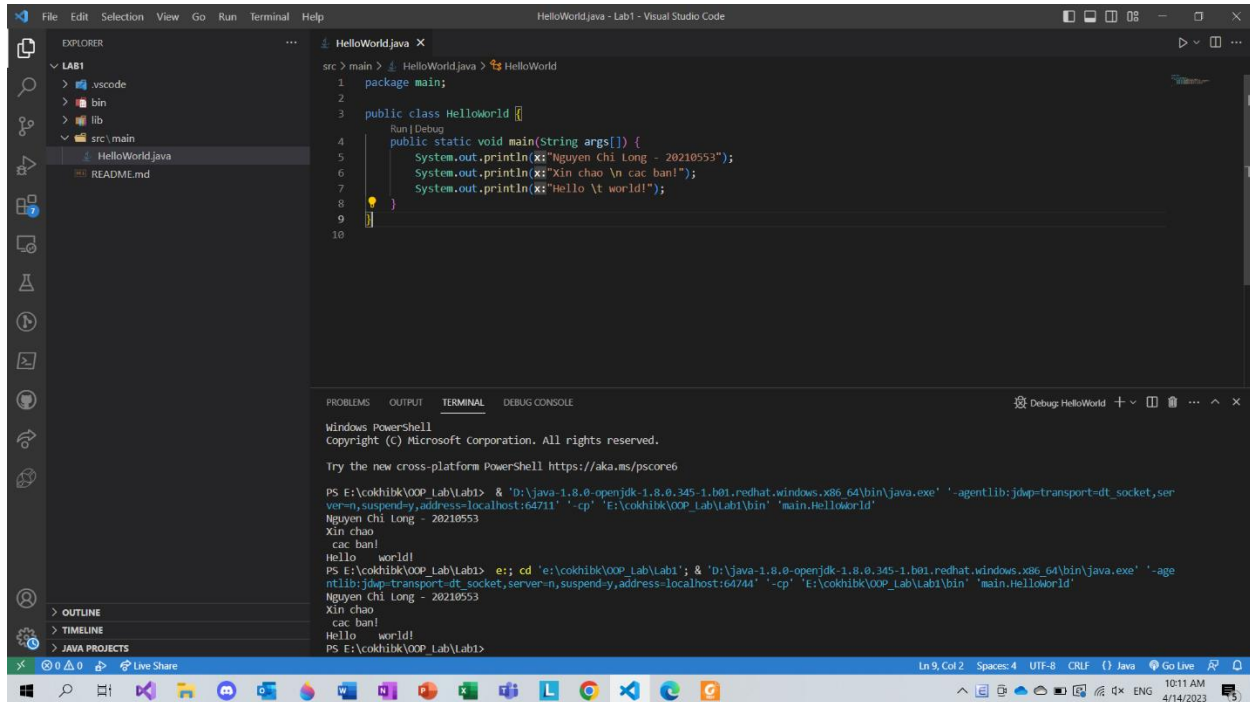


BÁO CÁO THỰC HÀNH LAB 1

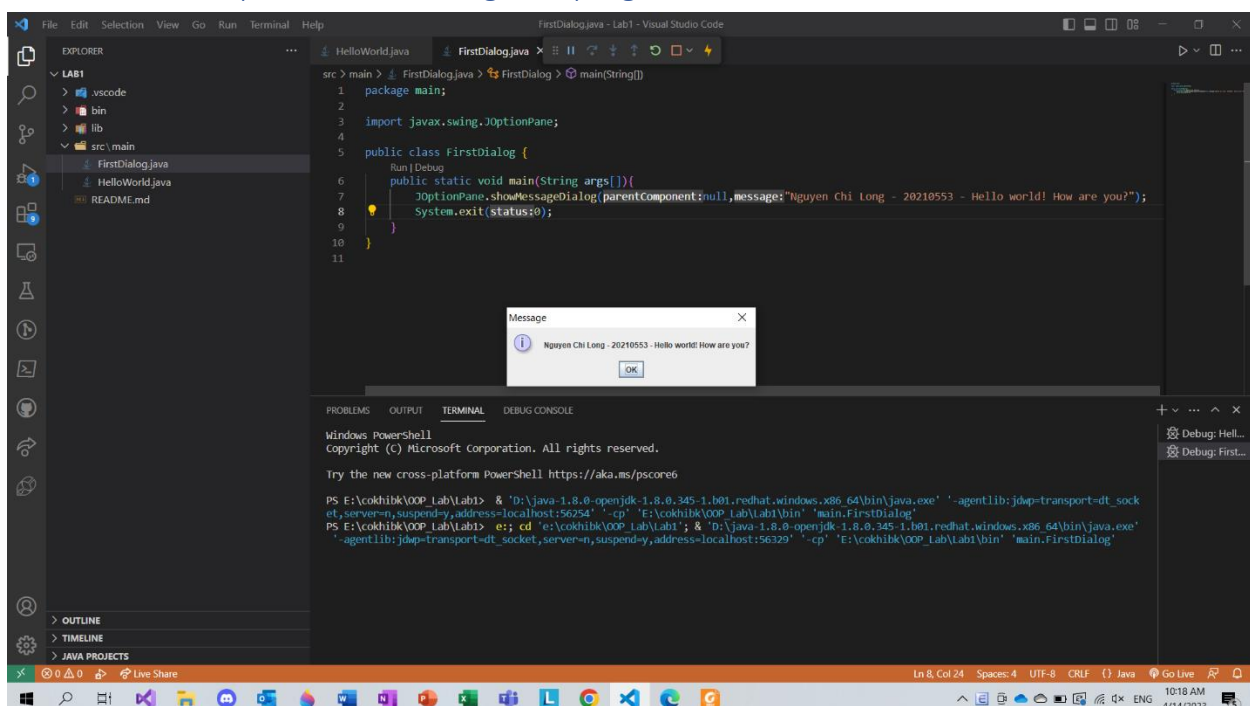
LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

