6         System.out.println("Xin chao \n cac ban!");
7         System.out.println("Hello \t world!");
8
9     } // end of method main
10 }
```

Figure 1:2.1 Source code

### Kết quả



The screenshot shows an IDE window with the following content:

**Source Code (HelloWorld.java):**

```

1 public class HelloWorld{
2
3     public static void main(String args[]){
4         System.out.println(x:"Xin chao \n cac ban!");
5         System.out.println(x:"Hello \t World");
6     }
7 }
8 
```

**Terminal Output:**

```

PS C:\Users\HA\Documents\OOP\Lab01\src> & 'C:\Program Files\Java\jdk-23\bin\java.exe' '--enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\HA\AppData\Roaming\Code\User\workspaceStorage\d3214ec67d598b6302cc462cc64d89c1\redhat.java\jdt_ws\src_1bb2e496\bin' 'HelloWorld'
Xin chao
cac ban!
Hello    World
PS C:\Users\HA\Documents\OOP\Lab01\src> 
```

Figure 2:2.1 Result

### 2.2.2 Write, compile the first dialog Java program

```
1 // Example 2: FirstDialog.java
2 import javax.swing.JOptionPane;
3 public class FirstDialog{
4     public static void main(String[] args){
5         JOptionPane.showMessageDialog(null,"Hello world! How are you?");
6         System.exit(0);
7     }
8 }
```

Figure 3:2.2 Source code

### Kết quả

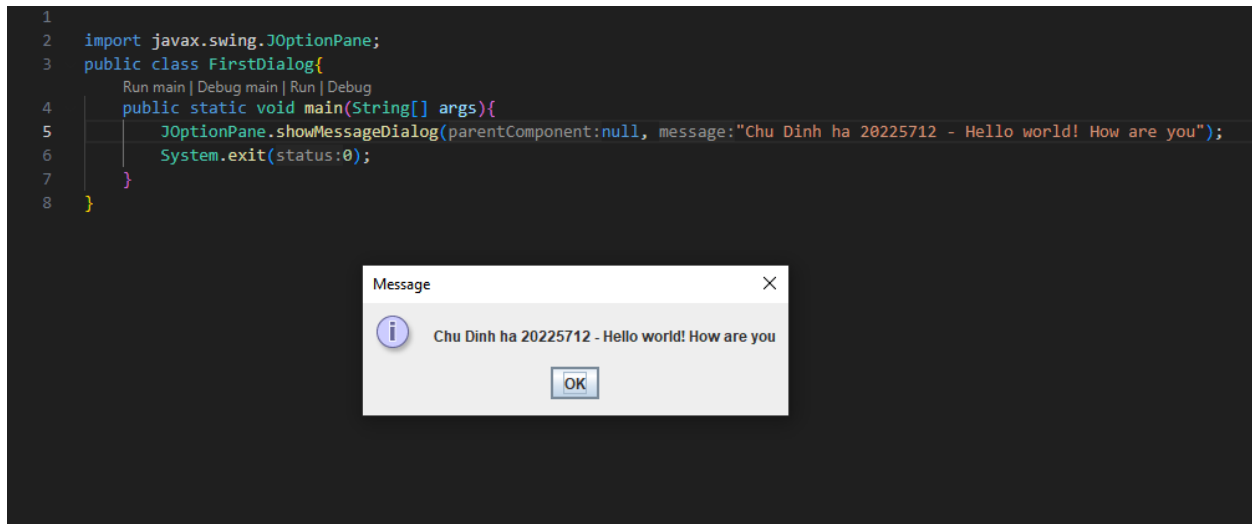


Figure 4:2.2 Result

### 2.2.3 Write, compile the first input dialog Java application

```

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

```

Figure 5:2.3 Source code

### Kết quả

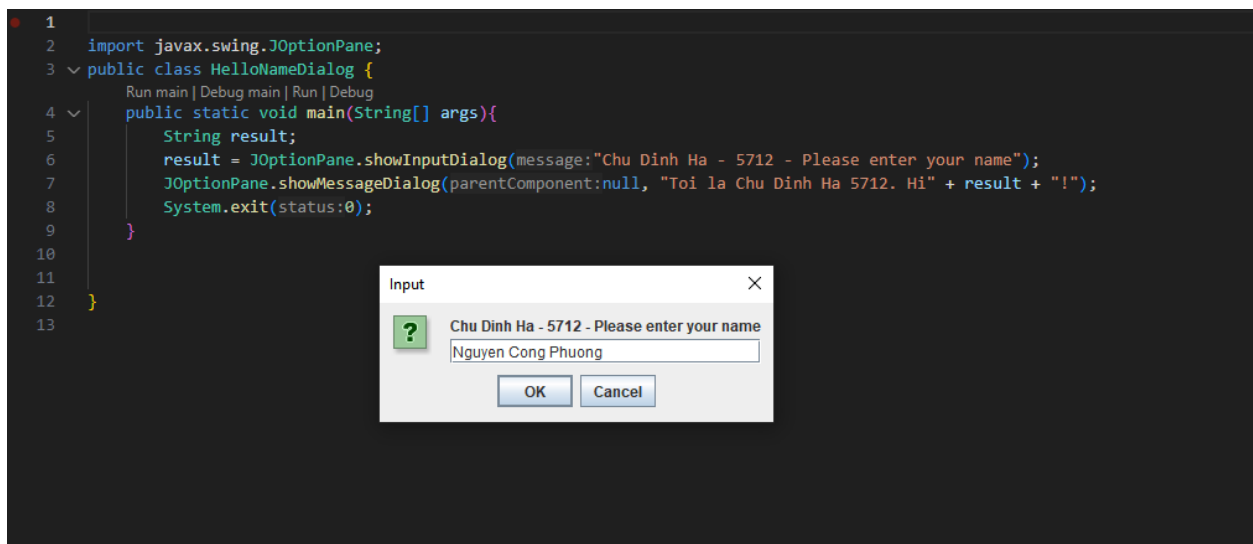
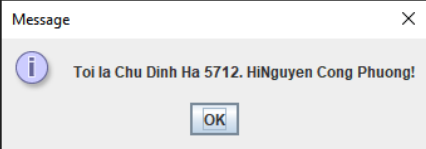


Figure 6:2.3 Result(1)

