```java
import java.util.Scanner;
public class lab1 {
    public static void main(String[] args) {

        try (Scanner scanner = new Scanner(System.in)) {

            System.out.print("Enter coefficient a: ");
            double a = scanner.nextDouble();
            System.out.print("Enter coefficient b: ");
            double b = scanner.nextDouble();
            System.out.print("Enter coefficient c: ");
            double c = scanner.nextDouble();

            if (a == 0) {
                System.out.println("Coefficient a cannot be zero for a quadratic equation.");
                return;
            }
            double discriminant = b * b - 4 * a * c;

            if (discriminant > 0) {

                double sqrtDiscriminant = Math.sqrt(discriminant);
                double root1 = (-b + sqrtDiscriminant) / (2 * a);
                double root2 = (-b - sqrtDiscriminant) / (2 * a);
                System.out.println("The roots are real and different.");
                System.out.println("Root 1: " + root1);
                System.out.println("Root 2: " + root2);
            } else if (discriminant == 0) {

                double root = -b / (2 * a);
                System.out.println("The root is real and repeated.");
                System.out.println("Root: " + root);
            } else {

                System.out.println("There are no real solutions.");
            }

        }
    }
}
```

```
Microsoft Windows [Version 10.0.22631.4460]
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C:\Users\sanch>cd C:\Users\sanch\Desktop\java

C:\Users\sanch\Desktop\java>javac lab1.java

C:\Users\sanch\Desktop\java>java lab1
Enter coefficient a: 12
Enter coefficient b: 13
Enter coefficient c: 14
There are no real solutions.

C:\Users\sanch\Desktop\java>java lab1
Enter coefficient a: 2
Enter coefficient b: 1
Enter coefficient c: 0
The roots are real and different.
Root 1: 0.0
Root 2: -0.5

C:\Users\sanch\Desktop\java>java lab1
Enter coefficient a: 1
Enter coefficient b: 2
Enter coefficient c: 1
The root is real and repeated.
Root: -1.0
```

Develop a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use quadratic formula. If discriminant is negative, display there are no

26/09/2024        real solutions.

## Quadratic Equation

```java
import java.util.scanner;

public class QuadraticSolver {
    public static void main(String[] args){

        System.out.print("Enter Coefficient a:");
        double a = scanner.nextDouble();
        System.out.print("Enter coefficient b:");
        double b = scanner.nextDouble();
        System.out.print("Enter Coefficient c:");
        double c = scanner.nextDouble();
        double discriminant = b*b - 4*a*c;
        if(discriminant > 0){
            double root1 = (-b + Math.sqrt(discriminant))/(2*a);
            double root2 = (-b + Math.sqrt(discriminant))/(2*a);
            System.out.print("Roots are real and different");
        }

        else if(discriminant == 0){
            double root = -b/(2*a);
            System.out.print("Roots are real and same, root);
        } else {
            double real part = -b/(2*a);
            double imaginary part = math.sqrt(-discriminant)/(2*a);
            System.out.print("Roots are complex and different [m Root1 = %.2f + %.2f i m
            Root2 = %.2f - %.2f i m);
```

```
        }
    Scanner.close()
    }
}
```

Output:→ Enter Coefficient a: 12
         Enter coefficient b: 13
         Enter coefficient c: 14
         Roots are complex and different
         Root 1 = -0.54 + 0.93i
         Root 2 = -0.54 - 0.93i


Enter coefficient a: 2
Enter coefficient b: 1
Enter coefficient c: 0
Roots are real and distinct
Root 1 = 0.00
    Root 2 = -0.50


Enter coefficient a: 1
Enter coefficient b: 2
Enter coefficient c: 1
Roots are real and same
Root = -1.0

26/9/24