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DATE 09/10/2024

Lab Program 1

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

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```
import java.util.Scanner;

public class QuadraticEquations {

    public static void main(String a[]){

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a: ");
        double a = scanner.nextDouble();
        System.out.print("Enter b: ");
        double b = scanner.nextDouble();
        System.out.print("Enter c: ");
        double c = scanner.nextDouble();

        double d = b*b - 4*a*c;

        if (d>0){
            double root1 = (-b+ Math.sqrt(d))/2*a);
            double root2 = (-b - Math.sqrt(d)/2*a);

            System.out.println("Real Roots");
            System.out.println("Root1: " + root1);
            System.out.println("Root2:" + root2);
        }
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```
else if (d==0){
    double root root1 = -b/(2*d);
    System.out.println("Roots are Real and Equal");
    System.out.println("Root 1 and 2:" + root1);
}

else{
    System.out.println("Roots are Complex");
}

scanner.close();
}
}
```

Output

→ Enter a: 12

Enter b: 10

Enter c: 9

Roots are Complex

→ Enter a: 2

Enter b: 4

Enter c: 2

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Roots are real and equal

Root : -1.0

→ Enter a: 2

Enter b: 8

Enter c: 2

Real Roots

Root 1: -0.27

Root 2: -3.73

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