```
1
2 import javax.swing.JOptionPane;
3 public class HelloNameDialog {
4     public static void main(String[] args){
5         String result;
6         result = JOptionPane.showInputDialog(message:"Chu Dinh Ha - 5712 - Please enter your name");
7         JOptionPane.showMessageDialog(parentComponent:null, "Toi la Chu Dinh Ha 5712. Hi" + result + "!");
8         System.exit(status:0);
9     }
10
11 }
12
13
```



*Figure 7:2.3 Result(2)*

## 2.2.4 Write, compile, and run the following example:

```

1 // Example 5: ShowTwoNumbers.java
2 import javax.swing.JOptionPane;
3 public class ShowTwoNumbers {
4     public static void main(String[] args){
5         String strNum1, strNum2;
6         String strNotification = "You've just entered: ";
7
8         strNum1 = JOptionPane.showInputDialog(null,
9             "Please input the first number: ", "Input the first number",
10             JOptionPane.INFORMATION_MESSAGE);
11         strNotification += strNum1 + " and ";
12
13         strNum2 = JOptionPane.showInputDialog(null,
14             "Please input the second number: ", "Input the second number",
15             JOptionPane.INFORMATION_MESSAGE);
16         strNotification += strNum2;
17
18         JOptionPane.showMessageDialog(null, strNotification,
19             "Show two numbers", JOptionPane.INFORMATION_MESSAGE);
20         System.exit(0);
21     }
22 }

```

Figure 8:2.4 Source code

## Kết quả

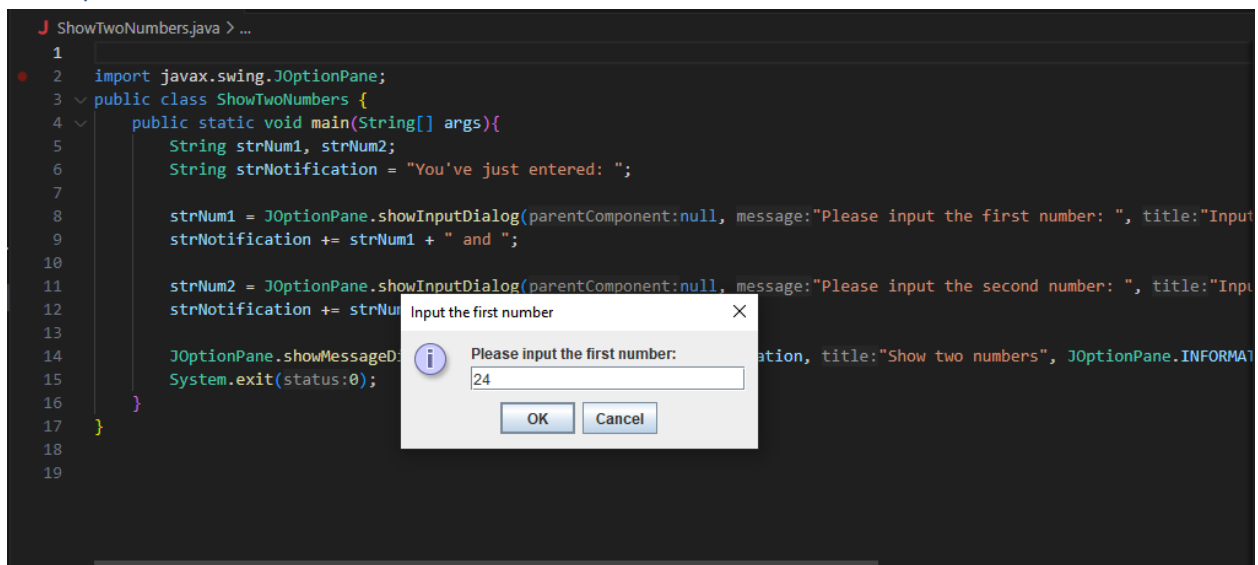


Figure 9: 2.4 Result(1)



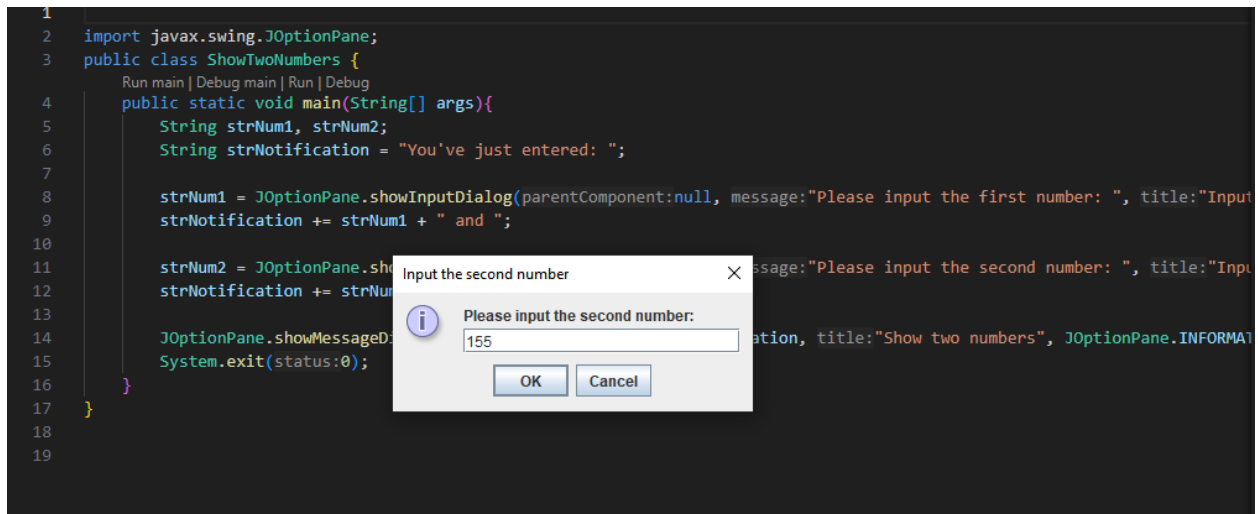


Figure 10:2.4 Result(2)

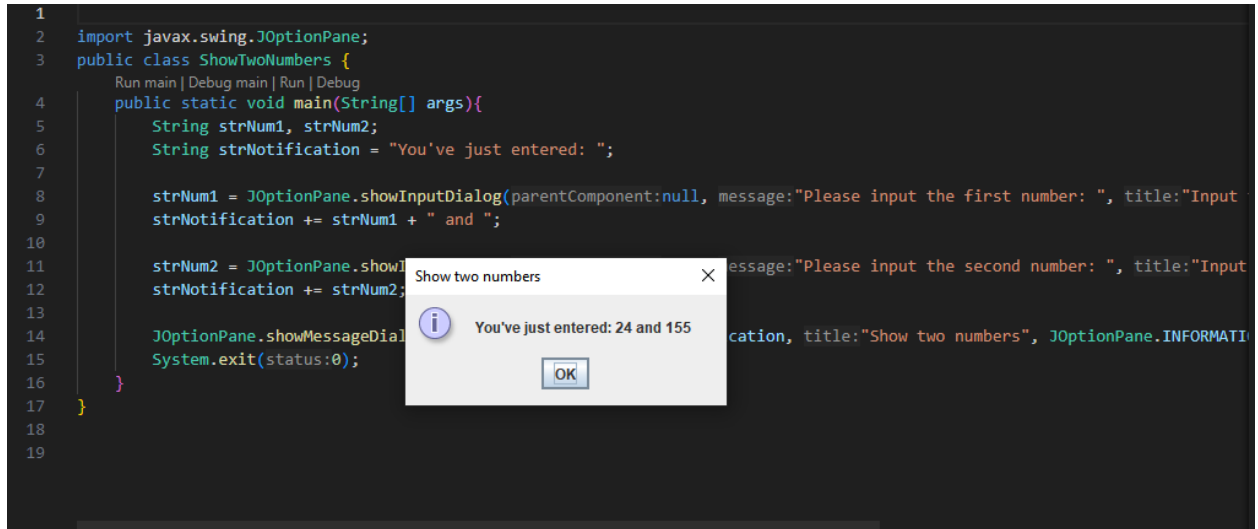


Figure 11:2.4 Result(3)

## BÀI TẬP

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

