

Lap program -> L (IB22CS258)

CLASSMATE
Date 12/12/23
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1. Develop a Java program that prints all real solutions to the quadratic $ax^2 + bx + c = 0$. Read abc and use the quadratic formula. If the ~~difference~~ discriminant $b^2 - 4ac$ is negative, display a message stating they there are no real solutions.

```
import java.util.Scanner;  
class Quadratic  
{  
    int a,b,c;  
    double x1,x2,d;  
    void go()  
    {  
        Scanner s=new Scanner(System.in);  
        System.out.print("Enter the coefficient of abc");  
        a=s.nextInt();  
        b=s.nextInt();  
        c=s.nextInt();  
        if (a==0)  
            System.out.println("No solution");  
        else  
        {  
            d=b*b-4*a*c;  
            if (d<0)  
                System.out.println("No real solution");  
            else  
            {  
                x1=(-b+d)/2/a;  
                x2=(-b-d)/2/a;  
                System.out.println("Roots are "+x1+" and "+x2);  
            }  
        }  
    }  
}
```

{

```
System.out.println("Not a quadratic Eqn");  
System.out.println("Enter a non zero  
value for a.");
```

```
Scanners = new Scanner(System.in);
```

```
a = S.nextInt();
```

{

```
d = b * b - 4 * a * c;
```

```
If (d == 0)
```

{

```
r1 = (-b) / (2 * a);
```

```
System.out.println("Roots are real  
and equal");
```

```
System.out.println("Root1 = Root2 = " + r1);
```

{

```
else if (d > 0)
```

{

```
r1 = ((-b) + (math.sqrt(d))) / (double)  
(2 * a);
```

```
r2 = ((-b) - (math.sqrt(d))) / (double)(2 * a);
```

~~```
System.out.println("Roots are real
and distinct");
```~~

```
System.out.println("Root1 = " + r1 + "Root2
= " + r2);
```

{

else if ( $d < 0$ )

System.out.println("roots are Imaginary");

$$r_1 = (-b) / (2 * a);$$

$$r_2 = \text{Math.sqrt}(-d) / (2 * a);$$

System.out.println("root1 = " + r1 + " + " +  
 $r_2^*$ );

System.out.println("root2 = " + r1 + " - " +  
 $r_2^*$ );

}

Output:

class QuadraticMain

{

public static void main String args[];

{

Quadratic q = new Quadratic();

q.getd()

q.compute();

}

Output.

Enter the coefficient of a,b,c.  
1 2 3

Roots are imaginary

$$\text{Root 1} = -1.0 + i\sqrt{41421356}$$

$$\text{Root 2} = -1.0 - i\sqrt{41421356}$$

Enter the coefficient a,b,c

1 3 1

Roots are real & distinct

$$\text{Root 1} = -0.381966011$$

$$\text{Root 2} = -2.6180388$$

Enter the coefficient a,b,c

5 6 5

Roots are imaginary

$$\text{Root 1} = 0.0 + i0.8$$

$$\text{Root 2} = 0.0 - i0.8$$

S  
12/12/2023