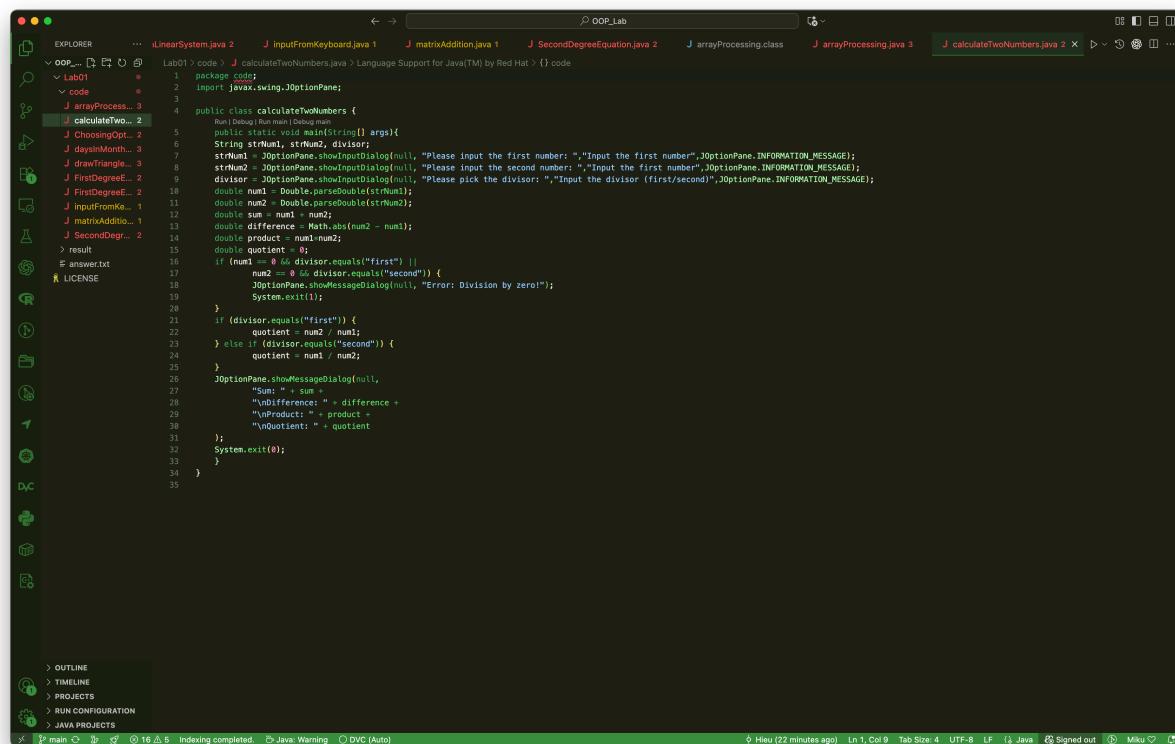


Lab01 Report

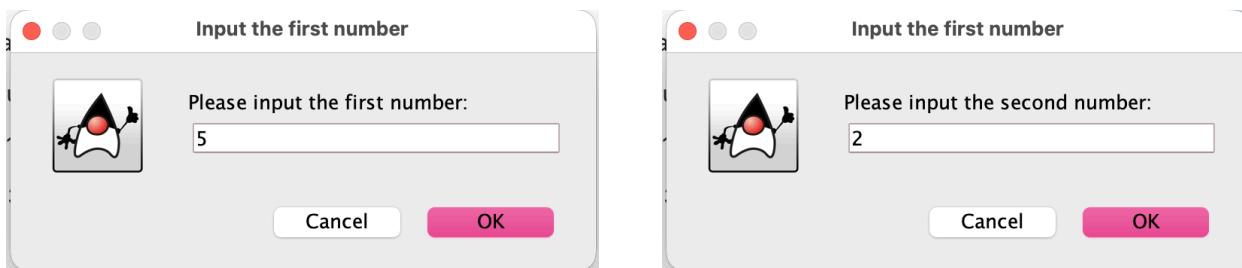
2.2.5

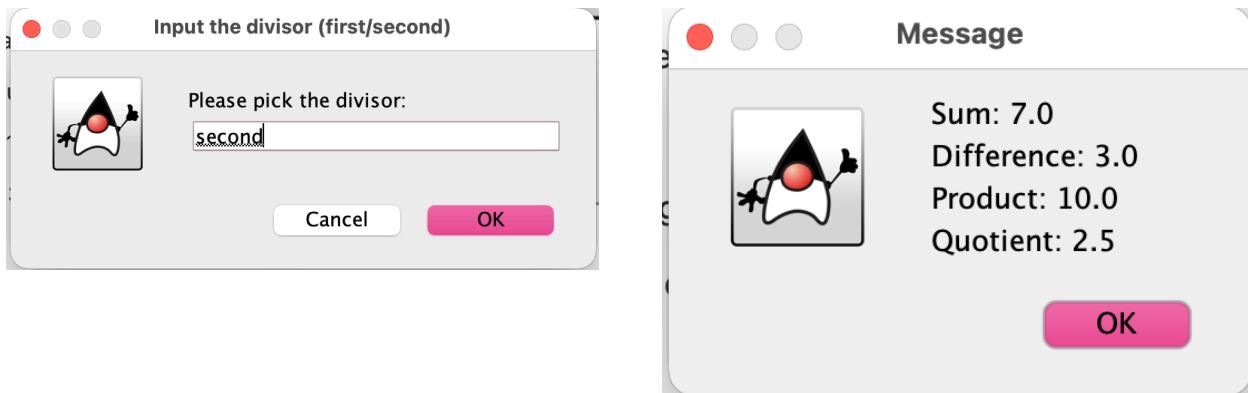


The screenshot shows an IDE interface with a dark theme. The left sidebar displays a project structure under 'EXPLORER' with several Java files listed. The main editor window contains the following Java code:

```
package code;
import javax.swing.JOptionPane;

public class calculateTwoNumbers {
    public static void main (String[] args){
        String strNum1, strNum2, divisor;
        strNum1 = JOptionPane.showInputDialog(null, "Please input the first number:","");
        strNum2 = JOptionPane.showInputDialog(null, "Please input the second number:","");
        divisor = JOptionPane.showInputDialog(null, "Please pick the divisor:","");
        double num1 = Double.parseDouble(strNum1);
        double num2 = Double.parseDouble(strNum2);
        double sum = num1 + num2;
        double difference = Math.abs(num2 - num1);
        double product = num1 * num2;
        double quotient = 0;
        if (num1 == 0 & divisor.equals("first")){
            num2 = 0 & divisor.equals("second")){
                quotient = num1 / num2;
            }
        JOptionPane.showMessageDialog(null,
            "sum: " + sum +
            "\ndifference: " + difference +
            "\nproduct: " + product +
            "\nquotient: " + quotient
        );
        System.exit(0);
    }
}
```





