

18/11/22

Lab-1

Quadratic Equation

```
import java.math.*;
import java.util.Scanner;
```

```
class Quad
{
```

```
    public static void main (String arr[])
    {
```

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

```
        System.out.println ("Enter the coefficients a, b, c:");
```

```
        double a = s.nextDouble();
```

```
        double b = s.nextDouble();
```

```
        double c = s.nextDouble();
```

```
        double d, res1, res2;
```

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

```
        if (a == 0) { System.out.println ("Invalid input for a"); } else {
```

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

```
            {
```

```
                System.out.println ("The roots are real and
                    distinct :);
```

```
                res1 = -b + (Math.sqrt(d)) / (2*a);
```

```
                res2 = -b - (Math.sqrt(d)) / (2*a);
```

```
                System.out.println ("The roots are: " + res1 + " " + res2);
```

```
            }
```

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

```
        {
```

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

```
            res1 = res2 = -b / (2*a);
```

```
            System.out.println ("Roots are r1 = r2 = " + res1);
```

```
        }
```

```
    else { r1 = -b / (2*a); r2 = (Math.sqrt(Math.abs(d))) / (2*a);
```

```
        System.out.println ("No Real Solutions"); }
```

```
        System.out.println (r1 + " + i " + r2 + "\n" + r2 + " - i " + r1);
```

```
    }
```

Output

1) Enter the coefficients a, b, c

0

2

3

Invalid Input for a

2) Enter the coefficients a, b, c

1

2

1

The roots are real and equal

Roots are $r_1 = r_2 = -1.0$

3) Enter the coefficients a, b, c

1

5

1

The roots are real and distinct

The roots are: -0.2087121

-4.7912878474

4) Enter the coefficients a, b, c

1

2

3

The roots have no real solution and are imaginary

$-1.0 + i1.4142135623730951$

$1.4142135623730951 - i1.4142135623730951$

✓ ~~solu~~ solution

Command Prompt

```
2
3
The roots have no real solution and are imaginary
-1.0+1i.4142135623730951
1.4142135623730951-1i.4142135623730951
C:\Users\bmsce\Desktop\Aryan>java Quad
Enter the coefficients a,b,c
0
1
2
Invalid input for a
C:\Users\bmsce\Desktop\Aryan>java Quad
Enter the coefficients a,b,c
1
4
1
The roots are real and distinct
The roots are: -0.2679491924311228 -3.732050807568877
C:\Users\bmsce\Desktop\Aryan>java Quad
Enter the coefficients a,b,c
1
2
The roots are real and equal
Roots are r1=r2=-1.0
C:\Users\bmsce\Desktop\Aryan>
```

Activate Windows
Go to Settings to activate Windows.

Windows taskbar showing search bar, taskbar icons (Chrome, Edge, File Explorer, Mail, Calendar, Task View, Chrome), system tray (24°C Mostly sunny, ENG, 01:06 PM 18-11-2022).