LAB program 1

Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions

.

code:

```
import java.util.Scanner;

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

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter coefficient a: ");
        double a = sc.nextDouble();

        System.out.println("Enter coefficient b: ");
        double b = sc.nextDouble();

        System.out.println("Enter coefficient c: ");
        double c = sc.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.println("The roots are real and distinct.");
            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 roots are real and equal.");
            System.out.println("Root = " + root);
        } else {

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

```
        }

        sc.close();
    }
}
```

//output:

```
Enter coefficient a:
1
Enter coefficient b:
-5
Enter coefficient c:
6
The roots are real and distinct.
Root 1 = 3.0
Root 2 = 2.0
PS E:\java lab>

Enter coefficient a:
1
Enter coefficient b:
-4
Enter coefficient c:
4
The roots are real and equal.
Root = 2.0
PS E:\java lab>

Enter coefficient a:
1
Enter coefficient b:
4
Enter coefficient c:
5
There are no real solutions.
PS E:\java lab>
```

Observation:

Lab Program 1

Quadratic Equation

8) Develop Java program that prints all real solutions to $ax^2+bx+c=0$. Read in a, b, c & use quadratic formula. If discriminant b^2-4ac is negative. Display message stating that there are no real solutions.

```
import java.util.Scanner;
public class QuadraticEquation {
    public static void main (String[] args) {
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter coefficient a: ");
        double a = sc.nextDouble();
        System.out.println("Enter coefficient b: ");
        double b = sc.nextDouble();
        System.out.println("Enter coefficient c: ");
        double c = sc.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);
            Sout("Roots are real and distinct");
            Sout("Root 1=" + root1);
            Sout(" Root2 =" + root2);
        }

        else if (discriminant==0) {
            double root= -b/(2*a);
            Sout ("Roots are real and equal");
            Sout ("Root =" + root);
        }
```

```
        else{
            Sout ("There are no real solutions.");
        }
        sc.close();
    }
}
```

// output 1

```
Enter the coefficient a:
1
Enter the coefficient b:
-3
Enter the coefficient c:
2
The equation has two real and distinct roots:
Root 1: 2.0
Root 2: 1.0
```

// output 2

```
Enter the coefficient a:
1
Enter the coefficient b:
1
Enter the coefficient c:
1
There are no real solutions to the equation.
```

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