Lab

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(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 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 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("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("Root 1 =" + 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 + "+" + r2 + "i");
    System.out.println("Root1 =" + r1 + "-" + r2 + "i");
}
}
}

Class QuadraticMain
{
    public static void main(String args[])
    {
        Quadratic qr = new quadratic();
        qr.getd();
        qr.compute();
    }
System.out.println("Shashank Patel CJ IBM22CS255");
```

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Output:

① enter the coefficients of a, b, c
1 2 1
roots are real and equal
root1 = root2 = -1.0

② enter the coefficients of a, b, c
2 4 5
roots are imaginary
root1 = -1.0 + i 1.2247448713915889
root1 = -1.0 - i 1.2247448713915889

③ enter the coefficients of a, b, c
1 4 1
roots are real and distinct
root1 = -0.2679491924311228
root2 = -3.7320508075688772

Shashank Patel CJ 1BM22CS255

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