2.2.6

The first-degree equation (linear equation) with one variable

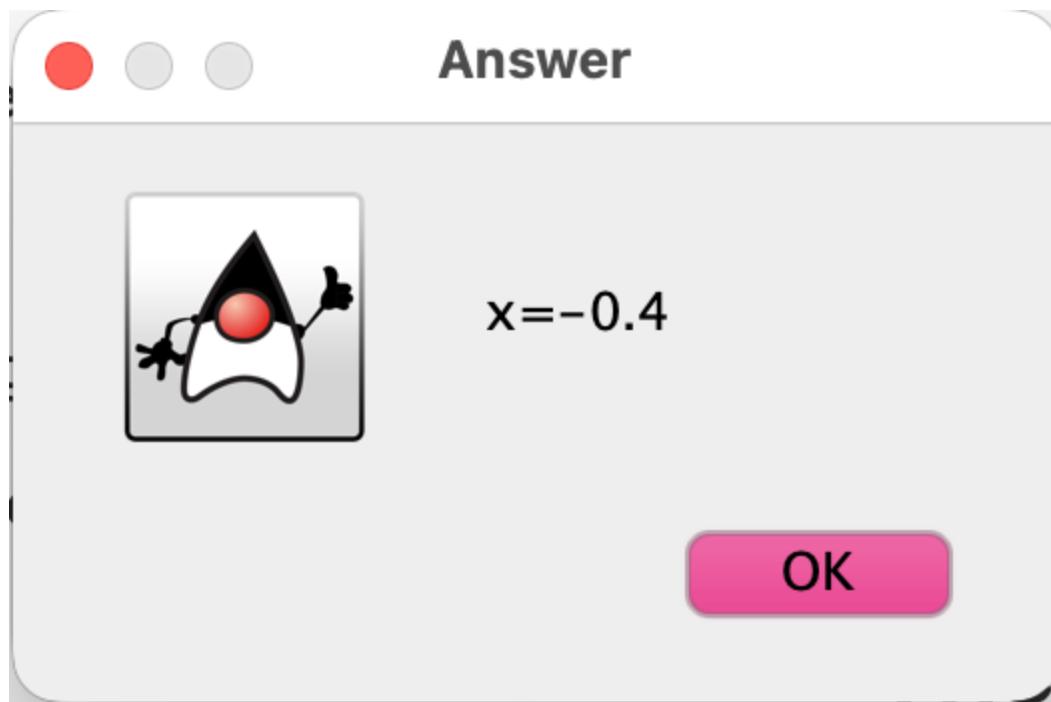
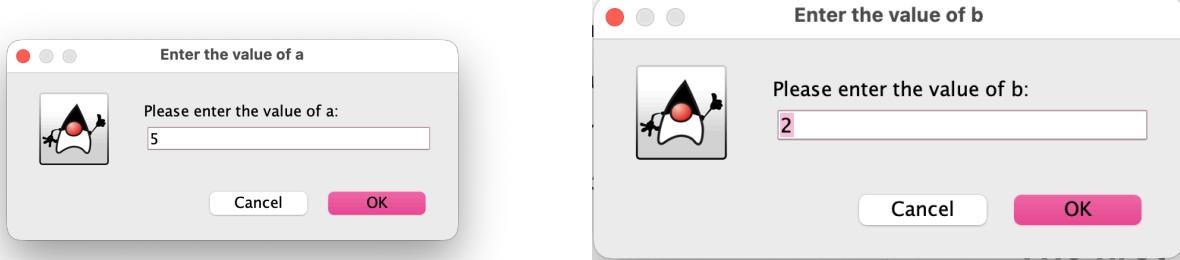
```

package code;
import javax.swing.JOptionPane;
//ax + b = 0
public class FirstDegreeEquation {
    public static void main(String[] args){
        String sao,bb;
        sao = JOptionPane.showInputDialog(null, "Please enter the value of a:", JOptionPane.INFORMATION_MESSAGE);
        bb = JOptionPane.showInputDialog(null, "Please enter the value of b:", JOptionPane.INFORMATION_MESSAGE);
        double a = Double.parseDouble(sao);
        double b = Double.parseDouble(bb);

        if (a == 0){
            if (b == 0){
                JOptionPane.showMessageDialog(null, "All real numbers are root", "Answer", JOptionPane.INFORMATION_MESSAGE );
            }
            else {
                JOptionPane.showMessageDialog(null, "No real roots", "Answer", JOptionPane.INFORMATION_MESSAGE );
            }
        }
        else{
            JOptionPane.showMessageDialog(null,"x=" + -b/a, "Answer", JOptionPane.INFORMATION_MESSAGE );
        }
    }
}

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS
(base) Hieu-MacBook-Pro:OOP_Lab hieunguyen\$ java Lab01/code/daysInMonth.java
November 2007 has 30 days.
(base) Hieu-MacBook-Pro:OOP_Lab hieunguyen\$ java Lab01/code/arrayProcessing.java
Enter number of elements: 4
Enter elements: 2020 2073 2435 7286
Sorted array: [2435, 2673, 2986, 7286]
Sum = 10000
Average = 3845.0
(base) Hieu-MacBook-Pro:OOP_Lab hieunguyen\$ java Lab01/code/matrixAddition.java
Enter number of rows: 3
Enter number of cols: 3
Enter matrix A:
1 2 3
4 5 6
7 8 9
Enter matrix B:
2 4 5 3 2 4 5 6 3
Result matrix C:
3 6 8
8 9 6
(base) Hieu-MacBook-Pro:OOP_Lab hieunguyen\$ java Lab01/code/FirstDegreeEquation.java
2025-10-16 17:47:46.000 [main] INFO code.FirstDegreeEquation - The program is implemented reliable
Exception in thread "main" java.lang.NullPointerException: Cannot invoke "String.trim()" because "in" is null
at java.base/jdk.internal.math.FloatingDecimal.readJavaFormatString(FloatingDecimal.java:1838)
at java.base/jdk.internal.math.FloatingDecimal.parseDouble(FloatingDecimal.java:116)
at java.base/java.lang.Double.parseDouble(Double.java:971)
at code.FirstDegreeEquation.main(FirstDegreeEquation.java:11)



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

The screenshot shows an IDE interface with multiple tabs open. The active tab is 'FirstDegreeEquation.java'. The code implements a class 'FirstDegreeFaustinaLinearSystem' that handles user input for coefficients a1, a2, b1, b2, and b0, and calculates the determinant D and the solution x = -Dx/b. It also checks for infinite solutions (M=0) and no solution (M!=0).

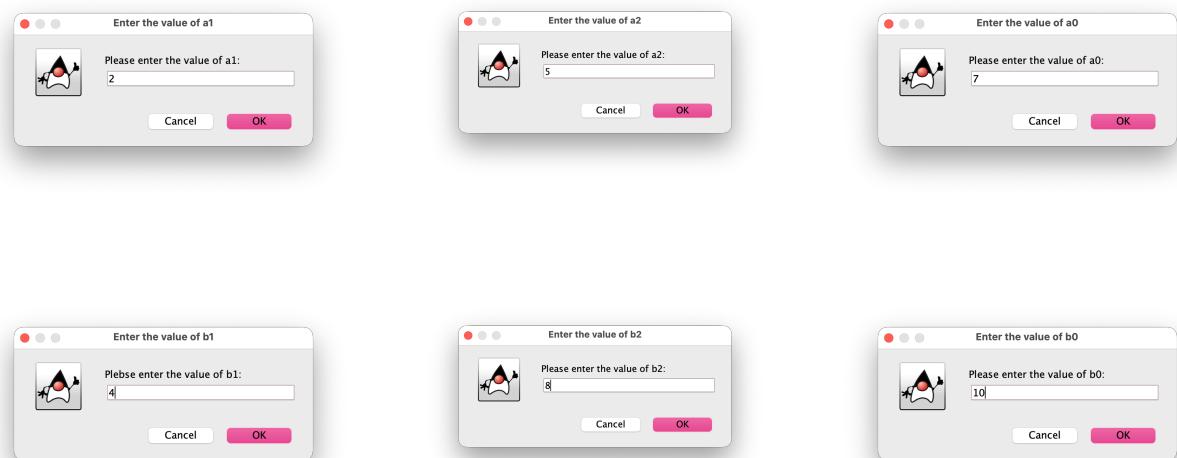
```

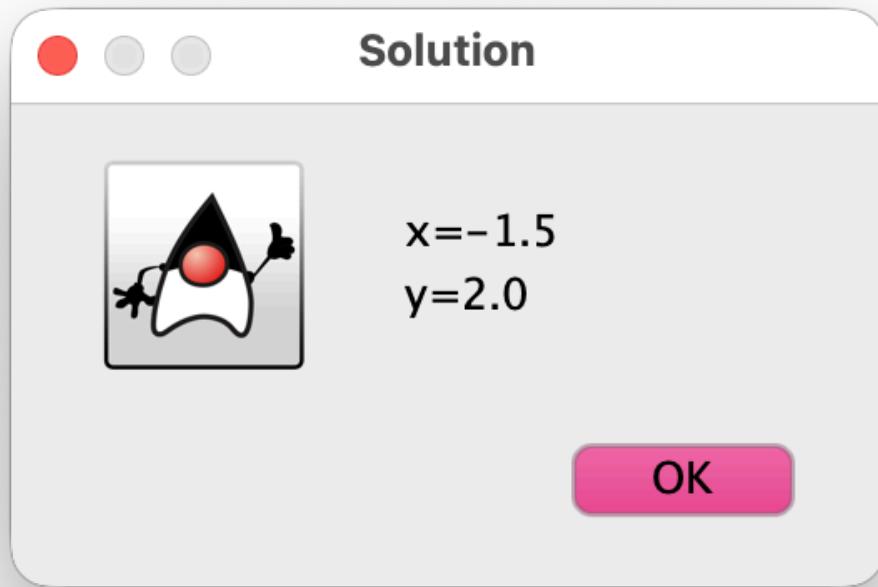
1 package Lab01;
2 import javax.swing.JOptionPane;
3
4 public class FirstDegreeFaustinaLinearSystem {
5     public static void main(String[] args) {
6         String s1,s2,s0,s1b,s2b;
7
8         s1=JOptionPane.showInputDialog(null, "Please enter the value of a1:","Enter the value of a1", JOptionPane.INFORMATION_MESSAGE);
9         s2=JOptionPane.showInputDialog(null, "Please enter the value of a2:","Enter the value of a2", JOptionPane.INFORMATION_MESSAGE);
10        s0=JOptionPane.showInputDialog(null, "Please enter the value of a0:","Enter the value of a0", JOptionPane.INFORMATION_MESSAGE);
11
12        double a1=Double.parseDouble(s1);
13        double a2=Double.parseDouble(s2);
14        double a0=Double.parseDouble(s0);
15
16        s1b=JOptionPane.showInputDialog(null, "Please enter the value of b1:","Enter the value of b1", JOptionPane.INFORMATION_MESSAGE);
17        s2b=JOptionPane.showInputDialog(null, "Please enter the value of b2:","Enter the value of b2", JOptionPane.INFORMATION_MESSAGE);
18        s0b=JOptionPane.showInputDialog(null, "Please enter the value of b0:","Enter the value of b0", JOptionPane.INFORMATION_MESSAGE);
19
20        double b1=Double.parseDouble(s1b);
21        double b2=Double.parseDouble(s2b);
22        double b0=Double.parseDouble(s0b);
23
24
25        double D=(a1*b2-a2*b1);
26        double Dx=(-a2*a0-a1*b2);
27        double D0x=(a1*a0-a0*a1);
28
29        if (D==0){
30            JOptionPane.showMessageDialog(null, "x=-Dx/D" +"\n" + "y=-D2x/D","Solution", JOptionPane.INFORMATION_MESSAGE);
31        }
32        else{