The Very First Java Programs

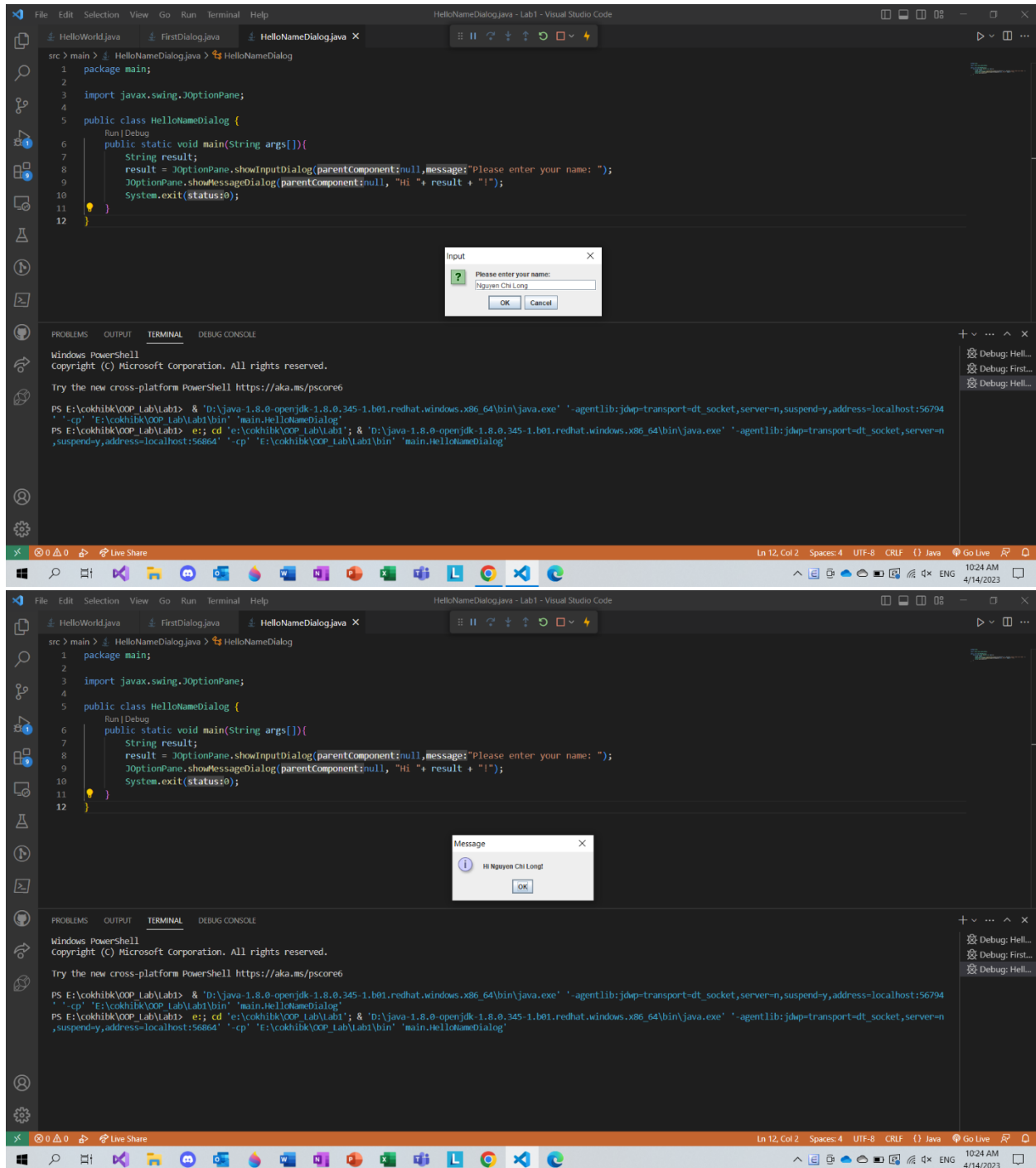
2.2.1 Write, compile the first Java application:



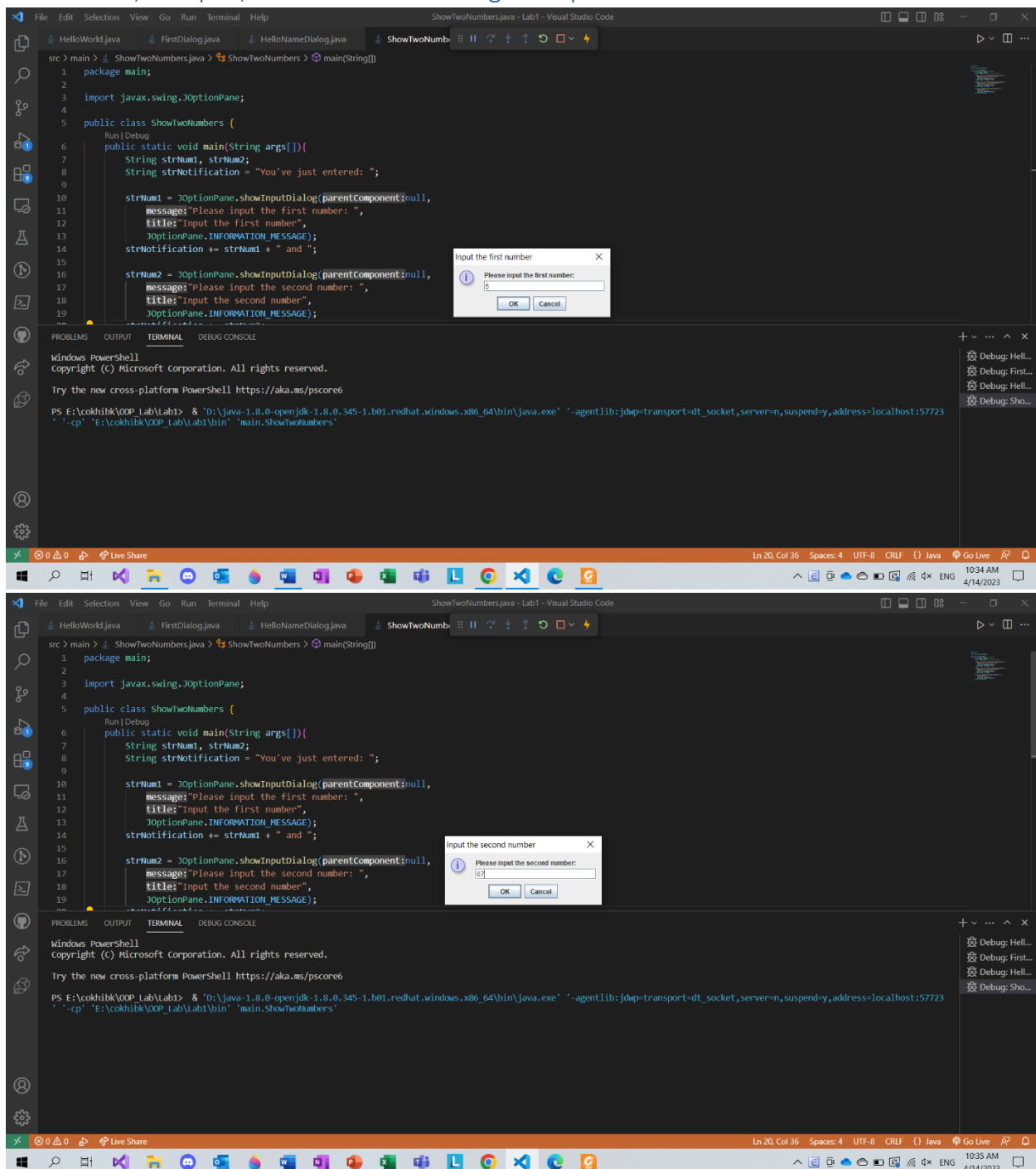
2.2.2 Write, compile the first dialog Java program