```

1  import javax.swing.JOptionPane;
2  public class Math2numbers {
3      public static void main(String[] args){
4          String strNum1, strNum2;
5
6          strNum1 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Dinh Ha - 5712 - Please input the first num1");
7
8          strNum2 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Dinh Ha - 5712 - Please input the second num2");
9
10         double num1 = Double.parseDouble(strNum1);
11         double num2 = Double.parseDouble(strNum2);
12
13         System.out.println(x:"Sum: ");
14         System.out.println(num1 + num2);
15         System.out.println(x:"Difference: ");
16         System.out.println(num1 - num2);
17         System.out.println(x:"Product: ");
18         System.out.println(num1 * num2);
19         System.out.println(x:"Division:");
20         System.out.println(num1 / num2);
21         System.out.println(num2 / num1);
22
23         System.exit(status:0);
24     }
25 }

```

Figure 12:2.5 Source code

Kết quả

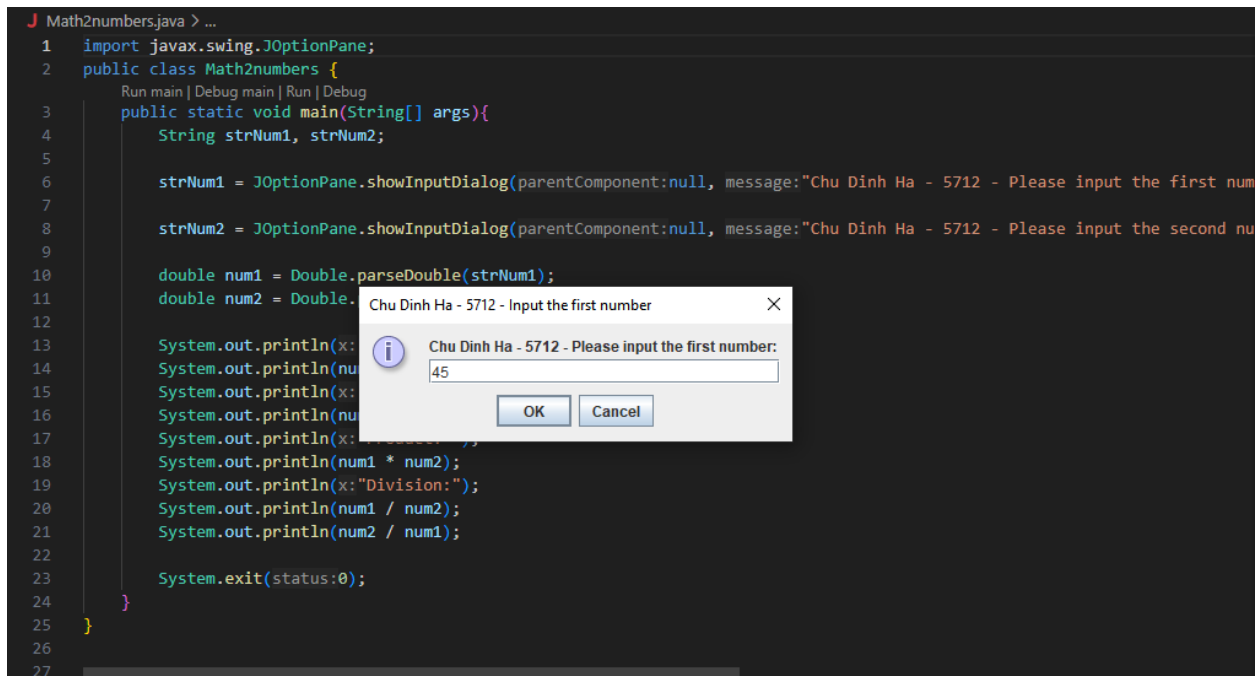


Figure 13:2.5 Result(1)

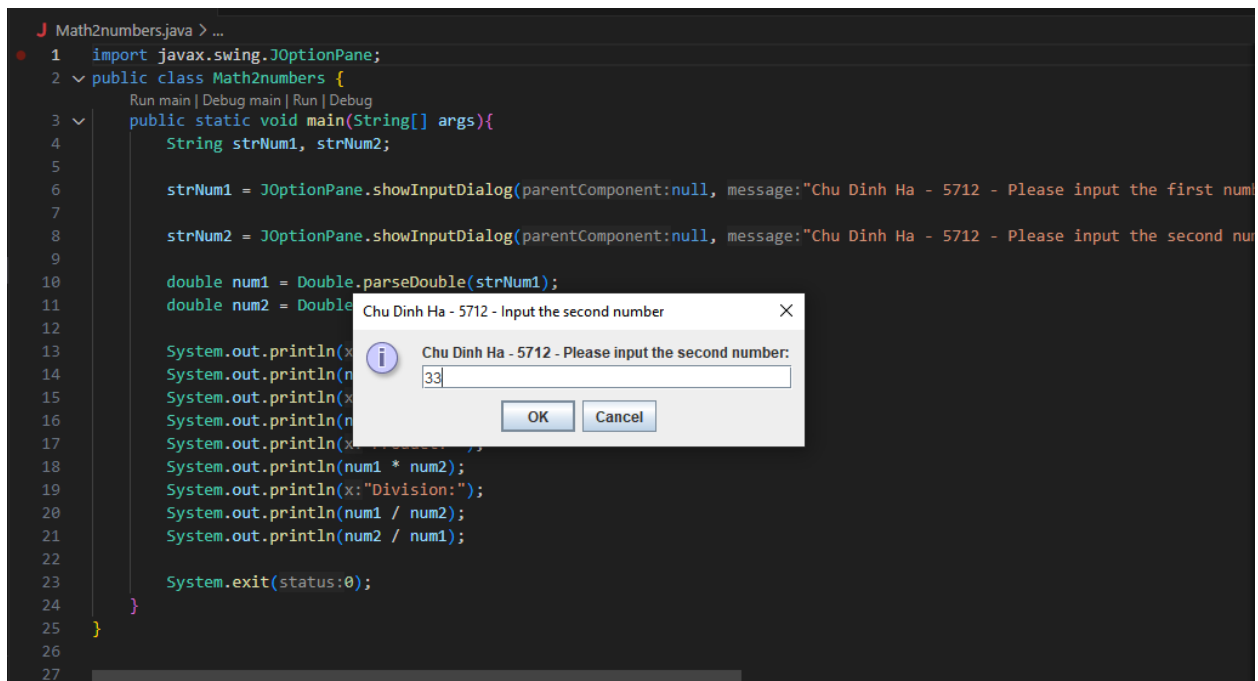


Figure 14:2.5 Result(2)

```

J Math2numbers.java > ...
1  import javax.swing.JOptionPane;
2  public class Math2numbers {
    Run main | Debug main | Run | Debug
3      public static void main(String[] args){
4          String strNum1, strNum2;
5
6          strNum1 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Đình Hà - 5712 - Please input the first num
7
8          strNum2 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Đình Hà - 5712 - Please input the second nu
9
10         double num1 = Double.parseDouble(strNum1);
