**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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Hà Nội 9/2024

# Contents

# BÁO CÁO THỰC HÀNH LAB 01

## 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
}
```

*Figure 1:2.1 Source code*

### *Kết quả*

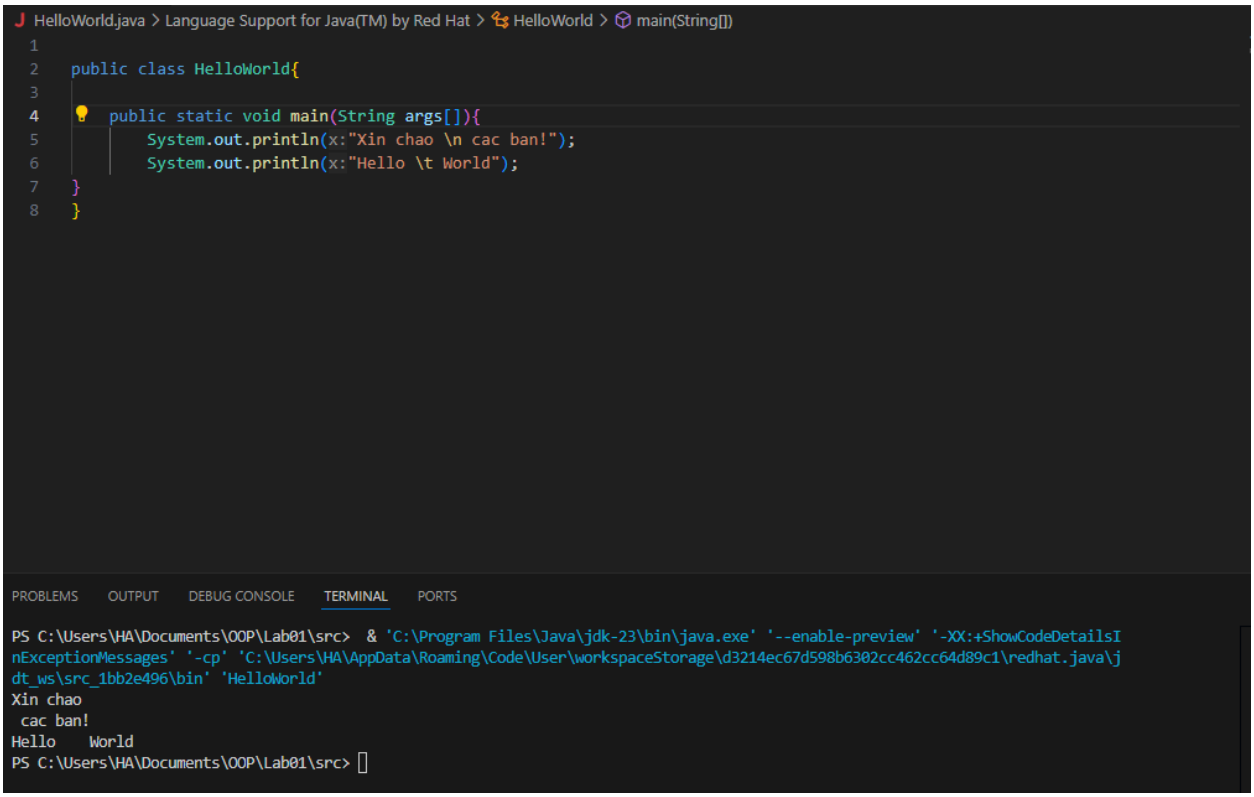



*Figure 2:2.1 Result*

## 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);
    }
}
```

