Program 1

Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2 -4ac is negative, display a message stating that there are no real solutions.

Code:

```java
import java.util.Scanner;
class quadraticequation
{
  public static void main(String args[])
  {
    Scanner S = new Scanner(System.in);
    System.out.println("Enter the values of a b and
    c");  double a,b,c,d,r1,r2;  a=S.nextFloat();
    if(a==0)
    {
      System.out.println("invalid input");
    }
    else
    {
     b=S.nextFloat();
     c=S.nextFloat();  d=(b*b)-
     (4*a*c);

     if(d>0)
     {
        r1=(-b+Math.pow(d,0.5))/(2*a);  r2=(-b-
        Math.pow(d,0.5))/(2*a);

        System.out.println(" Roots are Real and Distinct and The values are:  " + r1 + "and" +
r2);
     }
        else if(d==0)
         {
        r1=-b/(2*a);
           System.out.println("Roots are Equal and the values are " + r1);
         }
    else
        {
```

```
        r1=-b/(2*a);
        r2=(Math.sqrt(Math.abs(d)))/(2*a);
           System.out.println("Roots are not real and the values are " + r1 + "+i" +Math.abs(r2)+
"and" + r1+ "-i" +Math.abs(r2));
        }
    }
  }


}
```

Observation:

PROGRAM - 1   18/11/22

QUADRATIC EQUATIONS

import java.util.Scanner;
~~import java.util.Scanner~~

class Quadratic equation
{

Public static void main (String args[])
{

Scanner S = new Scanner (System.in);
System.out.Println ("Enter the values a b and c");
double
~~false~~ a.b.c.d , r₁,r₂;

a = S.next Float ();
if (a==0) { System.out.Println ("invalid input") ; }
else { b = S.next Float();

C = S.next Float();
d = (b*b) - (4 * a * c);

if (d>0)
{
    r₁ = (-b + sqrt (d)) / (2 * d);
    r₂ = (-b - sqrt(d)) / (2 * d);

System.out.Println (" Roots are ᵥ"+ r1 + "and" + r₂);
else if (d==0)   real and distinct. The values are
{
    r₁ = - b / (2 * a);
```

system.out. Println (" Roots are equal and value
                              is " + r1 );

}
else {
    r1 = b/(2*a);
    r2 = (Math.sqrt (Math.abs (d)))/(2*a);
    System.out. Println (" Roots are not real and the
        values are " + r1 + "+i" + Maths.abs(r2) + "and" + r1
        "-i" + Maths. abs (r2)); { } } }
Output:

Enter the values of a b and c

2 4 2

Roots are Equal and the values are -1

Enter the values of a b and c

1 5 6

Roots are Real and Distinct and the values are
    -2 and -3.

Enter the values of a b and c

1 2 3

Roots are not Real
```

Output: