

## LAB PROGRAM 1

→ Develop a java program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in  $a, b, c$  and use the quadratic formula. If the discriminant is  $b^2 - 4ac$  is negative, display a message stating 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() {
        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 & distinct");
    System.out.println("Root 1 = " + r1 + "Root2 = " + r2);
}

```

```

else if (d < 0) {
    System.out.println("There are no real solutions");
}

```

```

class QuadraticMain {
    public static void main (String[] args) {

```

```

        Quadratic q = new Quadratic();
        q.getd();

```

```

        q.compute();
        System.out.println("Adarsh Dev Singh - 1BH22CS011");
    }
}

```



:(Main)

(Start)

Declare quadratic object as q

get d() ← Run q.get d() function (method)

compute() ← Run q.compute() method

Print ("Adarsh Dev Singh - 1B422CS011")

(STOP)

class Quadratic

Declare int a, b, c & double r1, r2, d

void getd()

void compute()

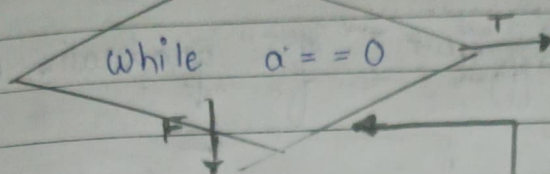
function void getd() →

Declare scanner object s

Print ("Enter the coefficient of quadratic a, b, c")

Read a, b and c from user

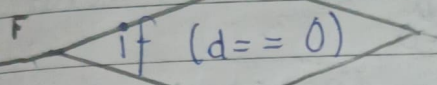
function void compute ()



/print("Not a Quadratic")/

print("Enter a non-zero  
value for a")

$$d = b * b - 4 * a * c$$



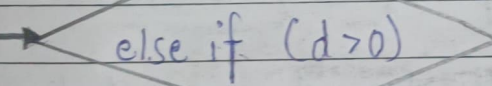
Declare a scanner  
object s

$$r1 = (-b) / (2 * a)$$

Read a from user

/print("Roots are real and distinct")/

/print("Root1 = Root2 = " + r1)/

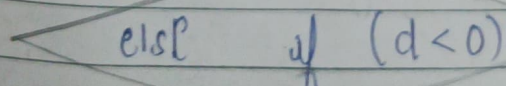


$$r1 = ((-b) + (\sqrt{d}) / (2 * a))$$

$$r2 = ((-b) - (\sqrt{d}) / (2 * a))$$

/print("Roots are real and distinct")/

/print("Root1 = " + r1 + "Root2 " + r2)/



/print("There are no real roots")/



→ Output :-

① Enter the coefficient of quadratic eqn  $a, b$  and  $c$

2

4

2

Two real and equal roots exist

$$\text{Root}_1 = \text{Root}_2 = -1.0$$

Adarsh Dev Singh - 1B22CS011

② Enter the coefficient of quadratic eqn  $a, b$  and  $c$

4

2

4

No real roots exist

Adarsh Dev Singh - 1B22CS011

③ Enter the coefficient of quadratic eqn  $a, b$  and  $c$

2

8

3

Two real and distinct roots exist

$$\text{Root}_1 = -0.4188611699 \quad \text{Root}_2 = -3.5811383$$

Adarsh Dev Singh - 1B22CS011

④ Enter the coefficient of quadratic eqn  $a, b$  and  $c$

0

1

2

Not a Quadratic Equation

Please Enter non zero value of  $a$