

LAB 1 Saughamitra R - IBM22CS237

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 $b^2 - 4ac$ 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 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 + "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();
```

```
        q.getD();
```

```
        q.compute();
```

```
}
```

```
}
```


OUTPUT:

Enter the co-efficients of a, b, c :

1

2

1

Roots are real and equal.

Root 1 = Root 2 = -1.0

Enter coefficients of a, b, c :

1

5

6

Roots are real and distinct

Root 1 = -2.0 Root 2 = -3.0

Enter coefficients of a, b, c :

3

4

5

Roots are imaginary

Root 1 = 0.0 + i 1.1055415967851332

Root 2 = 0.0 - i 1.1055415967851332

Sanghamitra R - IBM 22CS237

Done
12/12/23