

Develop a java program that prints all real solutions to the quadratic equation  $ax^2+bx+c$  and use quadratic formula. If discriminant  $b^2-4ac$  is negative, display a message stating that there is no real solution.

```
import java.util.Scanner;

class QuadraticEquations
{
    public static void main(String args[]){
        Scanner input=new Scanner(System.in);

        System.out.println("Enter the value of a:");
        double a=input.nextDouble();

        System.out.println("Enter the value of b:");
        double b=input.nextDouble();

        System.out.println("Enter the value of c:");
        double c=input.nextDouble();

        if(a==0)
        {
            System.out.println("Invalid input");
        }
        else
        {
            double d=(b*b)-(4*a*c);
            if(d>0)
            {
                double r1=(-b+Math.sqrt(d))/(2*a);
                double r2=(-b-Math.sqrt(d))/(2*a);
                System.out.println("The roots are real and distinct: "+r1+" " and "+r2);
            }
            else if(d==0)
            {
                double r1=(-b/(2*a));
                System.out.println("The roots are real and equal: "+r1+" " and "+r1);
            }
        }
    }
}
```

```

        else
        {
            double r1=-b/(2*a);
            double r2=Math.sqrt(Math.abs(d))/(2*a);
            System.out.println("The roots are distinct and imaginary"+" r1= "+r1+" +i "+r2 +" r2=
"+r1+" -i "+r2);
        }
    }
}
}
}

```

## OUTPUT

```

C:\Users\BMSCECSE\Desktop\1BM21CS253>javac Quadraticequations.java
C:\Users\BMSCECSE\Desktop\1BM21CS253>java Quadraticequations
Enter the value of a:
2
Enter the value of b:
5
Enter the value of c:
1
The roots are real and distinct: -0.21922359359558485 and -2.2807764064044154
C:\Users\BMSCECSE\Desktop\1BM21CS253>java Quadraticequations
Enter the value of a:
2
Enter the value of b:
4
Enter the value of c:
2
The roots are real and equal: -1.0 and -1.0
C:\Users\BMSCECSE\Desktop\1BM21CS253>java Quadraticequations
Enter the value of a:
1
Enter the value of b:
2
Enter the value of c:
3
The roots are distinct and imaginary r1= -1.0 +i 1.4142135623730951 r2= -1.0 -i 1.4142135623730951
C:\Users\BMSCECSE\Desktop\1BM21CS253>java Quadraticequations
Enter the value of a:
0
Enter the value of b:
1
Enter the value of c:
2
Invalid input
C:\Users\BMSCECSE\Desktop\1BM21CS253>

```