33            double M=a1/a2;
34            double N=b0/a2;
35            if (M==N){
36                JOptionPane.showMessageDialog(null, "Infinite solutions","Result", JOptionPane.INFORMATION_MESSAGE);
37            }
38            if (M!=N){
39                JOptionPane.showMessageDialog(null, "No solution","Result", JOptionPane.INFORMATION_MESSAGE);
40            }
41        }
42    }
}

```

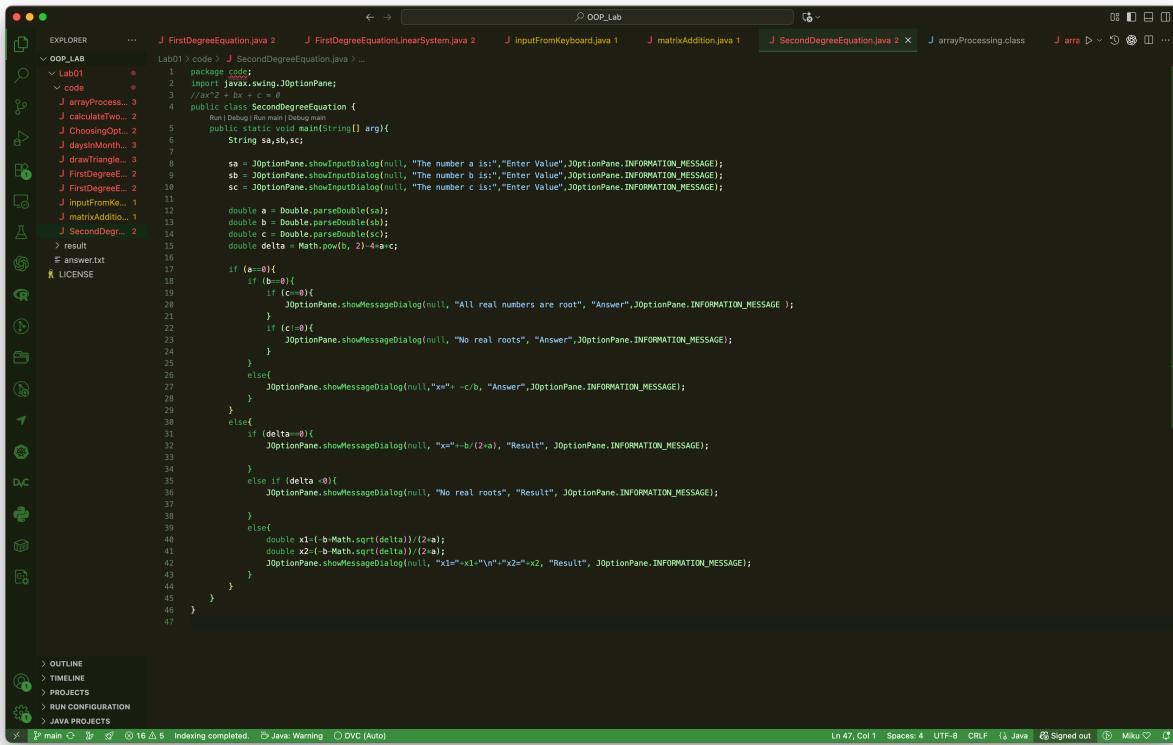
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS

(base) Hieu-MacBook-Pro:oop_Lab hieuenguyen\$ cd ..\oop_Lab\src\main\java\Lab01\code\FirstDegreeEquationLinearSystem.java
(base) Hieu-MacBook-Pro:oop_Lab hieuenguyen\$ java Lab01\code\FirstDegreeEquationLinearSystem
2025-10-03 16:34:47.938 java[40105:1799468] error messaging the mach port for IMKCFCRunLoopWakeUpReliable
Exception in thread "main" java.lang.NullPointerException: Cannot invoke "String.trim()" because "in" is null
at java.base/jdk.internal.math.FloatingDecimal.readJavaFormatString(FloatingDecimal.java:1838)
at java.base/jdk.internal.math.FloatingDecimal.of(FloatingDecimal.java:141)
at java.base/java.lang.Double.parseDouble(Double.java:97)
(base) Hieu-MacBook-Pro:oop_Lab hieuenguyen\$ java Lab01\code\SecondDegreeEquation.java
2025-10-03 16:38:47.225 java[40682:1799771] error messaging the mach port for IMKCFCRunLoopWakeUpReliable
(base) Hieu-MacBook-Pro:oop_Lab hieuenguyen\$ java Lab01\code\ChoosingOption.java
(base) Hieu-MacBook-Pro:oop_Lab hieuenguyen\$ java Lab01\code\ChoosingOption.java





The second-degree equation with one variable

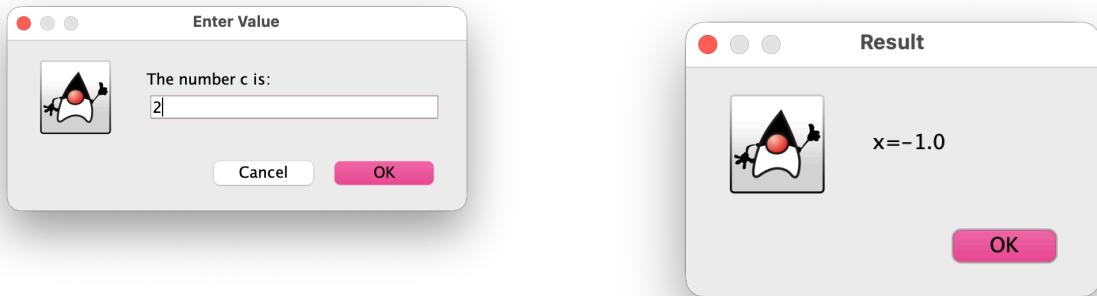