11         double num2 = Double.parseDouble(strNum2);
12
13         System.out.println(x:"Sum: ");
14         System.out.println(num1 + num2);
15         System.out.println(x:"Difference: ");
16         System.out.println(num1 - num2);
17         System.out.println(x:"Product: ");
    }
}

```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

```

e' '--enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\HA\AppData\Roaming\Code\User\workspaceStorage\d321
4ec67d598b6302cc462cc64d89c1\redhat.java\jdt_ws\src_1bb2e496\bin' 'Math2numbers'
Sum:
78.0
Difference:
12.0
Product:
1485.0
Division:
1.3636363636363635
0.7333333333333333

```

Figure 15:2.5 Result(3)

## 2.2.6 Write a program to solve:

*For simplicity, we only consider the real roots of the equations in this task.*

- 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

```

1  import java.util.Scanner;
2  import java.lang.Math;
3  public class Equation {
4      public static void main(String[] args) {
5          Scanner keyboard = new Scanner(System.in);
6
7          System.out.println(x:"Enter a: ");
8          Double a = keyboard.nextDouble();
9
10         System.out.println(x:"Enter b: ");
11         Double b = keyboard.nextDouble();
12
13         System.out.println("Equation: " + a + "x + " + b + " = 0");
14         if(a == 0) {
15             if(b == 0) {
16                 System.out.println(x:"Infinite solution");
17             }else{
18                 System.out.println(x:"No solution");
19             }
20         }else{
21             Double x = -b/a;
22             System.out.println("Solution: x= " + x);
23         }
24     }

```

Figure 16:2.6 Source code(1)

