

LAB

12/12/23

LAB 1: quadratic Roots: Develop a Java program that prints all real solutions to the quadratic eq $ax^2 + bx + c = 0$. 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 real solutions.

```
import java.util.Scanner;
```

```
class Quadratic
```

```
{
```

```
    int a, b, c;
```

```
    double r1, r2, d;
```

```
    void getd()
```

```
{
```

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

```
    System.out.println("Enter the coefficient of a,b,c");
```

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

```
    b = s.nextInt();
```

```
    c = s.nextInt();
```

```
}
```

```
    void compute()
```

```
{
```

```
    while (a == 0)
```

```
{
```

```
        System.out.println("Not a quadratic equation");
```

```
        System.out.println("Enter a non zero value of a");
```

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

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

```
}
```

$$d = b^2 - 4ac;$$

if ($d == 0$)

{

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

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

System.out.println("Root 1=Root 2=" + r1);

}

else if ($d > 0$)

{

$$r1 = ((-b) + (\text{Math.sqrt}(d))) / (\text{double})(2 * a);$$

$$r2 = ((-b) - (\text{Math.sqrt}(d))) / (\text{double})(2 * a);$$

System.out.println("Roots are real & distinct");

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

}

else if ($d < 0$)

{

System.out.println("Roots are imaginary");

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

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

System.out.println("Root 1=" + r1 + " + i " + re);

System.out.println("Root 2=" + r1 + " - " + re);

}

}

Clos



```
class QuadraticMain
```

{

```
public static void main (String args [])
```

{

```
Quadratic q = new Quadratic ();
```

```
q.getd();
```

```
q.compute ();
```

}

}

O/p

①

Enter the coefficients of a, b, c

2 3 : 4

Roots are Imaginary

Root1 = 0.0 + i 1.198957

Root2 = 0.0 - i 1.198957

②

Enter the coefficients of a, b, c

5 0 0

Roots are real and equal

Root1 = Root2 = 0.0

③

Enter the coefficients a, b, c

0 0 0

Not a quadratic equation

Enter a non zero value of a :

Roots are ~~real~~ real and equal

Root1 = Root2 = 0.0

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10
12/12/23