29/9/2020

LAB PROGRAM-1.

Develop a Java Program that prints all the real solutions to the quadratic equations $ax^2+bx+c=0$. Read a, b, c and use the quadratic formula. If the discriminant b^2-4ac is negative, display a message stating that there are no real solutions.

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

class Quadratic
{
    public static void main()
    {
        float a, b, c, d;
        Scanner ss = new Scanner(System.in);
        System.out.println("Enter the value of 'a':");
        a = ss.nextFloat();
        System.out.println("Enter the value of 'b':");
        b = ss.nextFloat();
        System.out.println("Enter the value of 'c':");
        c = ss.nextFloat();
        calculate(a, b, c);
    }

    public static void calculate(float a, float b, float c)
    {   float d, r1, r2;
        if (a != 0)
        {
            float d;
            d = (b*b) - (4*a*c);
            if (d == 0)
            {
                System.out.println("Roots are real and
                                    equal");
```

```
        r1 = (-b) / (2 * a);
        r2 = r1;
        System.out.printf("Root 1 is : %.4f" + r1);
        System.out.printf("Root 2 is : %.4f" + r2);
    }
    else if (d > 0)
    {
        System.out.println("Roots are real and
                                unequal");
        r1 = ((-b) + Math.sqrt(d)) / (2 * a);
        r2 = ((-b) - Math.sqrt(d)) / (2 * a);
        System.out.printf("Root 1 is : %.4f" + r1);
        System.out.printf("Root 2 is : %.4f" + r2);
    }
    else
    {
        System.out.println("Roots are Imaginary");
    }
}
else
    System.out.println("The value of 'a' should
                        not be ZERO");
}
}
```

Algorithm

- Prompt the user for the inputs a, b, c
- Calculate the determinant 'd' if "a" is not zero.
- If "d" is equal to zero, then the roots are real and equal. If "d" is greater than zero, then roots are real and unequal else they are imaginary.
- Display appropriate messages and the roots.