```

25
26     System.out.println(x:"Enter a1: ");
27     Double a1 = keyboard.nextDouble();
28
29     System.out.println(x:"Enter b1: ");
30     Double b1 = keyboard.nextDouble();
31
32     System.out.println(x:"Enter c1: ");
33     Double c1 = keyboard.nextDouble();
34
35     System.out.println(x:"Enter a2: ");
36     Double a2 = keyboard.nextDouble();
37
38     System.out.println(x:"Enter b2: ");
39     Double b2 = keyboard.nextDouble();
40
41     System.out.println(x:"Enter c2: ");
42     Double c2 = keyboard.nextDouble();
43
44     System.out.println(x:"Equation: ");
45     System.out.println(a1 + "x + " + b1 + "y = " + c1);
46     System.out.println(a2 + "x + " + b2 + "y = " + c2);
47
48     Double d = a1*b2 - a2*b1;
49     Double d1 = c1*b2 - c2*b1;
50     Double d2 = a1*c2 - a2*c1;

```

Figure 17:2.6 Source code(2)

```

51
52     if(d==0) {
53         if(d1 == 0 && d2 == 0) {
54             System.out.println(x:"Infinite solution");
55         } else {
56             System.out.println(x:"No solution");
57         }
58     } else {
59         Double x1 = d1/d;
60         Double x2 = d2/d;
61         System.out.println("Solution: x1 = " + x1 + ", x2 = " + x2);
62     }
63
64     System.out.println(x:"Enter a: ");
65     Double a3 = keyboard.nextDouble();
66
67     System.out.println(x:"Enter b: ");
68     Double b3 = keyboard.nextDouble();
69
70     System.out.println(x:"Enter c: ");
71     Double c3 = keyboard.nextDouble();
72
73     System.out.println("Equation: " + a3 + "x^2 + " + b3 + "x + " + c3 + " = 0");
74     Double delta = b3*b3 - 4*a3*c3;

```

Figure 18:2.6 Source code(3)

```

75
76     if(a3==0) {
77         if(b3==0) {
78             if(c3==0) {
79                 System.out.println("Infinite solution");
80             } else {
81                 System.out.println("No solution");
82             }
83         } else {
84             Double x = -c3/b3;
85             System.out.println("Solution x = " + x);
86         }
87     } else {
88         if(delta<0) {
89             System.out.println("No Solution");
90         } else if(delta==0) {
91             Double x = (-b3/2)*a3;
92             System.out.println("Solution: x1 = x2 = " + x);
93         } else {
94             Double x1 = (-b3-Math.sqrt(delta))/(2*a3);
95             Double x2 = (-b3+Math.sqrt(delta))/(2*a3);
96             System.out.println("Solution: x1 = " + x1 + ", x2 = " + x2);
97         }
98     }
99     keyboard.close();
100 }
101 }

```

Figure 19:2.6 Source code(4)

Kết quả

```
Enter a:
3
Enter b:
4
Equation:  $3.0x + 4.0 = 0$ 
Solution:  $x = -1.3333333333333333$ 
Enter a1:
4
Enter b1:
5
Enter c1:
10
Enter a2:
9
Enter b2:
12
Enter c2:
15
Equation:
 $4.0x + 5.0y = 10.0$ 
 $9.0x + 12.0y = 15.0$ 
Solution:  $x1 = 15.0, x2 = -10.0$ 
Enter a:
9
Enter b:
4
Enter c:
36
Equation:  $9.0x^2 + 4.0x + 36.0 = 0$ 
No Solution
```

Figure 20:2.6 Result

## 6.1 Write, compile and run the ChoosingOption program:

```

1 import javax.swing.JOptionPane;
2 public class ChoosingOption{
3     public static void main(String[] args){
4         int option = JOptionPane.showConfirmDialog(null,
5             "Do you want to change to the first class ticket?");
6
7         JOptionPane.showMessageDialog(null,"You've chosen: "
8             + (option==JOptionPane.YES_OPTION?"Yes":"No"));
9         System.exit(0);
10    }
11 }

```

Figure 21:6.1 Source code

## Kết quả

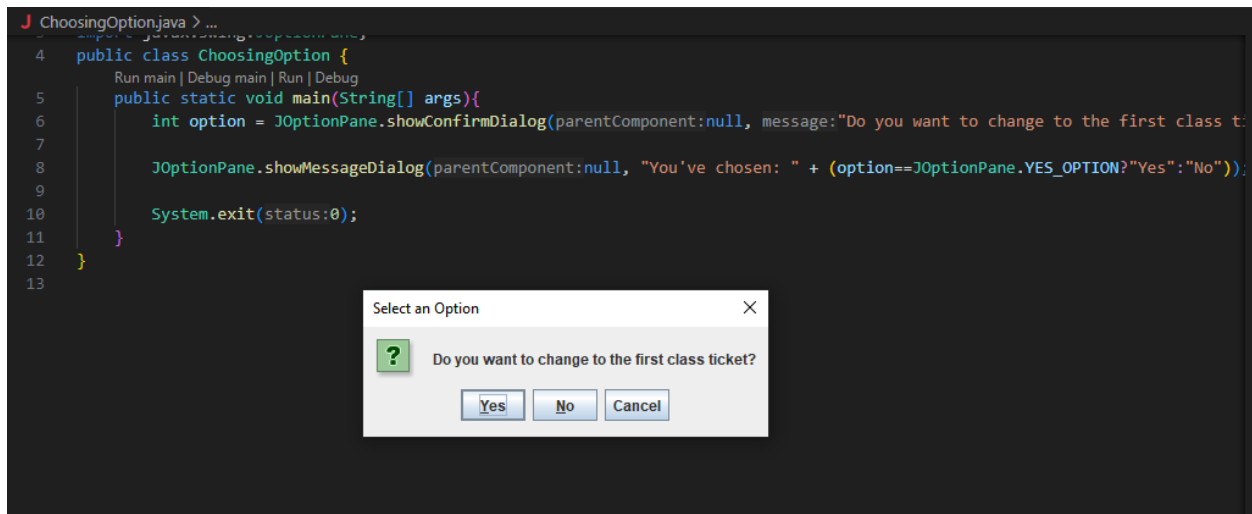
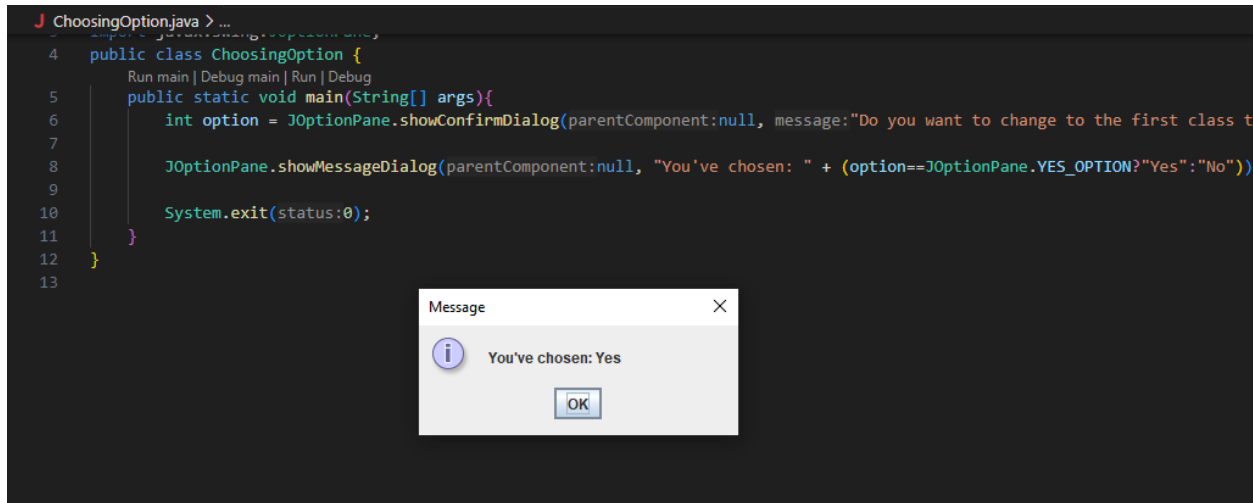


Figure 22:6.1 Result(1)





*Figure 23:6.1 Result(2)*

## 6.2 Write a program for input/output from keyboard