*Figure 3:2.2 Source code*

## *Kết quả*

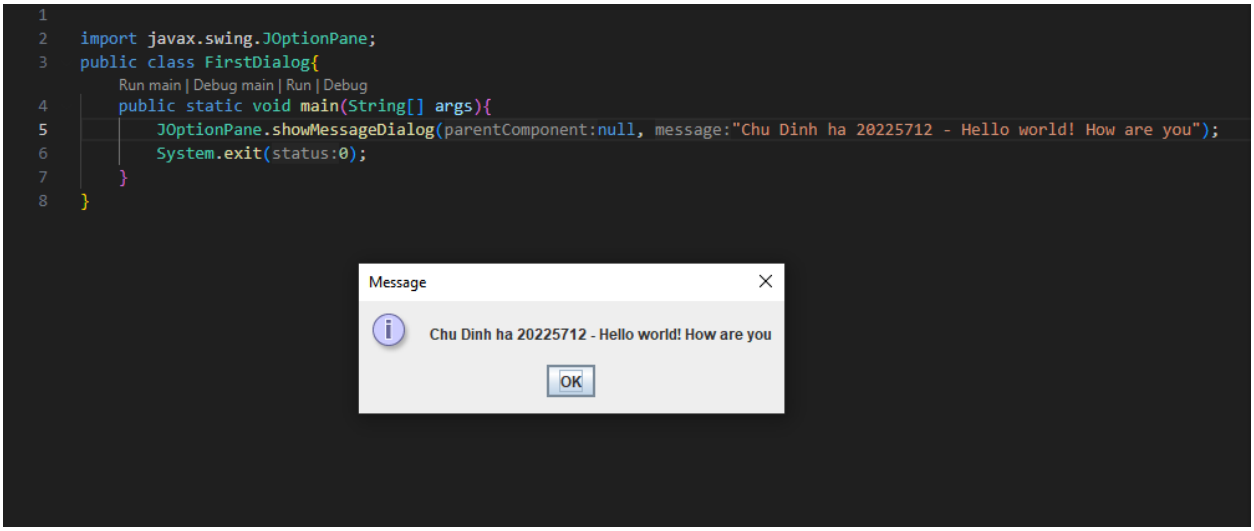



*Figure 4:2.2 Result*

## 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);
  }
}
```

*Figure 5:2.3 Source code*

## *Kết quả*

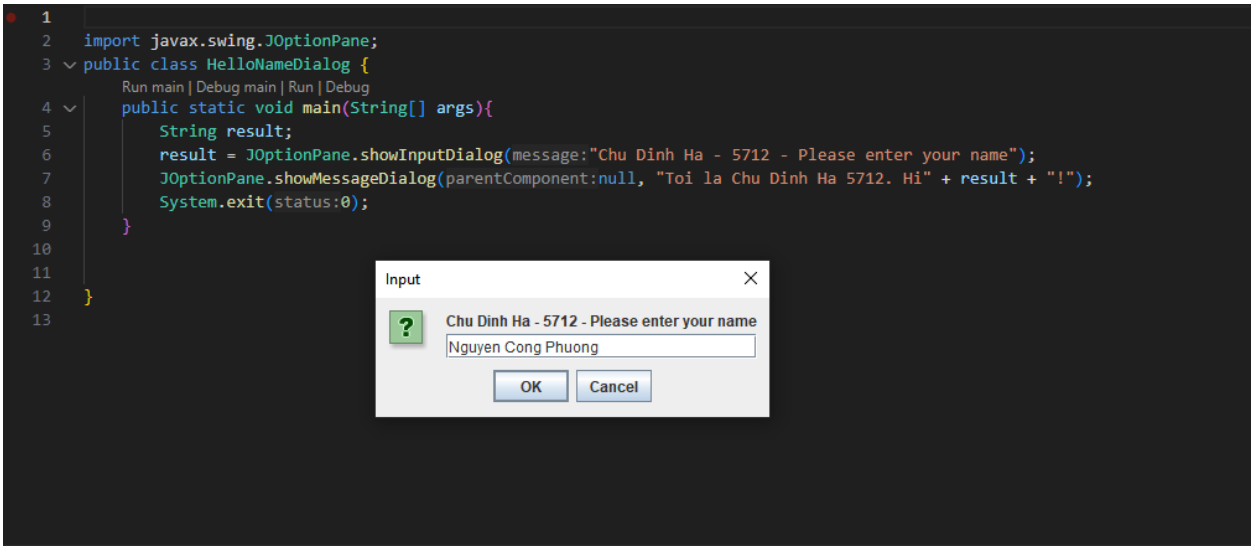



*Figure 6:2.3 Result(1)*

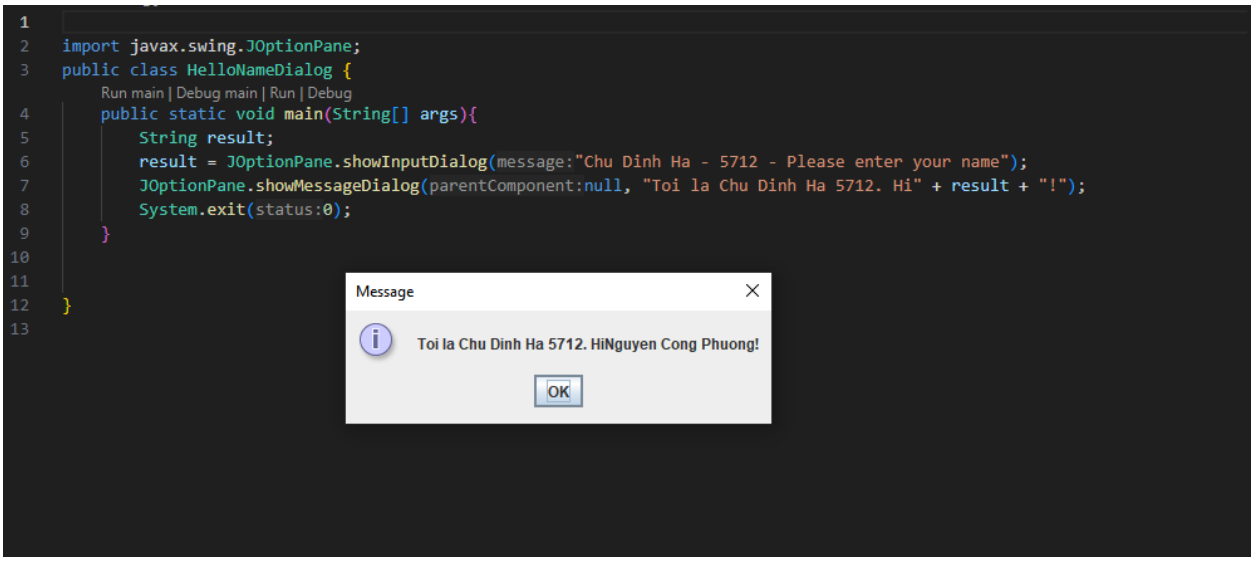



*Figure 7:2.3 Result(2)*

## 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);
  }
}
```

