Aim:

Write a Java Program to find **Roots** of a Quadratic Equation.

Refer to the displayed sample test cases to strictly match the input and output layout.

Source Code:

q27331/QuadraticEquation.java

```java
package q27331;
import java.io.*;
import java.util.Scanner;
import java.lang.Math;
class QuadraticEquation
    {
        public static void main(String args[])
        {
            double a,b,c;
            Scanner obj=new Scanner(System.in);
            System.out.print("Coefficient a: ");
            a=obj.nextDouble();
            System.out.print("Coefficient b: ");
            b=obj.nextDouble();
            System.out.print("Coefficient c: ");
            c=obj.nextDouble();
            double d=b*b-4*a*c;
            double r1=(-b+Math.sqrt(d))/(2*a);
            double r2=(-b-Math.sqrt(d))/(2*a);
            if(d==0)
            {
                System.out.println("The roots are real and equal");
                System.out.println("Root: "+r1);
            }
            else if(d>0){
                System.out.println("The roots are real and distinct");
                System.out.println("Root1: "+r1+" Root2: "+r2);
            }
            else
                System.out.println("The roots are imaginary");
        }
    }
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Coefficient a: 1
Coefficient b: 6
Coefficient c: 9
The roots are real and equal

```
Root: -3.0
```

Test Case - 2
User Output
Coefficient a: 1
Coefficient b: 5
Coefficient c: 8
The roots are imaginary

Test Case - 3
User Output
Coefficient a: 2
Coefficient b: 6
Coefficient c: 1
The roots are real and distinct
Root1: -0.17712434446770464 Root2: -2.8228756555322954

Test Case - 4
User Output
Coefficient a: 2
Coefficient b: 6
Coefficient c: 4
The roots are real and distinct
Root1: -1.0 Root2: -2.0