```

1  import java.util.Scanner;
2  public class InputFromKeyboard{
3      public static void main(String args[]){
4      Scanner keyboard = new Scanner(System.in);
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     //similar to other data types
14     //nextByte(), nextShort(), nextLong()
15     //nextFloat(), nextBoolean()
16
17     System.out.println("Mrs/Ms. " + strName + ", " + iAge + " years old. "
18         + "Your height is " + dHeight + ".");
19
20     }
21 }

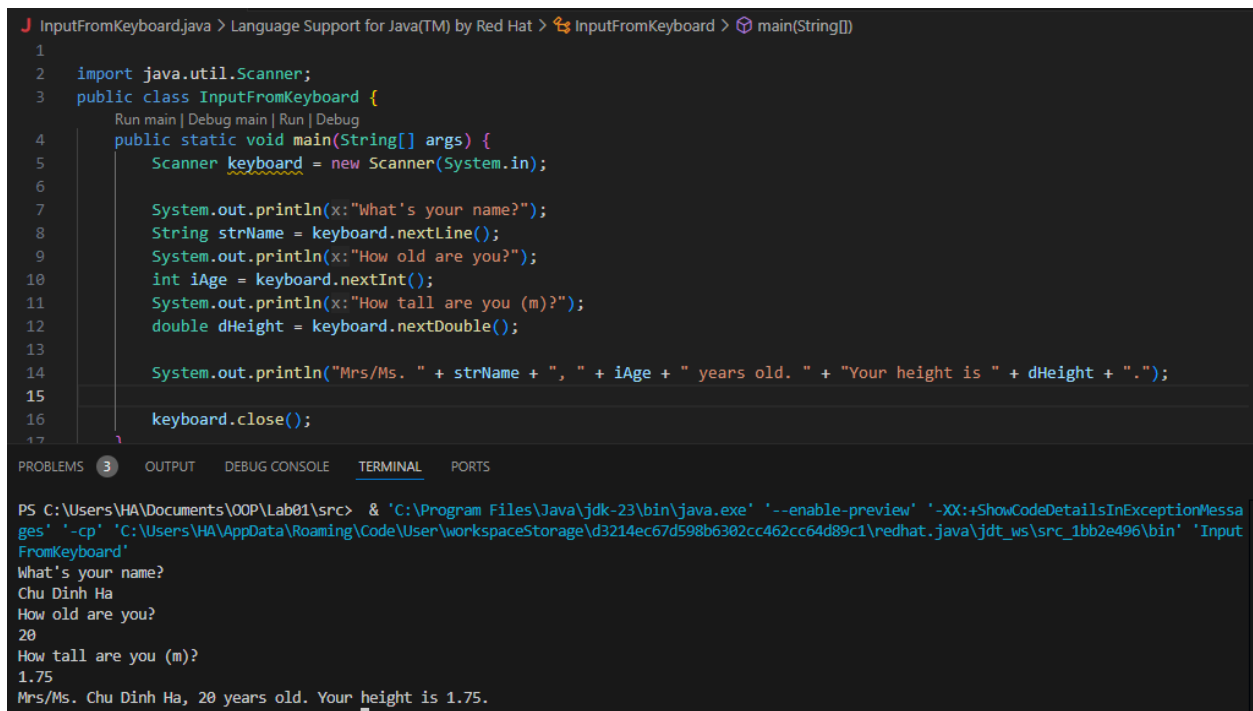
```

Markers Properties Servers Data Source Explorer Snippets Problems Console Search

<terminated> InputFromKeyboard [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0\_171.jdk/Contents/Home/bin/  
 What's your name?  
 Trang  
 How old are you?  
 35  
 How tall are you (m)?  
 1.65  
 Mrs/Ms. Trang, 35 years old. Your height is 1.65.

Figure 24:6.2 Source code

Kết quả



The screenshot displays an IDE window with a Java file named `InputFromKeyboard.java`. The code uses the `Scanner` class to read user input for name, age, and height, then prints a formatted string. Below the code editor, the `TERMINAL` tab shows the command prompt output, which matches the program's execution results.