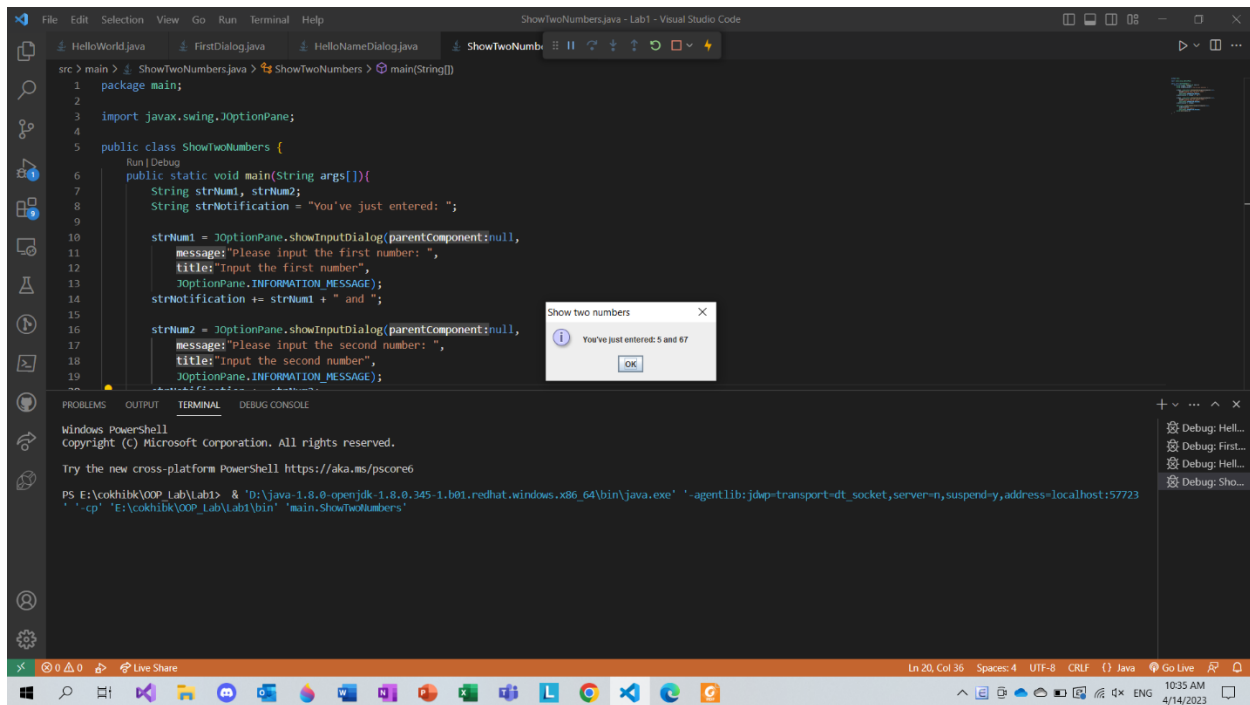


2.2.3 Write, compile the first input dialog Java application



2.2.4 Write, compile, and run the following example:





The screenshot shows the Visual Studio Code editor with a Java file named `ShowTwoNumbers.java`. The code is as follows:

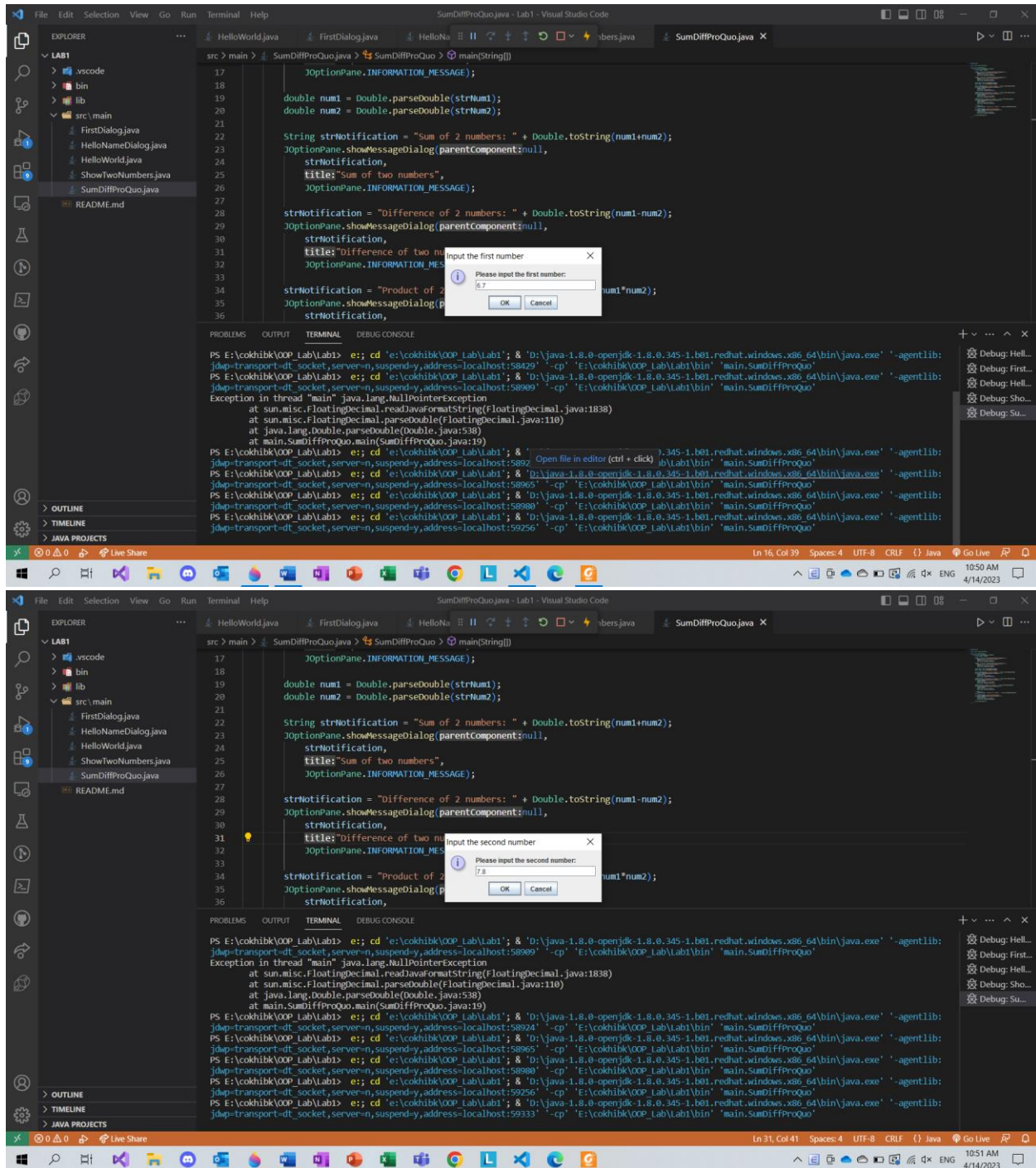
```
src > main > ShowTwoNumbers.java > ShowTwoNumbers > main(String[] args)
1 package main;
2
3 import javax.swing.JOptionPane;
4
5 public class ShowTwoNumbers {
6     public static void main(String args[]){
7         String strNum1, strNum2;
8         String strNotification = "You've just entered: ";
9
10        strNum1 = JOptionPane.showInputDialog(parentComponent:null,
11            message:"Please input the first number: ",
12            title:"Input the first number",
13            JOptionPane.INFORMATION_MESSAGE);
14        strNotification += strNum1 + " and ";
15
16        strNum2 = JOptionPane.showInputDialog(parentComponent:null,
17            message:"Please input the second number: ",
18            title:"Input the second number",
19            JOptionPane.INFORMATION_MESSAGE);
20    }
```