```

package Lab01;
import javax.swing.JOptionPane;
public class SecondDegreeEquation {
    public static void main(String[] args){
        String sa, sb, sc;
        sa = JOptionPane.showInputDialog(null, "The number a is:", "Enter Value", JOptionPane.INFORMATION_MESSAGE);
        sb = JOptionPane.showInputDialog(null, "The number b is:", "Enter Value", JOptionPane.INFORMATION_MESSAGE);
        sc = JOptionPane.showInputDialog(null, "The number c is:", "Enter Value", JOptionPane.INFORMATION_MESSAGE);
        double a = Double.parseDouble(sa);
        double b = Double.parseDouble(sb);
        double c = Double.parseDouble(sc);
        double delta = Math.pow(b, 2) - 4*a*c;
        if (a==0){
            if (b==0){
                if (c==0){
                    JOptionPane.showMessageDialog(null, "All real numbers are root", "Answer", JOptionPane.INFORMATION_MESSAGE );
                }
                if (c!=0){
                    JOptionPane.showMessageDialog(null, "No real roots", "Answer", JOptionPane.INFORMATION_MESSAGE );
                }
            }
            else{
                JOptionPane.showMessageDialog(null, "x=" + -c/b, "Answer", JOptionPane.INFORMATION_MESSAGE );
            }
        }
        else{
            if (delta==0){
                JOptionPane.showMessageDialog(null, "x=" + -b/(2*a), "Result", JOptionPane.INFORMATION_MESSAGE );
            }
            else if (delta <0){
                JOptionPane.showMessageDialog(null, "No real roots", "Result", JOptionPane.INFORMATION_MESSAGE );
            }
            else{
                double x1=(-b+Math.sqrt(delta))/(2*a);
                double x2=(-b-Math.sqrt(delta))/(2*a);
                JOptionPane.showMessageDialog(null, "x1=" + x1 + "\n" + "x2=" + x2, "Result", JOptionPane.INFORMATION_MESSAGE );
            }
        }
    }
}

```





6.1

Screenshot of an IDE showing a Java project named 'OOP_Lab'. The 'EXPLORER' view shows several Java files: ChoosingOption.java, daysinMonth.java, drawTriangle.java, FirstDegreeEquation.java, FirstDegreeEquationLinearSystem.java, inputFromKeyboard.java, and matrixAddition.java. The 'ChoosingOption.java' file is selected and its code is visible:

```

package code;
import javax.swing.*;
public class ChoosingOption {
    public static void main(String[] args) {
        int option = JOptionPane.showConfirmDialog(null,
            "Do you want to change to the first class ticket?");
        JOptionPane.showMessageDialog(null,
            "You have chosen: " + (option == JOptionPane.YES_OPTION ? "yes" :
            option == JOptionPane.NO_OPTION ? "No" : "Cancel"));
        // Custom option
        Object[] options = {"I do", "I don't"};
        int choice = JOptionPane.showOptionDialog(null,
            "Do you love Java?", "Custom Option Dialog",
            JOptionPane.YES_NO_OPTION,
            JOptionPane.QUESTION_MESSAGE,
            null,
            options,
            options[0]);
        JOptionPane.showMessageDialog(null, "Your choice: " + options[choice]);
    }
}

```

The status bar at the bottom shows: 'Hieu (19 minutes ago) Ln 1, Col 9 Spaces: 8 UTF-8 LF Java Signed out Miku'.



6.2

```
Lab01 > code > J inputFromKeyboard.java > Language Support for Java(TM) by Red Hat > {} code
1 package com;
2 import java.util.Scanner;
3
4 public class InputFromKeyboard {
5     public static void main(String[] args) {
6         Scanner scanner = new Scanner(System.in);
7
8         System.out.print("What's your name? ");
9         String name = scanner.nextLine();
10
11        System.out.print("How old are you? ");
12        int age = scanner.nextInt();
13
14        System.out.print("How tall are you (m)? ");
15        double height = scanner.nextDouble();
16
17        System.out.println("Mrs/Ms. " + name + ", " + age + " years old. " +
18                           "Your height is " + height + " m.");
19
20        scanner.close();
21    }
22}
```

```
(base) Hieu-MacBook-Pro:00P_Lab hieunguyen$ java Lab01/code/inputFromKeyboard.java
What's your name? Hieu
How old are you? 19
How tall are you (m)? 1.62
Mrs/Ms. Hieu, 19 years old. Your height is 1.62 m.
```

6.3

The screenshot shows the VS Code interface with the following details:

- EXPLORER**: Shows a project structure for "OOP_Lab" with a sub-project "Lab01". Inside "Lab01", there are several Java files: ChoosingOption.java, drawTriangle.java, daysinMonth.java, FirstDegreeEquation.java, FirstDegreeEquationLinearSystem.java, inputFromKeyboard.java, and matrixAddition.java. There is also an "answer.txt" file and a "LICENSE" file.
- PROBLEMS**: Displays a warning message from Python's zstandard module: "The default interactive shell is now zsh. To update your configuration for this shell, run 'chsh -s /bin/zsh'. For more details, please visit https://support.apple.com/kb/HT208050." Below this, it lists multiple errors from Java, such as "error messaging the mach port for IMKCRunLoopWakeUpReliable" and "error messaging the mach port for IMKCRunLoopWakeUpReliable".
- OUTPUT**: Shows the command "java Lab01/code/drawTriangle.java" and the user input "Enter height n: 5".
- DEBUG CONSOLE**: Shows the output of the Java program, which prints a triangle made of asterisks: *

- TERMINAL**: Shows the command "java Lab01/code/drawTriangle.java" and the user input "Enter height n: 5".
- PORTS**: Shows network port information.
- GITLENS**: Shows Git-related information.
- STATUS BAR**: Shows the user "Hieu" (17 hours ago), line 17, column 2, spaces 4, UTF-8 encoding, Java language, signed out, and Miku theme.

