

12/12/23

Lab Program 1:

CXA-12-12-23

5) Quadratic formula

```

import java.util.Scanner;
class Quadratic {
    int a, b, c;
    double r1, r2, d;
    void getdata()

    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()
    {
        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 and 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 and distinct");
    System.out.println("Root1 = " + r1 + " Root2 = " + 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("Root1 = " + r1 + " - i " + r2);
}
}

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
1 2 3

Roots are imaginary

$$\text{Root 1} = -1.0 + i 1.4142135623730951$$

$$\text{Root 2} = -1.0 + -i 1.4142135623730951$$

② Enter the coefficients of a, b, c
1 -4 4

Roots are real and equal

$$\text{Root 1} = \text{Root 2} = 2.0$$

③ Enter the coefficients of a, b, c
5 6 1

Roots are real and distinct

$$\text{Root 1} = -0.2 \text{ Root 2} = -1.0$$