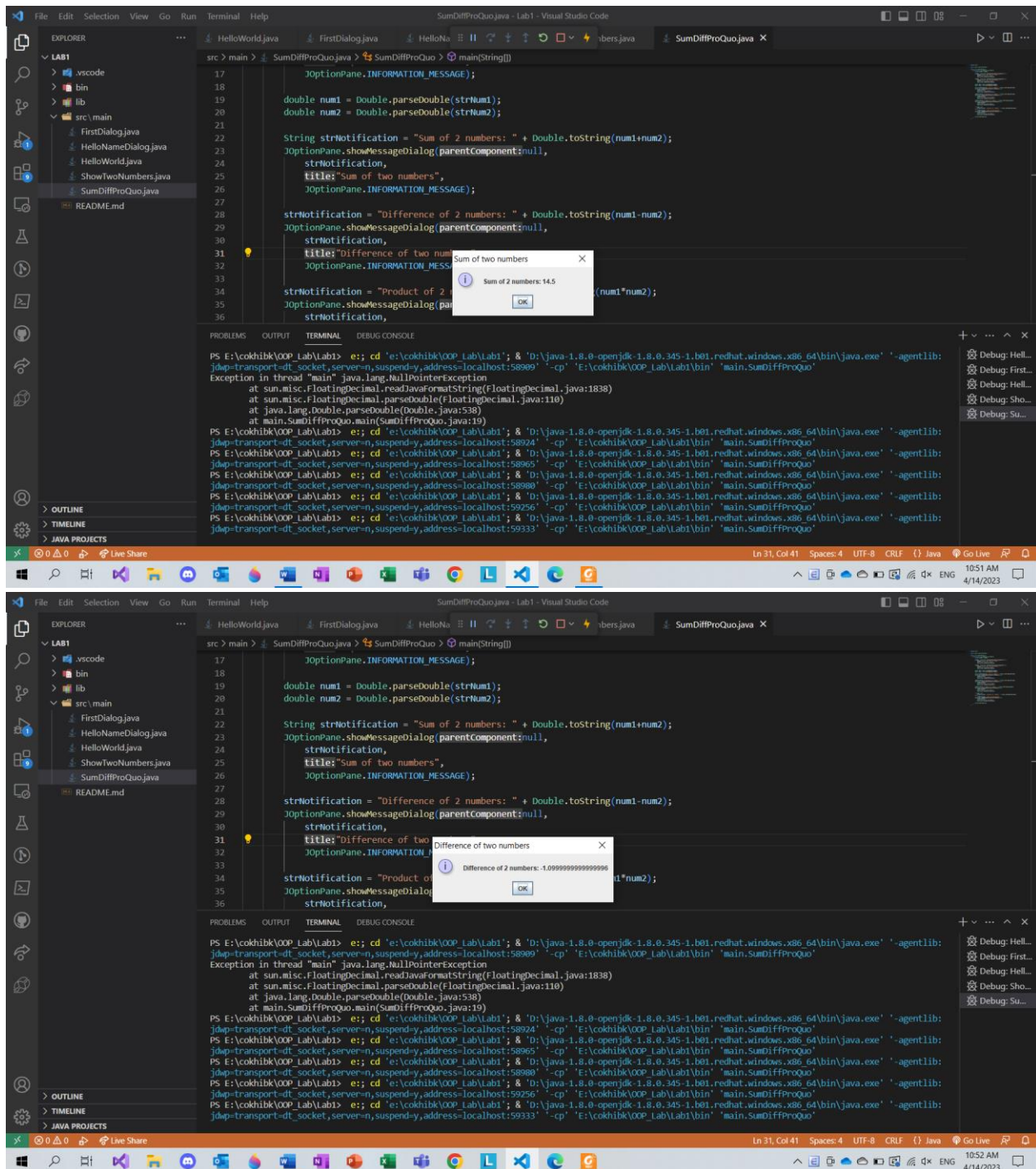
A dialog box titled "Show two numbers" is displayed, showing the message "You've just entered: 5 and 67" with an "OK" button.

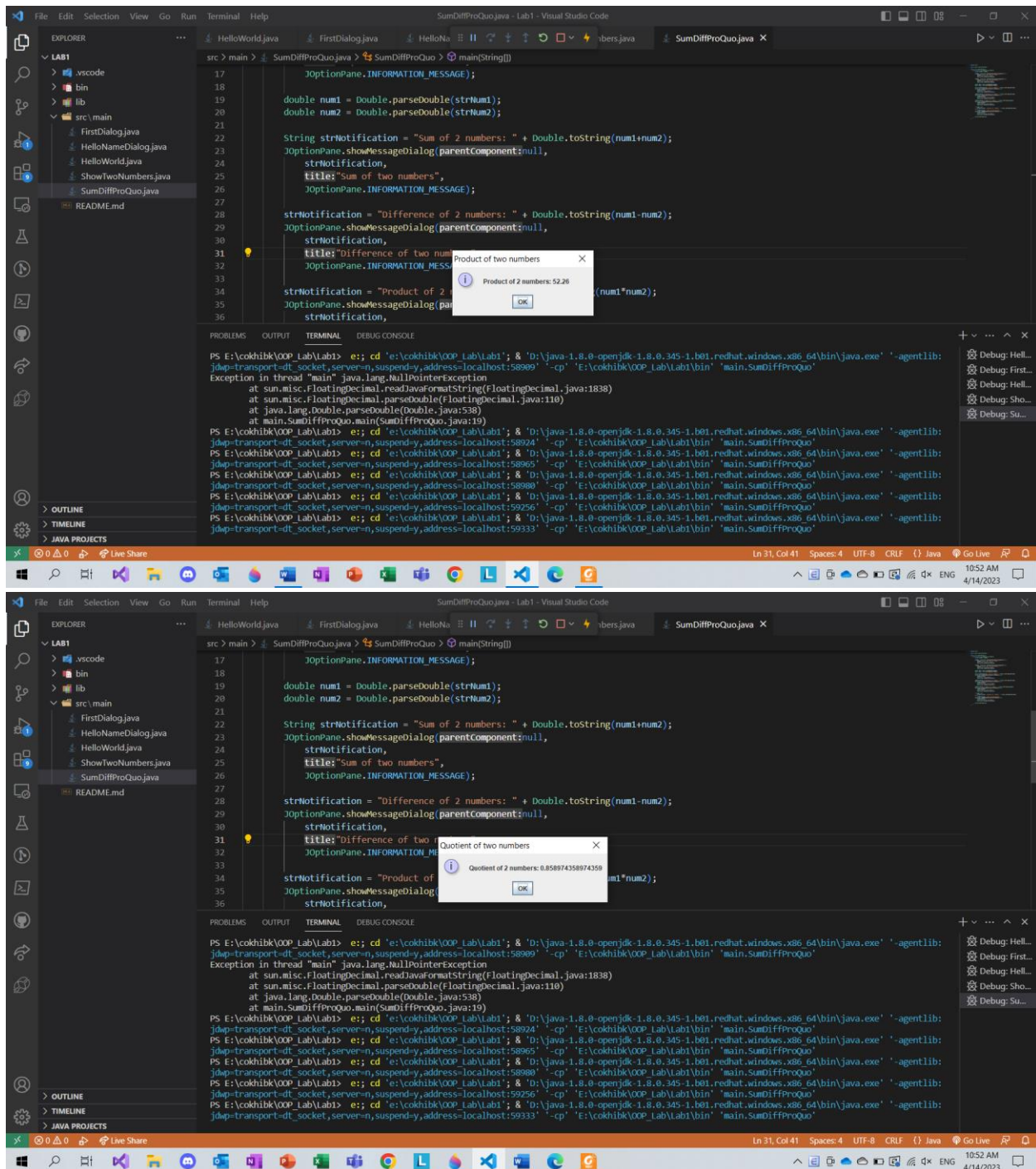
The terminal window at the bottom shows the command used to run the program:

```
PS E:\cokhibk\OOP_Lab1> & "D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe" "-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:57723"
"-cp" "E:\cokhibk\OOP_Lab1\bin" "main.ShowTwoNumbers"
```

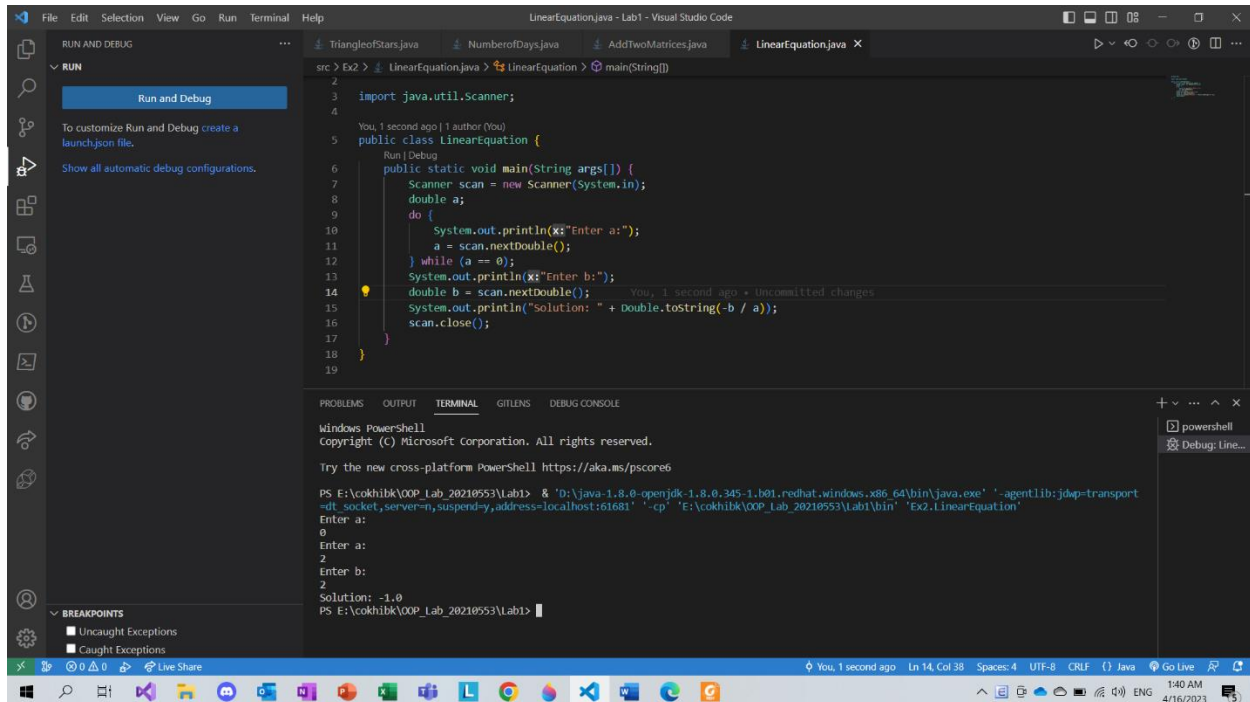
2.2.5 Write a program to calculate sum, difference, product, and quotient of 2 double numbers which are entered by users.







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.



```

src > Ex2 > LinearEquation.java > LinearEquation > main(String[])
2
3 import java.util.Scanner;
4
5 You, 1 second ago | 1 author (you)
6 public class LinearEquation {
7     Run | Debug
8     public static void main(String args[]) {
9         Scanner scan = new Scanner(System.in);
10        double a;
11        do {
12            System.out.println("Enter a:");
13            a = scan.nextDouble();
14        } while (a == 0);
15        System.out.println("Enter b:");
16        double b = scan.nextDouble();
17        System.out.println("Solution: " + Double.toString(-b / a));
18        scan.close();
19    }
20 }

```

PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE

Windows PowerShell
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```

PS E:\cokhibk\OOP_Lab_20210553\Lab1> & 'D:\java-1.8.0-openjdk-1.8.0-345-1-b01\redhat.windows.s86_64\bin\java.exe' -agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:61681 -cp 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex2.LinearEquation'
Enter a:
0
Enter a:
2
Enter b:
2
Solution: -1.0
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

1:40 AM
4/16/2023

The first screenshot shows the `LinearSystem.java` file. The code prompts the user to enter coefficients a_{11} , a_{12} , a_{21} , and a_{22} . It then calculates the determinant $\Delta = a_{11}a_{22} - a_{12}a_{21}$. If $\Delta = 0$, it prints a message that the system has no unique solution. Otherwise, it calculates the solutions $x_1 = \frac{b_1a_{22} - b_2a_{12}}{\Delta}$ and $x_2 = \frac{b_2a_{11} - b_1a_{21}}{\Delta}$.

```

15 double a21 = scan.nextDouble();
16 System.out.println("Enter a21:");
17 double a22 = scan.nextDouble();
18 System.out.println("Enter a22:");
19 double b2 = scan.nextDouble();
20
21 double detA = a11*a22 - a12*a21;
22 if (detA == 0) {
23     System.out.println("The coefficient matrix A is singular, so the system has no unique solution.");
24     scan.close();
25     return;
26 }
27 double det1 = b1*a22 - b2*a12;
28 double det2 = a11*b2 - a21*b1;
29 // Print the solution
30 System.out.println("The solution is x1 = " + det1/detA + ", x2 = " + det2/detA);
31 scan.close();
32 }
33
34

```

The terminal output shows the execution of the program with the following input and output:

```

PS E:\cokhibk\OOP_Lab_20210553\Lab1> & 'D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe' '-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:62566' '-cp' 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex2.LinearSystem'
Enter a11:
3.632
Enter a12:
5.734
Enter b1:
8.412
Enter a21:
2.5348
Enter a22:
-7.5312
Enter b2:
4.1022
The solution is x1 = 2.0821985408510922, x2 = 0.14814857963529943
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

The second screenshot shows the `QuadraticFunction.java` file. The code prompts the user to enter coefficients a , b , and c . It then calculates the discriminant $\Delta = b^2 - 4ac$. If $\Delta < 0$, it prints a message that the equation has no real roots. If $\Delta = 0$, it prints a message that the equation has a double real root. If $\Delta > 0$, it prints a message that the equation has two real roots and calculates them using the quadratic formula.

```

13 }
14
15 System.out.println("Enter b:");
16 double b = scan.nextDouble();
17 System.out.println("Enter c:");
18 double c = scan.nextDouble();
19 scan.close();
20 double delta = b * b - 4 * a * c;
21 if (delta < 0) {
22     System.out.println("The equation has no real roots.");
23 } else if (delta == 0) {
24     double x = -b / (2 * a);
25     System.out.println("The equation has a double real root: x = " + x);
26 } else {
27     double x1 = (-b + Math.sqrt(delta)) / (2 * a);
28     double x2 = (-b - Math.sqrt(delta)) / (2 * a);
29     System.out.println("The equation has two real roots: x1 = " + x1 + ", x2 = " + x2);
30 }
31
32

```

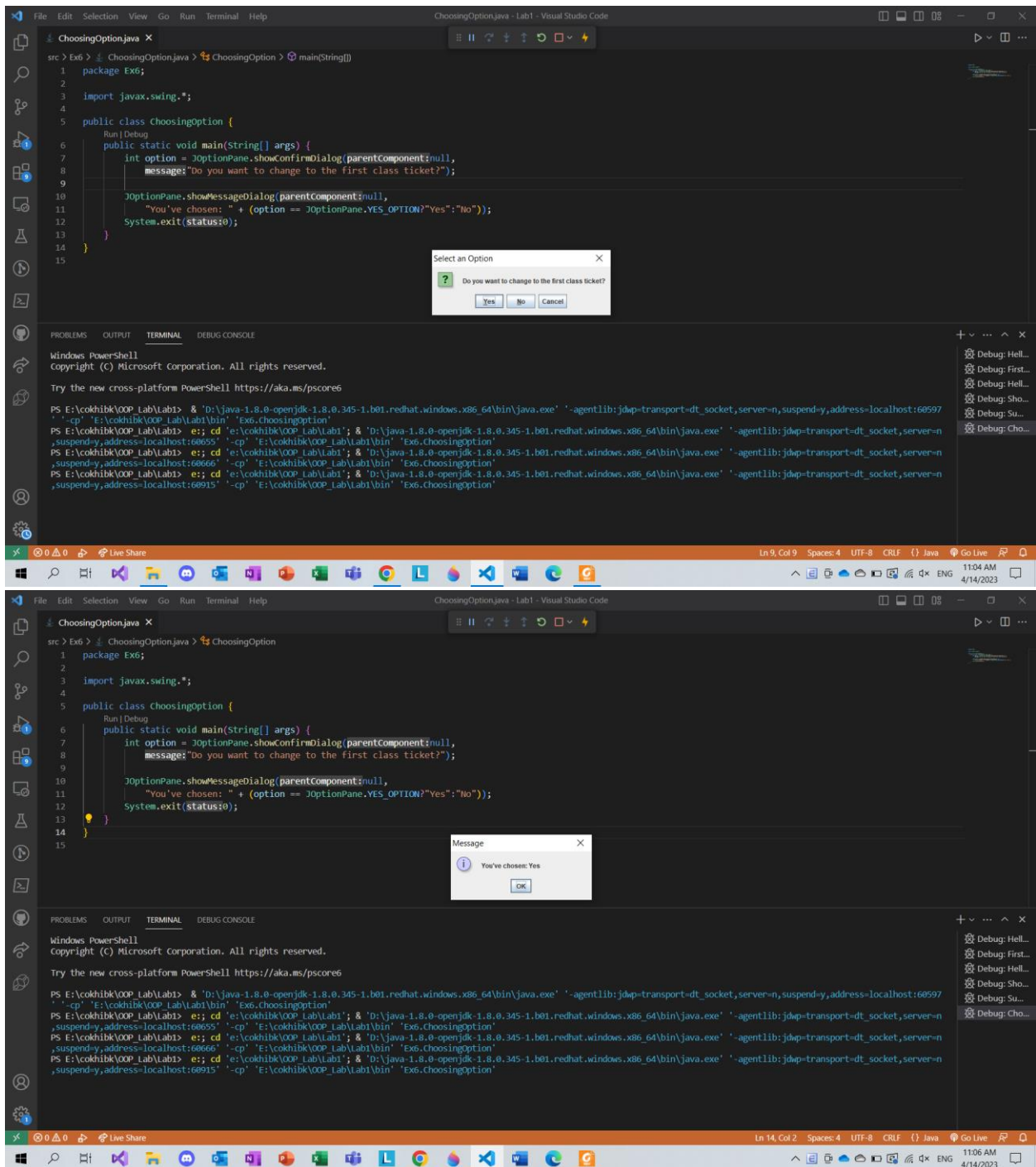
The terminal output shows the execution of the program with the following input and output:

