

Lab Program 1

- Java program for printing all real solutions to QE $ax^2 + bx + c = 0$. a, b, c & use the quadratic formula i.e. If discriminant is -ve, display a message saying 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 coefficients  
a, b, c ");
```

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

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

```
}
```

12821
while
int n

rem = n / 10
n = n / 10

7

```
void compute()
```

```
{
```

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

```
{
```

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

```
    System.out.println ("Enter nonzero a:");
```

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

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

$$d = b^2 - 4 * a * c;$$

```
    if (d == 0)
```

```
{
```

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

```
    System.out.println ("Roots are real and  
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 ("Root 1 = " + r1 + "Root 2 = " + r2);
```

```
}
```

```

else if (d < 0)
{
    System.out.println (" Roots are imaginary ");
    r1 = (-b) / (2 * a);
    r2 = Math.sqrt (-d) / (2 * a);
    System.out.println (" Root1 = " + r1 + " + i " + r2);
    System.out.println (" Root2 = " + r1 + " - i " + r2);
}

class Quadratic Main
{
    public static void main (String args [])
    {
        Quadratic q = new Quadratic ();
        q.getd ();
        q.compute ();
    }
}

```

OUTPUT : ① Enter the coefficients : 3 4 5

~~Roots are imaginary~~

Root 1 = 0.0 + i 1.1055415967851332

~~Root~~ Root 2 = 0.0 - i 1.1055415967851332

② Enter the Coefficients : 1 2 1

Roots are real and equal

Root 1 = Root 2 = -1.0

③ Enter the coefficients: 0 1 2

Not a quadratic equation
enter a different value of $a(b)$ > 0

④ Enter the coefficients: 1 5 6

Roots are real & equal

$$\text{Root 1} = 2.0$$

$$\text{Root 2} = -3.0$$