LAB PROGRAM 12/12/23 RA1,12-12-23

2) Develop a java program that prints all real solutions to the quadratic equations $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminate $b^2 - 4ac$ 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 and distinct");
        System.out.println("Root1 = "+r1+"Root 2 = "+r2);
    }
    else if(d<0)
    {
        System.out.println("Roots are imaginary");
        r1=(-b)/(2*a);
        r2=Math.sqrt(-d)/(2*a);
        System.out.println("Root 1 = "+r1+"+i"+r2);
        System.out.println("Root 1 = "+r1+"-i"+r2);
    }
  }
}

class QuadraticMain
{
    public static void main(String args[])
    {
        Quadratic q = new Quadratic();
```

```
        g.getd();
        g.compute();
        System.out.println("Sohan AR - 1BM22CS285");
    }
}
```

Output

1) Enter the coefficients of a, b, c

1
2
1

Root 1 = -1 Root 2 = -1

Roots are real and equal

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2) Enter the coefficients of a, b, c

1
4
1

Root 1 = -0.2679491924311227

Root 2 = -3.7320508075688773

Roots are Real and distinct

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3) Enter the coefficients of a, b, c

4
1
1

Roots are imaginary

Root 1 = 0.0 + i0.48412291827592711

Root 2 = 0.0 - i0.48412291827592711

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