

Lab programs.

- ① → develop a java program that prints all real solⁿ to the quadratic $ax^2+bx+c=0$, read a, b & c & use the quadratic formula. If discriminant b^2-4ac is negative, display a message stating that there are no real solⁿs.

```
import java.util.Scanner;
class Quadratic
{
    int a, b, c;
    double x1, x2, d;
    void getd()
    {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter coefficients a, b, c");
        a = s.nextInt();
        b = s.nextInt();
        c = s.nextInt();
    }
    void compute()
    {
        while(a == 0)
        {
            System.out.println("Not a Quadratic eqn");
            System.out.println("Enter a non zero");
            Scanner s = new Scanner(System.in);
            a = s.nextInt();
        }
        d = b*b - 4*a*c;
        if (d == 0)
        {
            x1 = (-b)/(2*a);
        }
    }
}
```

```

        System.out.println("Roots are real and equal");
        System.out.println("Root1 = Root2 = " + 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("Root2 = " + r1 + " - i" + r2);
    }
}
}
}
class QuadraticMain
{
    public static void main (String args[])
    {
        Quadratic q = new Quadratic();
        q.getd();
        q.compute();
        System.out.println("Done by : Santosh B,");
        USN : IBM72CS2H3");
    }
}

```

output:-

enter the coefficients of a, b, c:

3 4 5

Roots are imaginary

$$\text{Root1} = 0.0 + i1.1055415967851332$$

$$\text{Root2} = 1.1055415967851332 - i1.1055415967851332$$

Done by: Santosh B, USN: IBM22CS243

Enter the coefficients of a, b, c:

1 2 1

Roots are real and equal

$$\text{Root1} = \text{Root2} = -1.0$$

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Enter the coefficients of a, b, c:

1 4 1

Roots are real and distinct

$$\text{Root1} = -0.2679491924211228$$

$$\text{Root2} = -3.73205080757877$$

Done by: Santosh B, USN: IBM22CS243

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