Lab Program 1:

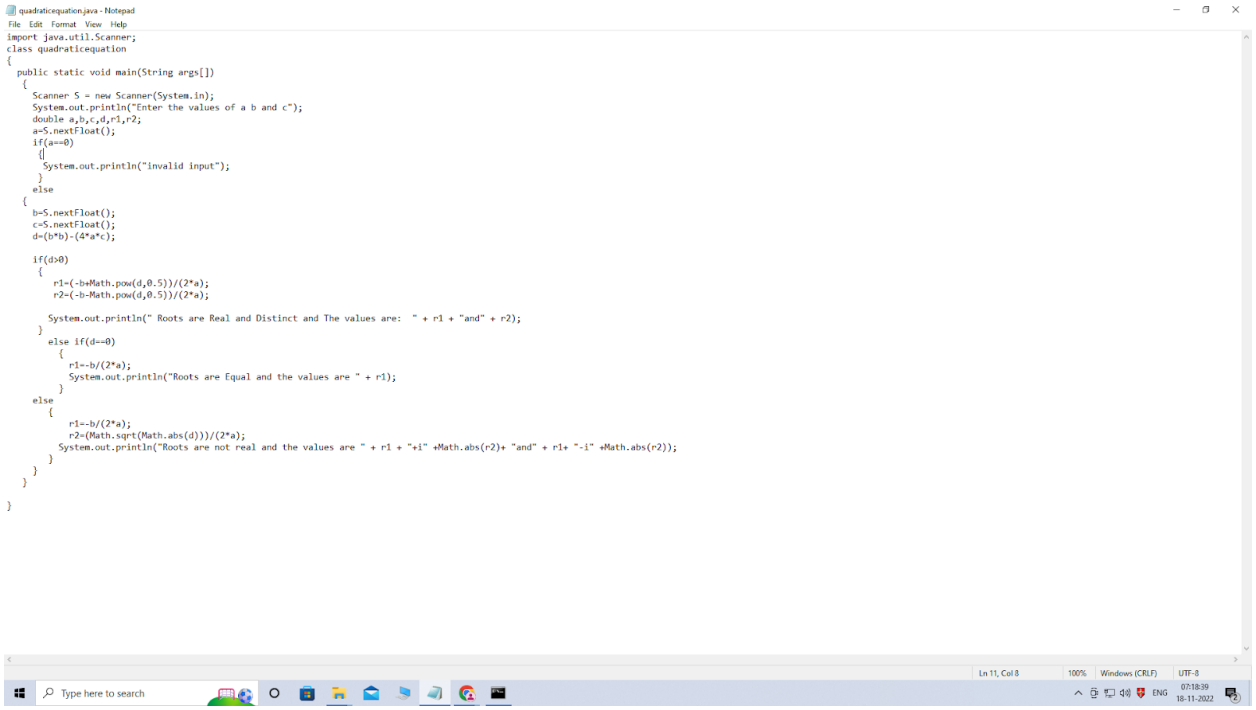
Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2
-4ac is negative, display a message stating that there are no
real solutions.

Code:

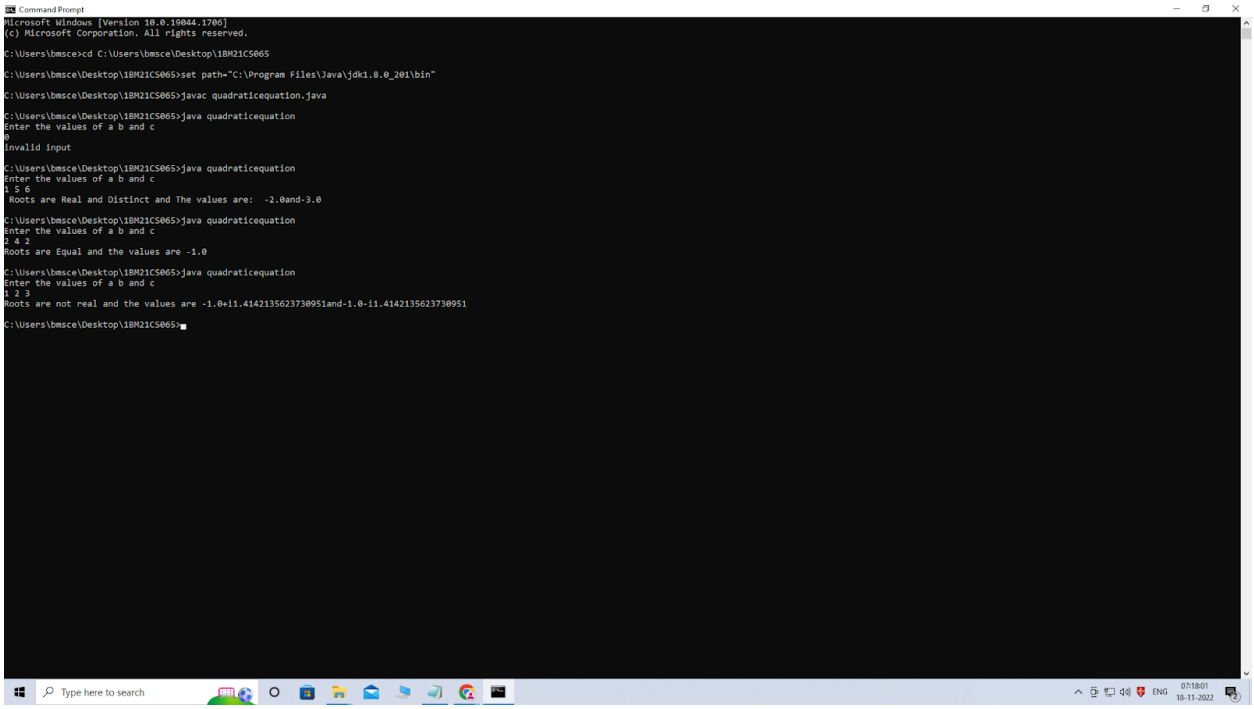
```
import java.util.Scanner;
class quadraticequation
{
  public static void main(String args[])
   {
     Scanner S = new Scanner(System.in);
     System.out.println("Enter the values of a b and c");
     double a,b,c,d,r1,r2;
     a=S.nextFloat();
     if(a==0)
      {
       System.out.println("invalid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

}
```

Screenshot of code:



Output:



Observation:

18/11/22

PROGRAM - 1

QUADRATIC EQUATIONS

```
import java.util.Scanner;
import java.util.Scanner
class Quadraticequation
{
  Public static void main (String args[])
  {
    Scanner S = new Scanner (System.in);
    System.out.Println ("Enter the values a b and c");
    double
    float 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 + sqrt(d)) / (2*d);
    r2 = (-b - sqrt(d)) / (2*d);
  System.out.Println ("Roots are"+ 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

Reviewed
18/11/2022