*Figure 8:2.4 Source code*

## *Kết quả*

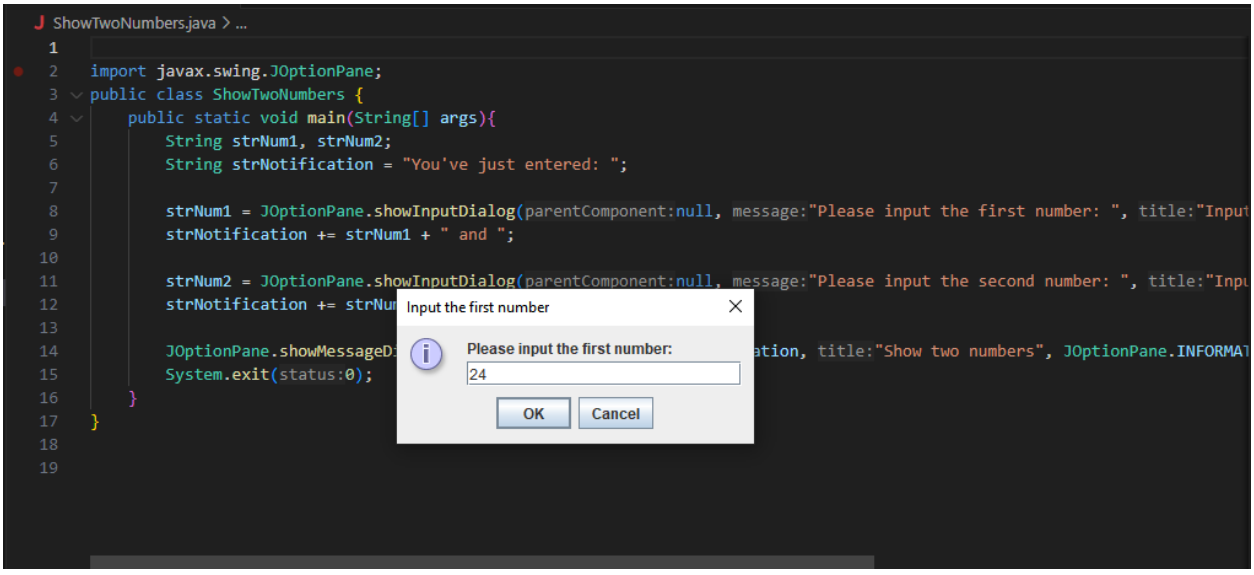



*Figure 9: 2.4 Result(1)*

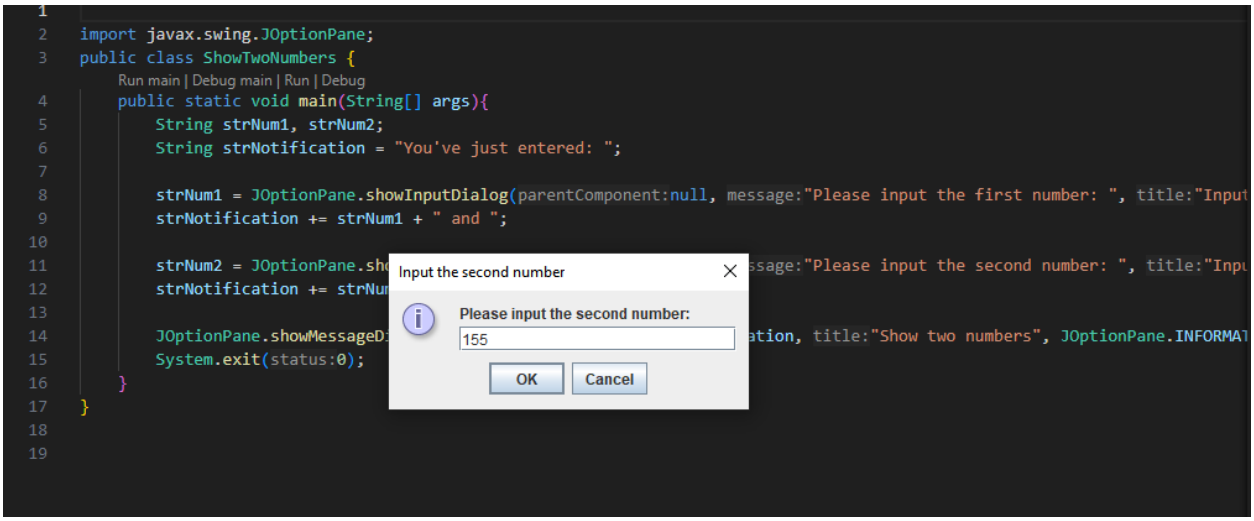



*Figure 10:2.4 Result(2)*


*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.