```

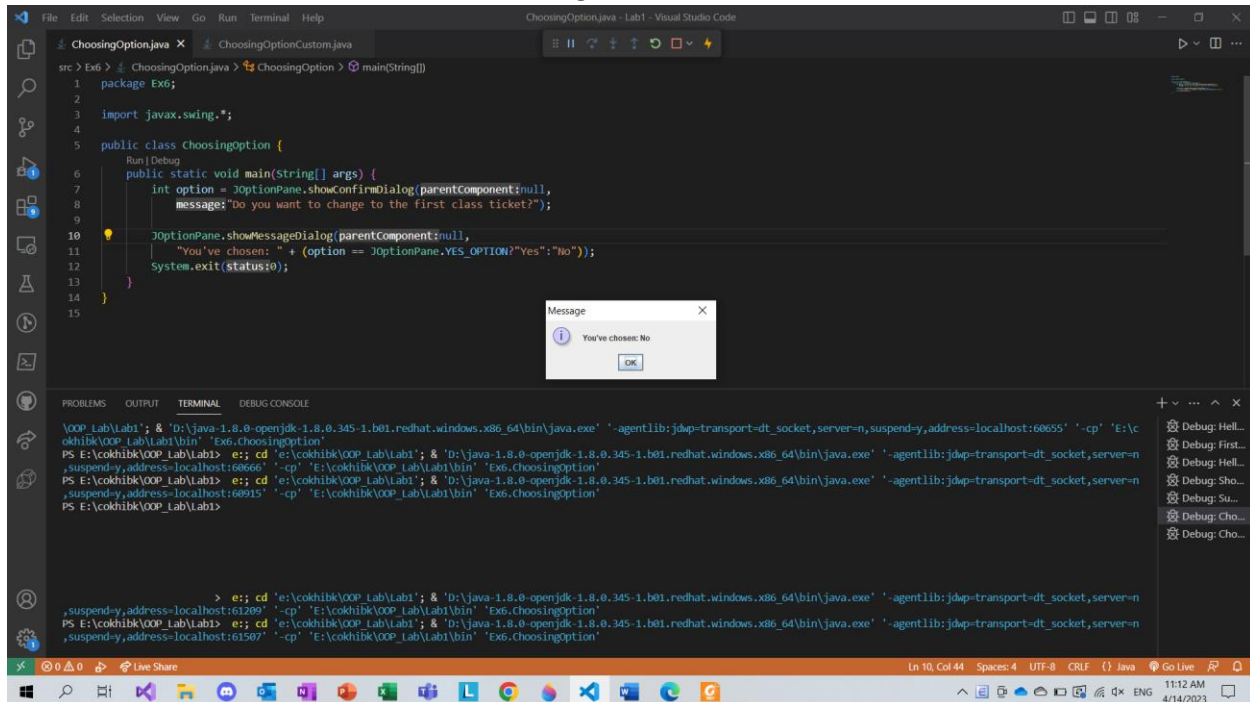
4
Enter c:
4
The equation has a double real root: x = -2.0
PS E:\cokhibk\OOP_Lab_20210553\Lab1> cd 'e:\cokhibk\OOP_Lab_20210553\Lab1' & 'D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe' '-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:63593' '-cp' 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex2.QuadraticFunction'
Enter a:
0
Error: a can't be equal to 0.
Enter a:
3
Enter b:
15
Enter c:
3
The equation has two real roots: x1 = -0.20871215252207995, x2 = -4.79128784747792
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

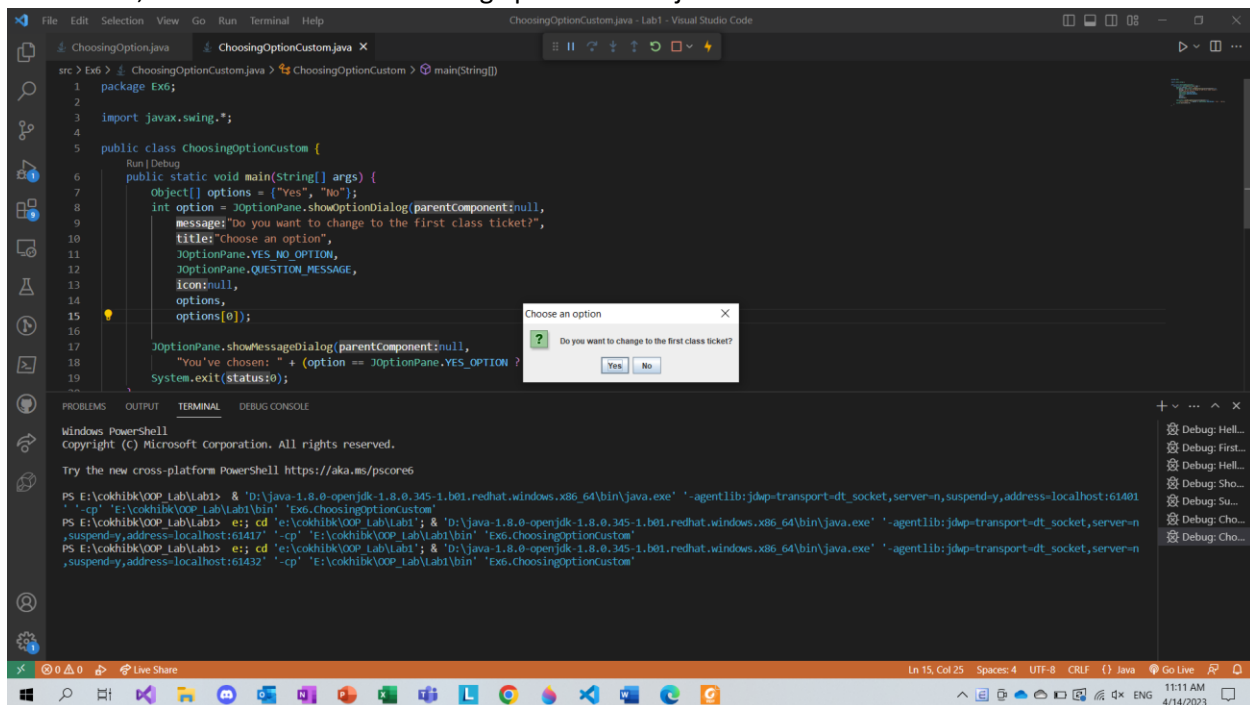
6.1 Write, compile and run the ChoosingOption program:



- If users choose “Cancel”, their choice are changed to “No”.



- To fix this, I built a new file `ChoosingOptionCustom.java`.



