

LAB PROGRAM-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 discriminant b^2-4ac is negative, display a message stating that there are no

Program-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.

```
import java.util.*;
import java.math.*;
public class quadratic {
    public static void main (String args[]) {
        Scanner in = new Scanner (System.in);
        System.out.println ("Enter the value of a");
        double a = in.nextDouble();
        System.out.println ("Enter the value of b");
        double b = in.nextDouble();
        System.out.println ("Enter the value of c");
        double c = in.nextDouble();
        if (a != 0) {
            double d = b*b - (4*a*c);
            if (d > 0.0) {
                double r1 = (-b + Math.pow(d, 0.5)) / (2*a);
                double r2 = (-b - Math.pow(d, 0.5)) / (2*a);
                System.out.println ("The roots are real and distinct");
            }
            else if (d == 0.0) {
                double r1 = -b / (2*a);
                System.out.println ("The roots are real and equal");
                System.out.println ("The root is " + r1);
            }
            else {
                System.out.println ("The roots are imaginary");
            }
        }
        else {
            System.out.println ("Invalid Inputs");
        }
    }
}
```

OUTPUT

Enter the value of a
1
Enter the value of b
-3
Enter the value of c
2

Microsoft Windows [Version 10.0.22000.978]

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C:\Users\Avani>cd C:\Users\Avani\Desktop\quadratic equation

C:\Users\Avani\Desktop\quadratic equation>javac quad.java

C:\Users\Avani\Desktop\quadratic equation>java quad.java

Enter the value of a,b and c:

1 2 1

The roots are real and equal. The root is -1.0

C:\Users\Avani\Desktop\quadratic equation>java quad.java

Enter the value of a,b and c:

1 2 3

The roots are imaginary. The roots are $-1.0+0.41421356237309515i$ and $-1.0-2.414213562373095i$

C:\Users\Avani\Desktop\quadratic equation>java quad.java

Enter the value of a,b and c:

1 50 50

The roots are real and distinct. The roots are -1.0208423834364027 and -48.9791576165636

C:\Users\Avani\Desktop\quadratic equation>