Math2numbers.java > ...

```java
import javax.swing.JOptionPane;
public class Math2numbers {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        String strNum1, strNum2;

        strNum1 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Dinh Ha - 5712 - Please input the first numb

        strNum2 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Dinh Ha - 5712 - Please input the second nu

        double num1 = Double.parseDouble(strNum1);
        double num2 = Double.parseDouble(strNum2);

        System.out.println(x:"Sum: ");
        System.out.println(num1 + num2);
        System.out.println(x:"Difference: ");
        System.out.println(num1 - num2);
        System.out.println(x:"Product: ");
        System.out.println(num1 * num2);
        System.out.println(x:"Division:");
        System.out.println(num1 / num2);
        System.out.println(num2 / num1);

        System.exit(status:0);
    }
}
```

*Figure 12:2.5 Source code*

## *Kết quả*

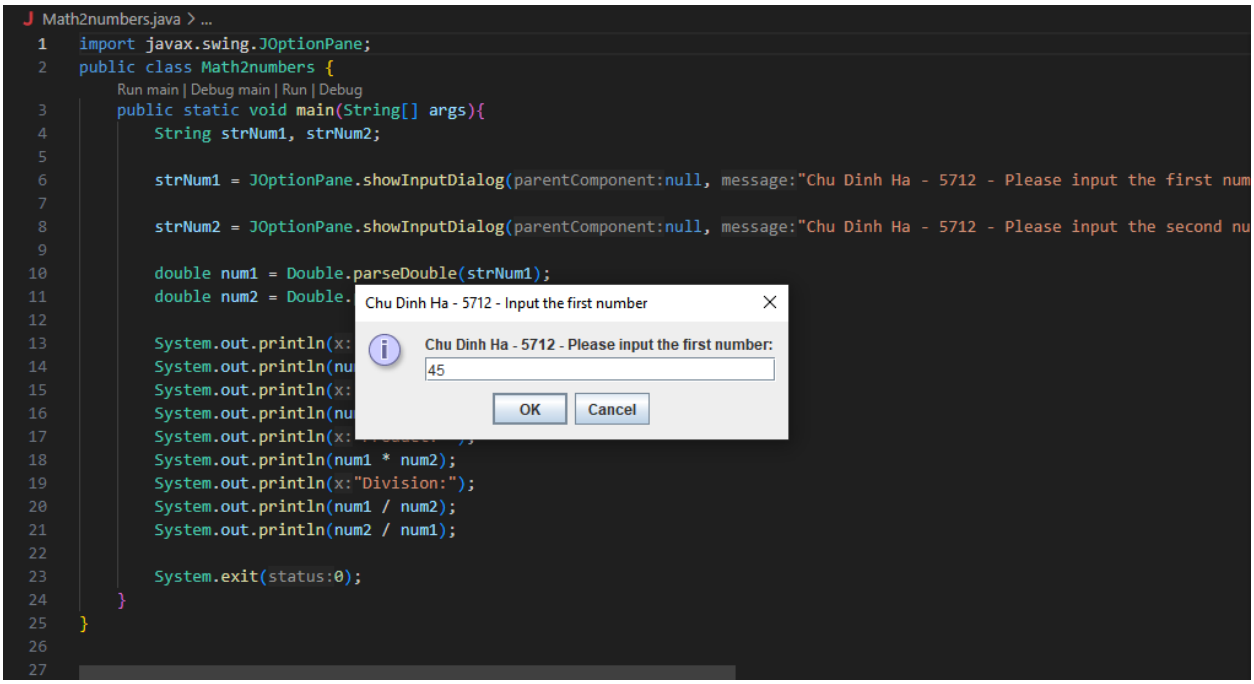



*Figure 13:2.5 Result(1)*

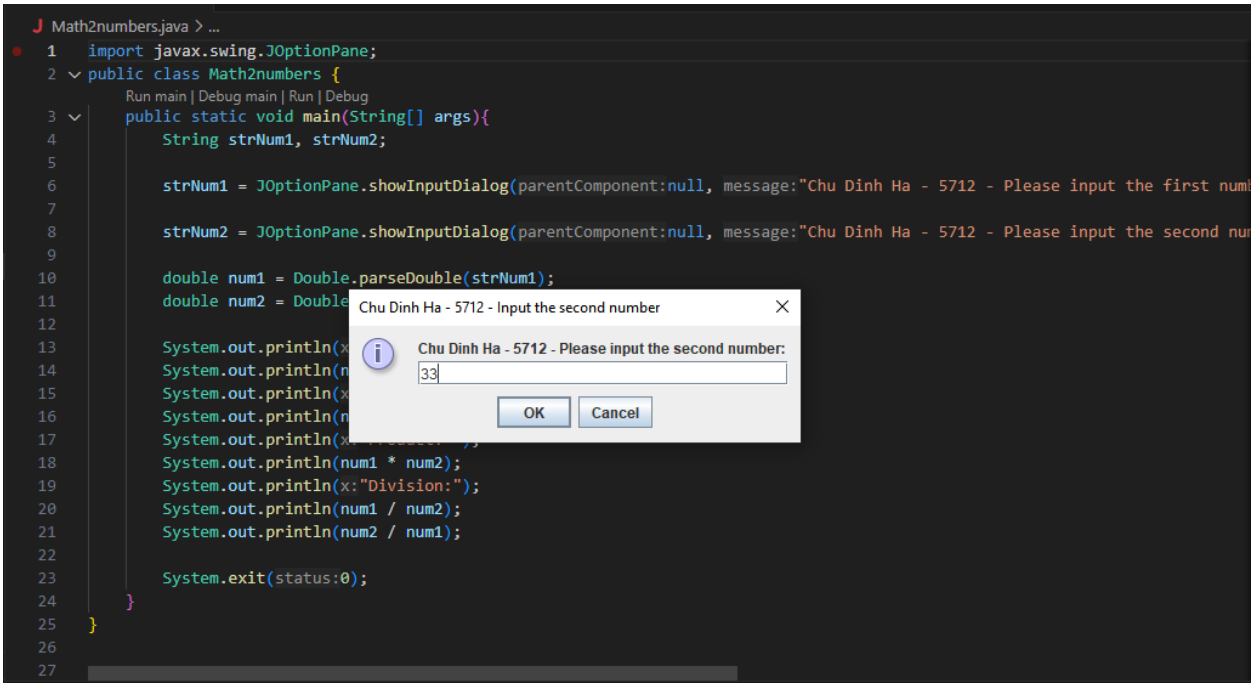
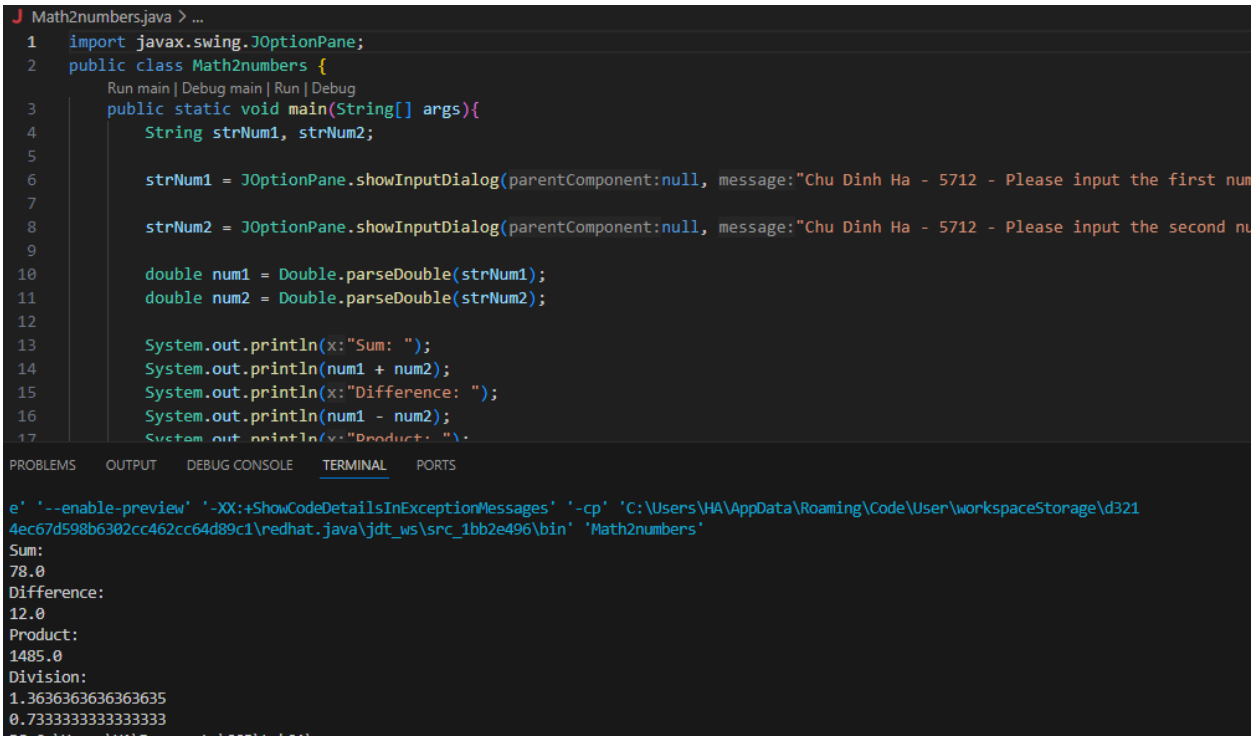