```
(base) Hieus-MacBook-Pro:OOP_Lab hieunguyen$ java Lab01/code/drawTriangle.java
Enter height n: 5
*
***
****
*****
```

6.4

```

public class daysInMonth {
    public static boolean isLeapYear(int year) {
        return (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String[] monthNames = {"January", "February", "March", "April", "May", "June",
                               "July", "August", "September", "October", "November", "December"};
        System.out.print("Enter month (name/abbr/number): ");
        String monthInput = sc.nextLine();
        System.out.print("Enter year: ");
        int year = sc.nextInt();

        if (year < 0) {
            System.out.println("Invalid year. Try again.");
            continue;
        }

        int month = -1;
        // Check month
        try {
            month = Integer.parseInt(monthInput);
        } catch (NumberFormatException e) {}

        // Check string
        if (month == -1) {
            for (int i = 0; i < 12; i++) {
                if (monthNames[i].equalsIgnoreCase(monthInput)) {
                    monthNames[i].substring(0,3).concat(".").equalsIgnoreCase(monthInput)) {
                        month = i + 1;
                        break;
                    }
                }
            }
        }

        if (month < 1 || month > 12) {
            System.out.println("Invalid month. Try again.");
            continue;
        }

        int[] daysInMonth = {31,28,31,30,31,30,31,31,30,31,30,31};
        int days = daysInMonth[month-1];
        if (month == 2 && isLeapYear(year)) days = 29;

        System.out.println("Month " + monthNames[month-1] + " " + year + " has " + days + " days.");
        sc.close();
    }
}

```

```
(base) Hieus-MacBook-Pro:00P_Lab hieunguyen$ java Lab01/code/daysInMonth.java
Enter month (name/abbr/number): august
Enter year: 2007
Month August 2007 has 31 days.
```

6.5

The screenshot shows the Eclipse IDE interface with the following details:

- Project Explorer:** Shows the project structure with files like Lab01 > code > arrayProcessing.java, InputFromKeyboard.java, matrixAddition.java, SecondDegreeEquation.java, and arrayProcessing.class.
- Code Editor:** Displays the content of arrayProcessing.java. The code reads user input for the number of elements and a series of numbers, sorts them, calculates the sum and average, and prints the results.
- Bottom Status Bar:** Shows indexing status (Indexing completed), Java warning, DVC status, and user information (Hieu, 20 minutes ago).

```
public class arrayProcessing {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter number of elements: ");
        int n = sc.nextInt();
        int[] arr = new int[n];
        System.out.println("Enter " + n + " numbers:");
        for (int i = 0; i < n; i++) arr[i] = sc.nextInt();
        Arrays.sort(arr);
        System.out.println("Sorted array: " + Arrays.toString(arr));
        int sum = 0;
        for (int num : arr) sum += num;
        double avg = (double) sum / n;
        System.out.println("Sum = " + sum);
        System.out.println("Average = " + avg);
        sc.close();
    }
}
```

```
(base) Hieus-MacBook-Pro:OOP_Lab hieunguyen$ java Lab01/code/arrayProcessing.java
Enter number of elements: 4
Enter 4 numbers:
2986 2673 2435 7286
Sorted array: [2435, 2673, 2986, 7286]
Sum = 15380
Average = 3845.0
```

6.6

```

package code;
import java.util.Scanner;

public class matrixAddition {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter number of rows: ");
        int rows = sc.nextInt();
        System.out.print("Enter number of cols: ");
        int cols = sc.nextInt();
        int[][] A = new int[rows][cols];
        int[][] B = new int[rows][cols];
        int[][] C = new int[rows][cols];
        System.out.println("Enter matrix A:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                A[i][j] = sc.nextInt();
            }
        }
        System.out.println("Enter matrix B:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                B[i][j] = sc.nextInt();
            }
        }
        System.out.println("Result matrix C:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                System.out.print(C[i][j] + " ");
            }
            System.out.println();
        }
        sc.close();
    }
}

```

OUTLINE
TIMELINE
PROJECTS
RUN CONFIGURATION
JAVA PROJECTS

```
(base) Hieus-MacBook-Pro:00P_Lab hieunguyen$ java Lab01/code/matrixAddition.java
Enter number of rows: 3
Enter number of cols: 3
Enter matrix A:
1 2 3 5 3 2 4 2 3
Enter matrix B:
2 4 5 3 2 4 5 6 3
Result matrix C:
3 6 8
8 5 6
9 8 6
```