PROGRAM

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 -4acmis negative, display a message stating that there is no real solution.

CODE

```
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(a+" "+b+" "+c+" "+d);
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);
}
}//else
}
}
```

OUTPUT

Command Prompt

```
C:\Users\BMSCEECE\Desktop\CS255>javac Quadraticequations.java

C:\Users\BMSCEECE\Desktop\CS255>java Quadraticequations
 Enter the value of a:
0
 Enter the value of b:
1
 Enter the value of c:
2
invalid input

C:\Users\BMSCEECE\Desktop\CS255>javac Quadraticequations.java

C:\Users\BMSCEECE\Desktop\CS255>java Quadraticequations
 Enter the value of a:
2
 Enter the value of b:
4
 Enter the value of c:
2
2.0 4.0 2.0 0.0
The roots are real and equal-1.0and-1.0

C:\Users\BMSCEECE\Desktop\CS255>javac Quadraticequations.java

C:\Users\BMSCEECE\Desktop\CS255>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 imaginaryr1=-1.0+i1.4142135623730951r2=-1.0-i1.4142135623730951

C:\Users\BMSCEECE\Desktop\CS255>javac Quadraticequations.java

C:\Users\BMSCEECE\Desktop\CS255>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-0.21922359359558485and-2.2807764064044154

C:\Users\BMSCEECE\Desktop\CS255>
```