

LAB 1

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 the quadratic formula. If the discriminate $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

```
import java.util.Scanner;
class quad
{
    public static void main (String args[])
    {
        System.out.println("Enter the coefficients a & b & c of quadratic equation  $ax^2+bx+c=0$  and
where a is not 0");
        Scanner sc = new Scanner(System.in);
        double a = sc.nextInt();
        if (a==0)
        {
            System.out.println("a can't be zero");
        }
        else
        {
            double b=sc.nextInt();
            double c=sc.nextInt();
            double z=b*b-4*a*c;
            Equation eq=new Equation();
            if (z<0)
            {
                System.out.println("There are no real solutions");
            }
            else if(z==0)
            {
                System.out.println("The solutions are real and equal");
                eq.check(a,b,c);
                eq.display();
            }
            else
            {
                System.out.println("The solutions are real and distinct");
                eq.check(a,b,c);
                eq.display();
            }
        }
    }
}
```

```

}
class Equation
{
    double a;
    double b;
    double c;
    double r1;
    double r2;
    void check(double a,double b,double c)
    {
        this.a=a;
        this.b=b;
        this.c=c;
        double z=Math.pow( b*b-4*a*c , 0.5 );
        r1=(-b-z)/(2*a);
        r2=(-b+z)/(2*a);
    }
    void display()
    {
        System.out.println(r1);
        System.out.println(r2);
    }
}

```

```

Command Prompt
D:\coding_files\00J Lab>javac l1.java

D:\coding_files\00J Lab>java quad
Enter the coefficients a & b & c of quadratic equation ax2+bx+c=0 and where a is not 0
0
a can't be zero

D:\coding_files\00J Lab>java quad
Enter the coefficients a & b & c of quadratic equation ax2+bx+c=0 and where a is not 0
2
13
11
The solutions are real and distinct
-5.5
-1.0

D:\coding_files\00J Lab>java quad
Enter the coefficients a & b & c of quadratic equation ax2+bx+c=0 and where a is not 0
3
12
12
The solutions are real and equal
-2.0
-2.0

D:\coding_files\00J Lab>java quad
Enter the coefficients a & b & c of quadratic equation ax2+bx+c=0 and where a is not 0
8
-9
11
There are no real solutions

D:\coding_files\00J Lab>java quad
Enter the coefficients a & b & c of quadratic equation ax2+bx+c=0 and where a is not 0
2
4
-4
The solutions are real and distinct
-2.732050807568877
0.7320508075688772

D:\coding_files\00J Lab>java quad
Enter the coefficients a & b & c of quadratic equation ax2+bx+c=0 and where a is not 0

```