```
1 import java.util.Scanner;
2 public class InputFromKeyboard {
3     Run main | Debug main | Run | Debug
4     public static void main(String[] args) {
5         Scanner keyboard = new Scanner(System.in);
6
7         System.out.println(x:"What's your name?");
8         String strName = keyboard.nextLine();
9         System.out.println(x:"How old are you?");
10        int iAge = keyboard.nextInt();
11        System.out.println(x:"How tall are you (m)?");
12        double dHeight = keyboard.nextDouble();
13
14        System.out.println("Mrs/Ms. " + strName + ", " + iAge + " years old. " + "Your height is " + dHeight + ".");
15
16        keyboard.close();
17    }
```

PROBLEMS 3 OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

```
PS C:\Users\HA\Documents\OOP\Lab01\src> & 'C:\Program Files\Java\jdk-23\bin\java.exe' '-enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\HA\AppData\Roaming\Code\User\workspaceStorage\d3214ec67d598b6302cc462cc64d89c1\redhat.java\jdt_ws\src_1bb2e496\bin' 'InputFromKeyboard'
What's your name?
Chu Dinh Ha
How old are you?
20
How tall are you (m)?
1.75
Mrs/Ms. Chu Dinh Ha, 20 years old. Your height is 1.75.
```

*Figure 25:6.2 Result*

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

E.g. n=5:

```

      *
    ***
  *****
*****
*****
*****

```

```

2
3  import java.util.Scanner;
4
5  public class Starheight {
6      public static void main(String[] args) {
7          Scanner keyboard = new Scanner(System.in);
8          System.out.println(x:"Enter the value of n: ");
9
10         int n = keyboard.nextInt();
11         System.out.println("The triangle's height is: " + n);
12
13         for(int i = 1; i <= n; i++){
14             for(int x = 1; x <= n - i; x++){
15                 System.out.printf(format:" ");
16             }
17             for(int j = 1; j <= 2*i-1; j++){
18                 System.out.printf(format:"*");
19             }
20             System.out.println(x:"");
21         }
22
23         keyboard.close();
24     }
25 }
26

```

Figure 26:6.3 Source code

Kết quả

```
Enter the value of n:
7
The triangle's height is: 7
  *
 ***
*****
*****
*****
*****
*****
```

*Figure 27:6.3 Result*

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.

Month	January	February	March	April	May	June	July	August	September	October	November	December
Abbreviation	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
In 3 letters	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Number	1	2	3	4	5	6	7	8	9	10	11	12
Days of Month in Common Year	31	28	31	30	31	30	31	31	30	31	30	31
Days of Month in Leap Year	31	29	31	30	31	30	31	31	30	31	30	31

```

J DaysofMonthandYear.java > Language Support for Java(TM) by Red Hat > DaysofMonthandYear > main(String[])
1  import java.util.Scanner;
2  public class DaysofMonthandYear {
    Run main | Debug main | Run | Debug
3      public static void main(String[] args) {
4          Scanner keyboard = new Scanner(System.in);
5
6          int day = 0;
7          int month = 0;
8          int isCorrect = 0;
9
10         do{
11             System.out.print(s:"Enter the month: ");
12             String strName = keyboard.nextLine();
13

```

Figure 28:6.4 Source code(1)

```
14  switch (strName) {  
15      case "January":  
16          isCorrect = 1;  
17          month = 1;  
18          break;  
19      case "Jan":  
20          isCorrect = 1;  
21          month = 1;  
22          break;  
23      case "Jan."  
24          isCorrect = 1;  
25          month = 1;  
26          break;  
27      case "1":  
28          isCorrect = 1;  
29          month = 1;  
30          break;  
31      case "Febuary":  
32          isCorrect = 1;  
33          month = 2;  
34          break;  
35      case "Feb":  
36          isCorrect = 1;  
37          month = 2;  
38          break;
```

*Figure 29:6.4 Source code(2)*

```

39         case "Feb.":
40             isCorrect = 1;
41             month = 2;
42             break;
43         case "2":
44             isCorrect = 1;
45             month = 2;
46             break;
47         case "March":
48             isCorrect = 1;
49             month = 3;
50             break;
51         case "Mar":
52             isCorrect = 1;
53             month = 3;
54             break;
55         case "Mar.":
56             isCorrect = 1;
57             month = 3;
58             break;
59         case "3":
60             isCorrect = 1;

```

Figure 30:6.4 Source code(3)

Tương tự với các tháng còn lại

```

204     }while(isCorrect == 0);
205
206     int year;
207     do{
208         System.out.print(s:"Enter the year: ");
209         year = keyboard.nextInt();
210     }while(year < 0);
211
212     int Leapyear = 0;
213     if((year % 4) == 0 & (year % 100) != 0){
214         Leapyear = 1;
215     }else if((year % 400) == 0){
216         Leapyear = 1;
217     }

```

Figure 31:6.4 Source code(4)



```
218      switch (month) {  
219          case 1:  
220              day = 31;  
221              break;  
222          case 2:  
223              if (Leapyear == 1) day = 29;  
224              else day = 28;  
225              break;  
226          case 3:  
227              day = 31;  
228              break;  
229          case 4:  
230              day = 30;  
231              break;  
232          case 5:  
233              day = 31;  
234              break;  
235          case 6:  
236              day = 30;  
237              break;  
238          case 7:  
239              day = 31;  
240              break;  
241          case 8:  
242              day = 31;  
243              break;
```

Figure 32:6.4 Source code(5)