6.2. Write a program for input/output from keyboard

```

src > Ex6 > InputFromKeyboard.java > InputFromKeyboard > main(String[])
1 package Ex6;
2
3 import java.util.*;
4
5 public class InputFromKeyboard {
6     public static void main(String[] args) {
7         Scanner scan = new Scanner(System.in);
8         System.out.println("What's your name?");
9         String strName = scan.nextLine();
10        System.out.println("How old are you?");
11        int iAge = scan.nextInt();
12        System.out.println("How tall are you (m)?");
13        double dHeight = scan.nextDouble();
14        scan.close();
15
16        System.out.println("Mrs/Ms. " + strName + ", " + iAge + " years old. " + "Your height is " + dHeight + ".");
17    }
18 }
19
PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE
Windows PowerShell
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PS E:\cokhibk\OOP_Lab_20210553\Lab1> & 'D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe' -agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:64242 -cp 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex6.InputFromKeyboard'
What's your name?
Nguyen Chi Long
How old are you?
19
How tall are you (m)?
178
Mrs/Ms. Nguyen Chi Long, 19 years old. Your height is 178.0.
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

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

```

src > Ex6 > TriangleOfStars.java > TriangleOfStars
4
5 public class TriangleOfStars {
6     public static void main(String[] args) {
7         Scanner scan = new Scanner(System.in);
8         System.out.println("Enter n:");
9         int n = scan.nextInt();
10        for (int i = 1; i <= n; ++i) {
11            String s = "";
12            for (int j = n - i; j >= 1; --j) {
13                s += " ";
14            }
15            for (int j = 1; j <= 2 * i; ++j) {
16                s += "*";
17            }
18            System.out.println(s);
19        }
20        scan.close();
21    }
22 }
23
PROBLEMS OUTPUT TERMINAL GITLENS DEBUG CONSOLE
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\cokhibk\OOP_Lab_20210553\Lab1> & 'D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe' -agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:65110 -cp 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex6.TriangleOfStars'
Enter n:
6
*
***
*****
*****
*****
*****
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

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.

The screenshot shows the Visual Studio Code editor with the file `NumberofDays.java` open. The code is as follows:

```

1  import java.util.*;
2
3  public class NumberofDays {
4
5      public static void main(String[] args) {
6          Scanner input = new Scanner(System.in);
7          int year, month, days;
8
9          do {
10             System.out.println("Enter the year (non-negative integer): ");
11             year = input.nextInt();
12             } while (year < 0);
13
14             String monthStr = input.nextLine();
15             month = 0;
16             while (month == 0) {
17                 System.out.println("Enter the month (Valid inputs: January, Jan., Jan, or 1): ");
18                 monthStr = input.nextLine();
19                 monthStr = monthStr.toLowerCase();
20                 switch (monthStr) {
21

```

The terminal output shows the program running successfully with the following input and output:

```

PS E:\cokhibk\OOP_Lab_20210553\Lab1> cd 'E:\cokhibk\OOP_Lab_20210553\Lab1' & 'D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe'
-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:54457' -cp 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex6.NumberofDays'
Enter the year (non-negative integer):
2032
Enter the month (Valid inputs: January, Jan., Jan, or 1):
Feb
Enter the month (Valid inputs: January, Jan., Jan, or 1):
Feb
The month 2/2032 has 29 days.
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

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

The screenshot shows the Visual Studio Code editor with the file `SortArrayandCalculateMean.java` open. The code is as follows:

```

1  package Ex6;
2
3  import java.util.Arrays;
4  import java.util.Scanner;
5
6  public class SortArrayandCalculateMean {
7
8      public static void main(String[] args) {
9          Scanner scan = new Scanner(System.in);
10         System.out.println("Enter the size of the array: ");
11         int sz = scan.nextInt();
12         int[] arr = new int[sz];
13         System.out.println("Enter the values of the array:");
14         for (int i = 0; i < sz; i++) {
15             arr[i] = scan.nextInt();
16         }
17         Arrays.sort(arr);
18         int sum = 0;
19         for (int i = 0; i < sz; i++) {
20             sum += arr[i];
21         }
22         double avg = (double) sum / sz;
23         System.out.println("The sorted array is: " + Arrays.toString(arr));
24         System.out.println("The sum of the array elements is: " + sum);
25         System.out.println("The average of the array elements is: " + avg);
26     }
27 }

```

The terminal output shows the program running successfully with the following input and output:

```

PS E:\cokhibk\OOP_Lab_20210553\Lab1> cd 'E:\cokhibk\OOP_Lab_20210553\Lab1' & 'D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe'
-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:54667' -cp 'E:\cokhibk\OOP_Lab_20210553\Lab1\bin' 'Ex6.SortArrayandCalculateMean'
Enter the size of the array:
5
Enter the values of the array:
36 48 6 72 15
The sorted array is: [6, 15, 36, 48, 72]
The sum of the array elements is: 182
The average of the array elements is: 36.4
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```

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

```

src > Ex6 > AddTwoMatrices.java > AddTwoMatrices > main(String[])
4
5 public class AddTwoMatrices {
6     public static void main(String[] args) {
7         Scanner scan = new Scanner(System.in);
8         System.out.println("Enter the number of rows and columns of the matrices: ");
9         int rows = scan.nextInt();
10        int cols = scan.nextInt();
11        int[][] matrix1 = new int[rows][cols];
12        int[][] matrix2 = new int[rows][cols];
13
14        System.out.println("Enter the values of the first matrix:");
15        for (int i = 0; i < rows; i++) {
16            for (int j = 0; j < cols; j++) {
17                matrix1[i][j] = scan.nextInt();
18            }
19        }
20        System.out.println("Enter the values of the second matrix:");
21        for (int i = 0; i < rows; i++) {
22            for (int j = 0; j < cols; j++) {
23                matrix2[i][j] = scan.nextInt();
24            }
25        }
26
27        // Add the matrices
28        int[][] result = new int[rows][cols];
29        for (int i = 0; i < rows; i++) {
30            for (int j = 0; j < cols; j++) {
31                result[i][j] = matrix1[i][j] + matrix2[i][j];
32            }
33        }
34
35        // Print the result
36        System.out.println("The sum of two matrices is:");
37        for (int i = 0; i < rows; i++) {
38            for (int j = 0; j < cols; j++) {
39                System.out.print(result[i][j] + " ");
40            }
41            System.out.println();
42        }
43    }
44 }

```

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```

PS E:\cokhibk\OOP_Lab_20210553\Lab1> & "D:\java-1.8.0-openjdk-1.8.0.345-1.b01.redhat.windows.x86_64\bin\java.exe" -agentlib:jdwp=transport=dt_socket,server=y,suspend=y,address=localhost:50592" -cp "E:\cokhibk\OOP_Lab_20210553\Lab1\bin" "Ex6.AddTwoMatrices"
Enter the number of rows and columns of the matrices:
2 3
Enter the values of the first matrix:
3 5 6
1 9 1
Enter the values of the second matrix:
6 7 4
8 8 8
The sum of two matrices is:
9 12 10
9 17 9
PS E:\cokhibk\OOP_Lab_20210553\Lab1>

```