*Figure 14:2.5 Result(2)*



```
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 Dinh Ha - 5712 - Please input the first num
7
8           strNum2 = JOptionPane.showInputDialog(parentComponent:null, message:"Chu Dinh Ha - 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

```java
import java.util.Scanner;
import java.lang.Math;
public class Equation {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);

        System.out.println(x:"Enter a: ");
        Double a = keyboard.nextDouble();

        System.out.println(x:"Enter b: ");
        Double b = keyboard.nextDouble();

        System.out.println("Equation: " + a +"x + " + b + " = 0");
        if(a == 0) {
            if(b == 0) {
                System.out.println(x:"Infinite solution");
            }else{
                System.out.println(x:"No solution");
            }
        }else{
            Double x = -b/a;
            System.out.println("Solution: x= " + x);
        }

```

*Figure 16:2.6 Source code(1)*

```java

        System.out.println(x:"Enter a1: ");
        Double a1 = keyboard.nextDouble();

        System.out.println(x:"Enter b1: ");
        Double b1 = keyboard.nextDouble();

        System.out.println(x:"Enter c1: ");
        Double c1 = keyboard.nextDouble();

        System.out.println(x:"Enter a2: ");
        Double a2 = keyboard.nextDouble();

        System.out.println(x:"Enter b2: ");
        Double b2 = keyboard.nextDouble();

        System.out.println(x:"Enter c2: ");
        Double c2 = keyboard.nextDouble();

        System.out.println(x:"Equation: " );
        System.out.println(a1 +"x + " + b1 + "y = " + c1);
        System.out.println(a2 +"x + " + b2 + "y = " + c2);

        Double d = a1*b2 - a2*b1;
        Double d1 = c1*b2 - c2*b1;
        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*

