

## Lab - 1

8. 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 Quadratic
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int a, b, c; double d, r1, r2;
        System.out.println ("Enter the values of a, b, c of
        the quadratic equation  $ax^2 + bx + c = 0$ ");
        a = sc.nextInt();
        b = sc.nextInt();
        c = sc.nextInt();
        if (a == 0)
            System.out.println ("Invalid entry of the value of |a|");
        else
        {
            d = (b*b) - 4*a*c;
            if (d < 0)
                System.out.println ("No real solutions exists!");
            else if (d > 0)
            {
                r1 = (-b + Math.sqrt(d)) / (2*a);
                r2 = (-b - Math.sqrt(d)) / (2*a);
                System.out.println ("Root 1 = " + r1 + " Root 2 = " + r2);
            }
            else
            {
                r1 = -b / (2*a);
                System.out.println ("Root 1 = Root 2 = " + r1);
            }
        }
    }
}
```



Output

Enter the values of a, b, c of the equation  $ax^2+bx+c$

0

1

2

Invalid entry for the value of 'a'.

Enter the values of a, b, c of the equation  $ax^2+bx+c$

4

8

2

No real solution exists!

Enter the values of a, b, c of the equation  $ax^2+bx+c$

1

-12

-28

Root 1 = 14.0

Root 2 = -2.0

Enter the values of a, b, c of the equation  $ax^2+bx+c$

1

4

4

Root 1 = Root 2 = -2.0