Program-1

Develop a Java Program that prints all solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula.

CODE:

```
import java.util.Scanner;
class Quad
{
	double d, r1, r2;
	Quad(double a, double b, double c)
	{
		if(a==0)
		{
			System.out.println("Coefficient 'a' can not be zero for this.");
		}
		else
		{
			d = b*b-4*a*c;
			if(d>0)
			{
				System.out.println("The roots are real and distinct");
				r1 = (-b+Math.sqrt(d))/(2*a);
				r2 = (-b-Math.sqrt(d))/(2*a);
				System.out.println("First root is: " + r1 +"\nSecond Root is: "
+r2);
			}
			else if(d==0)
			{
				System.out.println("The roots are real and equal");
```

```
                    r1 = -b/(2*a);
                    System.out.println("The roots are both: " + r1);
                }
                else
                {
                    System.out.println("The roots are imaginary and distinct.");
                    r1 = -b/(2*a);
                    r2 = (Math.sqrt(Math.abs(d)))/(2*a);
                    System.out.println("First root is:" + r1 + "+i" + r2);
                    System.out.println("Second root is:" + r1 + "-i" + r2);
                }
            }
        }
}

class Quadratic_Equations
{
    public static void main(String args[])
    {
        System.out.println("Enter your coefficients:\n");
        Scanner ss = new Scanner(System.in);
        Quad One = new Quad(ss.nextInt(), ss.nextInt(), ss.nextInt());
    }
}
```

OUTPUT SCREENSHOT:

```
C:\Users\BMSCECSE\Desktop\1BM21CS246\JAVA>java Quadratic_Equations
Enter your coefficients:

1 -2 1
The roots are real and equal
The roots are both: 1.0

C:\Users\BMSCECSE\Desktop\1BM21CS246\JAVA>java Quadratic_Equations
Enter your coefficients:

20 1 1
The roots are imaginary and distinct.
First root is:-0.025+i0.22220486043288973
Second root is:-0.025-i0.22220486043288973

C:\Users\BMSCECSE\Desktop\1BM21CS246\JAVA>java Quadratic_Equations
Enter your coefficients:

1 20 1
The roots are real and distinct
First root is: -0.05012562893380057
Second Root is: -19.9498743710662

C:\Users\BMSCECSE\Desktop\1BM21CS246\JAVA>java Quadratic_Equations
Enter your coefficients:

0 1 1
Coefficient 'a' can not be zero for this.

C:\Users\BMSCECSE\Desktop\1BM21CS246\JAVA>
```