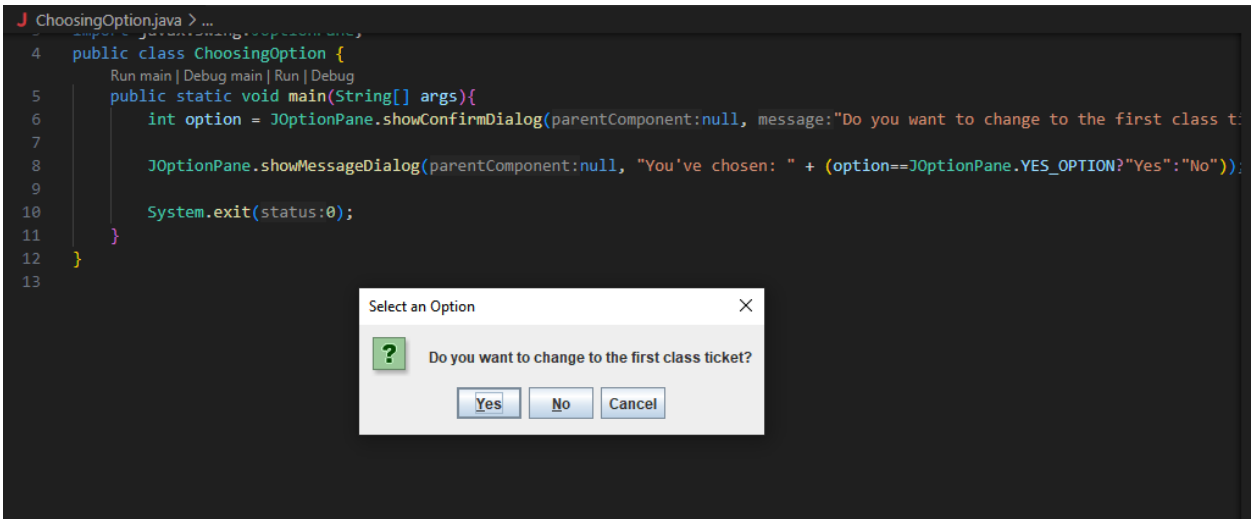



*Figure 22:6.1 Result(1)*

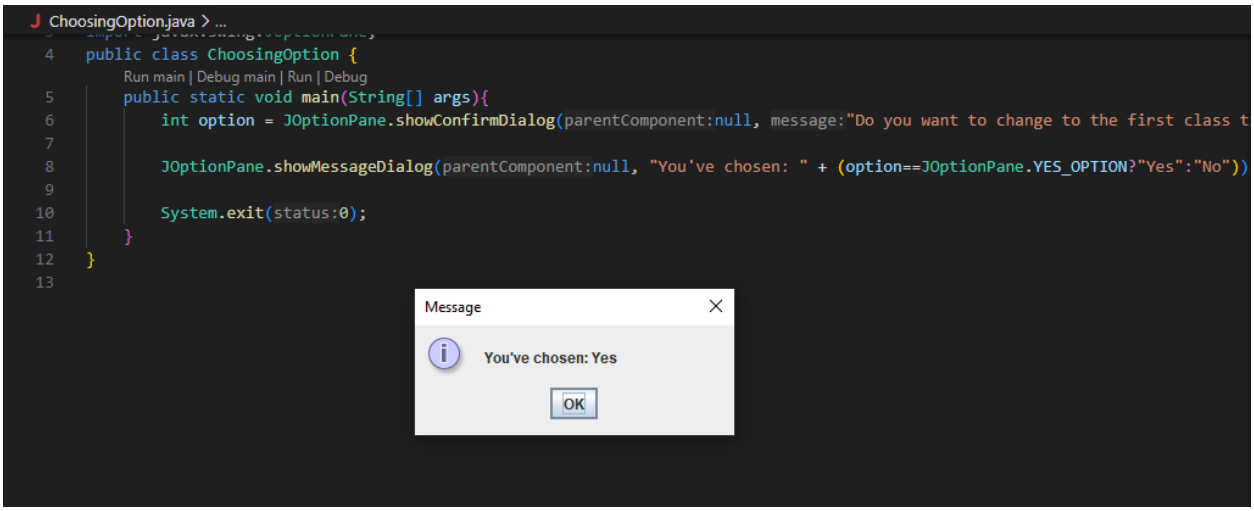



*Figure 23:6.1 Result(2)*

## 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 | Searc

```
<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*

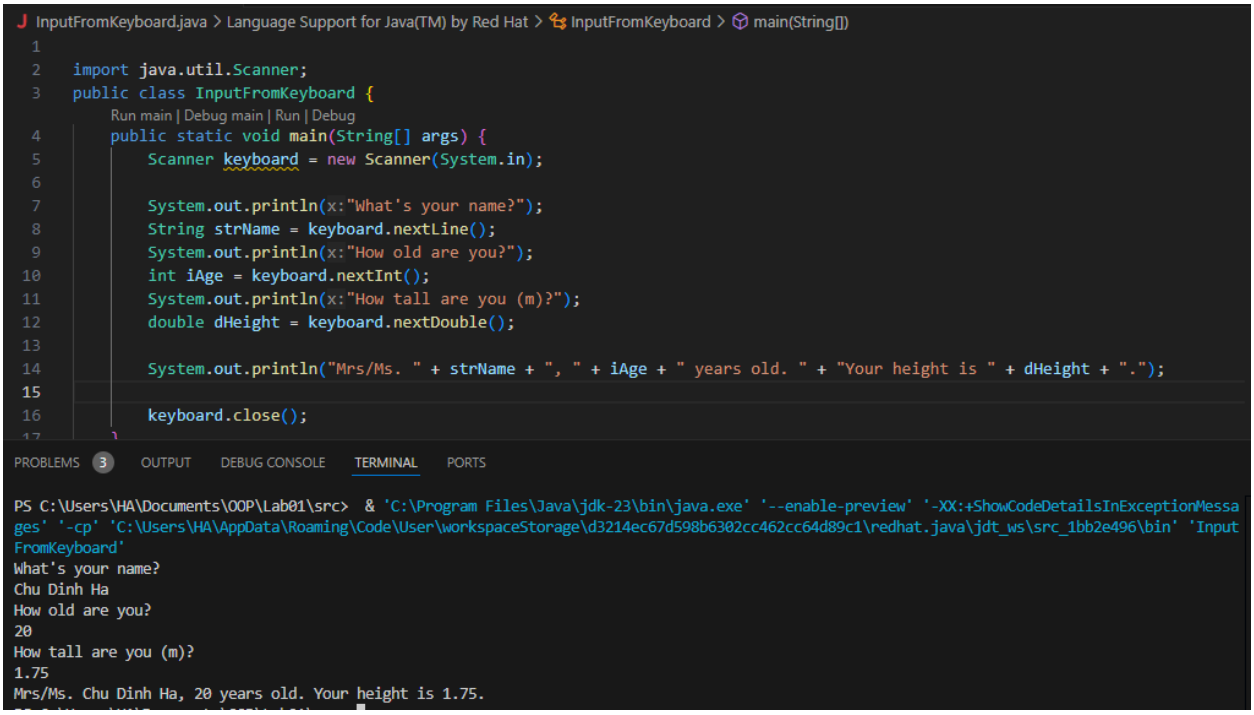



*Figure 25:6.2 Result*

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

**E.g. n=5:**