```

244         case 9:
245             day = 30;
246             break;
247         case 10:
248             day = 31;
249             break;
250         case 11:
251             day = 30;
252             break;
253         case 12:
254             day = 31;
255             break;
256     }
257     System.out.println("Days of the month: " + day);
258     keyboard.close();
259 }
260
261 }
262

```

Figure 33:6.4 Source code(6)

## Kết quả

```

Enter the month: May
Enter the year: 1997
Days of the month: 31

```

Figure 34:6.4 Result(1)

```

Enter the month: 2
Enter the year: 1800
Days of the month: 28

```

Figure 35:6.4 Result(2)

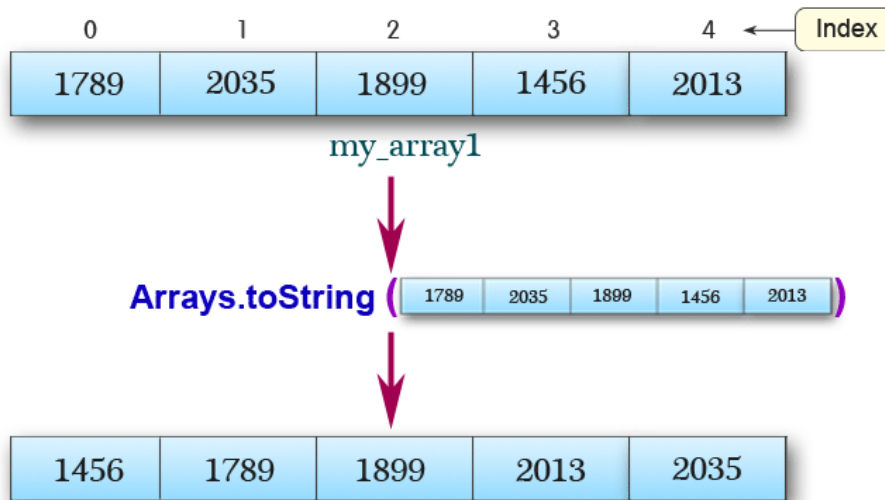
```

Enter the month: Feb.
Enter the year: 2004
Days of the month: 29

```

Figure 36:6.4 Result(3)

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



```

J ArraySortSumAvg.java > Language Support for Java(TM) by Red Hat > ArraySortSumAvg > main(String[])
1  import java.util.Scanner;
2  public class ArraySortSumAvg {
3      Run main | Debug main | Run | Debug
4      public static void main(String[] args){
5          Scanner keyboard = new Scanner(System.in);
6
7          int[] arr = new int[30];
8          System.out.println(x:"Enter array's length: ");
9          int n = keyboard.nextInt();
10
11         int sum = 0;
12         System.out.println(x:"Enter array");
13         for(int i = 0; i < n; i++){
14             arr[i] = keyboard.nextInt();
15             sum += arr[i];
16         }
17
18         double avg = sum/arr.length;
19         for(int i = 0; i < n - 1; i++){
20             for(int j = 0; j < n - i - 1; j++){
21                 if(arr[j] > arr[j + 1]){
22                     int tmp = arr[j];
23                     arr[j] = arr[j + 1];
24                     arr[j + 1] = tmp;
25                 }
26             }
27         }
28     }
29 }

```

Figure 37:6.5 Source code(1)

```
27
28     System.out.println(x:"Array after sorted: ");
29     for(int i = 0; i < n; i++)
30     {
31         System.out.printf(arr[i] + " ");
32     }
33     System.out.println(x:"");
34     System.out.println("Sum of array: " + sum);
35     System.out.println("Average value: " + avg);
36
37     keyboard.close();
38 }
```

*Figure 38:6.5 Source code(2)*

### *Kết quả*

```
Enter array's length:
7
Enter array
3
65
88
179
81523
1234
9
Array after sorted:
3 9 65 88 179 1234 81523
Sum of array: 83101
Average value: 2770.0
```

*Figure 39:6.5 Result*

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



```

TwoMatrices.java > Language Support for Java(TM) by Red Hat > TwoMatrices > main(String[])
1  import java.util.Scanner;
2  public class TwoMatrices {
    Run main | Debug main | Run | Debug
3      public static void main(String[] args){
4          Scanner keyboard = new Scanner(System.in);
5          System.out.println(x:"Enter the size of matrix (n x m): ");
6
7          int n = keyboard.nextInt();
8          int m = keyboard.nextInt();
9
10         int[][] a;
11         a = new int[20][20];
12
13         System.out.println(x:"Enter matrix A: ");
14         for(int i = 0; i < n; i++){
15             for(int j = 0; j < m; j++){
16                 a[i][j]= keyboard.nextInt();
17             }
18         }
19         System.out.println(x:"");
20     }
21

```

Figure 40:6.6 Source code(1)



```

21
22     int[][] b;
23     b = new int[20][20];
24     System.out.println(x:"Enter matrix B: ");
25
26     for(int i = 0; i < n; i++){
27         for(int j = 0; j < m; j++){
28             b[i][j] = keyboard.nextInt();
29         }
30         System.out.println(x:"");
31     }
32
33     int[][] c;
34     c = new int[20][20];
35     System.out.println(x:"A + B = ");
36     for(int i = 0; i < n; i++){
37         for(int j = 0; j < m; j++){
38             c[i][j] = a[i][j] + b[i][j];
39             System.out.printf(c[i][j] + " ");
40         }
41         System.out.printf(format:"\n");
42     }
43
44     keyboard.close();
45 }
46

```

Figure 41:6.6 Source code(2)

Kết quả

```
Enter the size of matrix (n x m):  
3  
4  
Enter matrix A:  
1  
2  
3  
4  
  
5  
6  
7  
8  
  
9  
10  
11  
12  
  
Enter matrix B:  
2  
3  
4  
5  
  
6  
7  
8  
9  
  
10  
11  
12  
13
```

Figure 42:6.6 Result(1)

```
A + B =  
3 5 7 9  
11 13 15 17  
19 21 23 25
```

Figure 43:6.6 Result(2)