

Lab 1

Develop a java program that prints all real ~~conversions~~ solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If discriminant is -ve display a message 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 coefficients  
of a, b, c");
```

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

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

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

```
    }
```

```
    void compute()
```

```
    {
```

Date: YOUVA
`while (a == 0)`

`{`

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

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

`Scanner s = 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 & equal");`

`System.out.println("Root 1 = Root 2 = " + 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 & 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("Roots are imaginary");
 $g1 = (-b) / (2 * a)$~~

System.out.println("Root 1 = " + g1 + " + i"
 + g2);

System.out.println("Root 2 = " + g1 + " - i"
 + g2);

}

}

}

class QuadraticMain

{

public static void main (String args[])
 {

Quadratic q = new Quadratic();

q.getd();

q.compute();

}

}

Output :

① Enter the coefficients of a, b, c :

3

4

5

Roots are imaginary

$$\text{Root 1} = 0.0 + i \cdot 1.1055$$

$$\text{Root 2} = 0.0 + i \cdot 1.1055$$

② Enter the coefficients of a, b, c :

1

2

1

Roots are real and equal

$$\text{Root 1} = \text{Root 2} = -1.0$$

③ Enter the coefficients of a, b, c :

1

5

6

Roots are real and distinct

$$\text{Root 1} = -2.0 \quad \text{Root 2} = -3.0$$

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✓

12/12/23