```
    *
   ***
  *****
 *******
*********
```

```java

import java.util.Scanner;

public class Starheight {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        System.out.println(x:"Enter the value of n: ");

        int n = keyboard.nextInt();
        System.out.println("The triangle's height is: " + n);

        for(int i = 1; i <= n; i++){
            for(int x = 1; x <= n - i; x++){
                System.out.printf(format:" ");
            }
            for(int j = 1; j <= 2*i-1; j++){
                System.out.printf(format:"*");
            }
            System.out.println(x:"");
        }

        keyboard.close();
    }
}

```

*Figure 26:6.3 Source code*

*Kết quả*

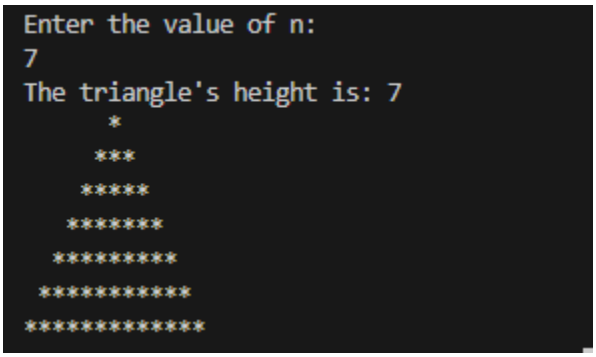



*Figure 27:6.3 Result*

## 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 |

```
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":
```

*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)*

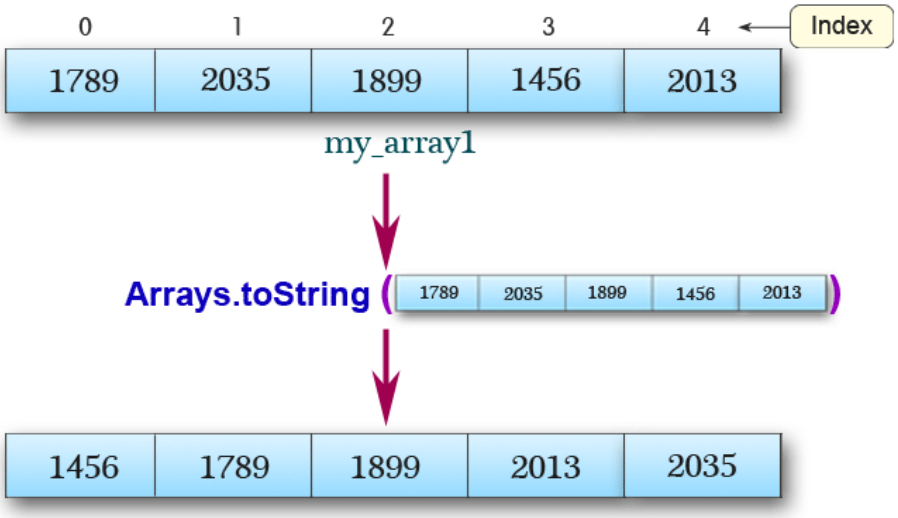
```
Enter the month: 2
Enter the year: 1800
Days of the month: 28
```

*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.




```java
import java.util.Scanner;
public class ArraySortSumAvg {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner keyboard = new Scanner(System.in);

        int[] arr = new int[30];
        System.out.println(x:"Enter array's length: ");
        int n = keyboard.nextInt();

        int sum = 0;
        System.out.println(x:"Enter array");
        for(int i = 0; i < n; i++){
            arr[i] = keyboard.nextInt();
            sum += arr[i];
        }

        double avg = sum/arr.length;
        for(int i = 0; i < n - 1; i++){
            for(int j = 0; j < n - i - 1; j++){
                if(arr[j] > arr[j + 1]){
                    int tmp = arr[j];
                    arr[j] = arr[j + 1];
                    arr[j + 1] = tmp;
                }
            }
        }
```

*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              System.out.printf(arr[i] + " ");
31          System.out.println(x:"");
32          System.out.println("Sum of array: " + sum);
33          System.out.println("Average value: " + avg);
34
35          keyboard.close();
36      }
37  }
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[])

```java
import java.util.Scanner;
public class TwoMatrices {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        Scanner keyboard = new Scanner(System.in);
        System.out.println(x:"Enter the size of matrix (n x m): ");

        int n = keyboard.nextInt();
        int m = keyboard.nextInt();

        int[][] a;
        a = new int[20][20];

        System.out.println(x:"Enter matrix A: ");
        for(int i = 0; i < n; i++){
            for(int j = 0; j < m; j++){
                a[i][j]= keyboard.nextInt();

            }
            System.out.println(x:"");
        }
```

*Figure 40:6.6 Source code(1)*

```java
        int[][] b;
        b = new int[20][20];
        System.out.println(x:"Enter matrix B: ");

        for(int i = 0; i < n; i++){
            for(int j = 0; j < m; j++){
                b[i][j] = keyboard.nextInt();
            }
            System.out.println(x:"");
        }

        int[][] c;
        c = new int[20][20];
        System.out.println(x:"A + B = ");
        for(int i = 0; i < n; i++){
            for(int j = 0; j < m; j++){
                c[i][j] = a[i][j] + b[i][j];
                System.out.printf(c[i][j] + " ");
            }
            System.out.printf(format:"\n");
        }

        keyboard.close();
    }
}
```

*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)*