LAB 1

Q.

Develop a Java program that prints all real solutions to the quadratic equation

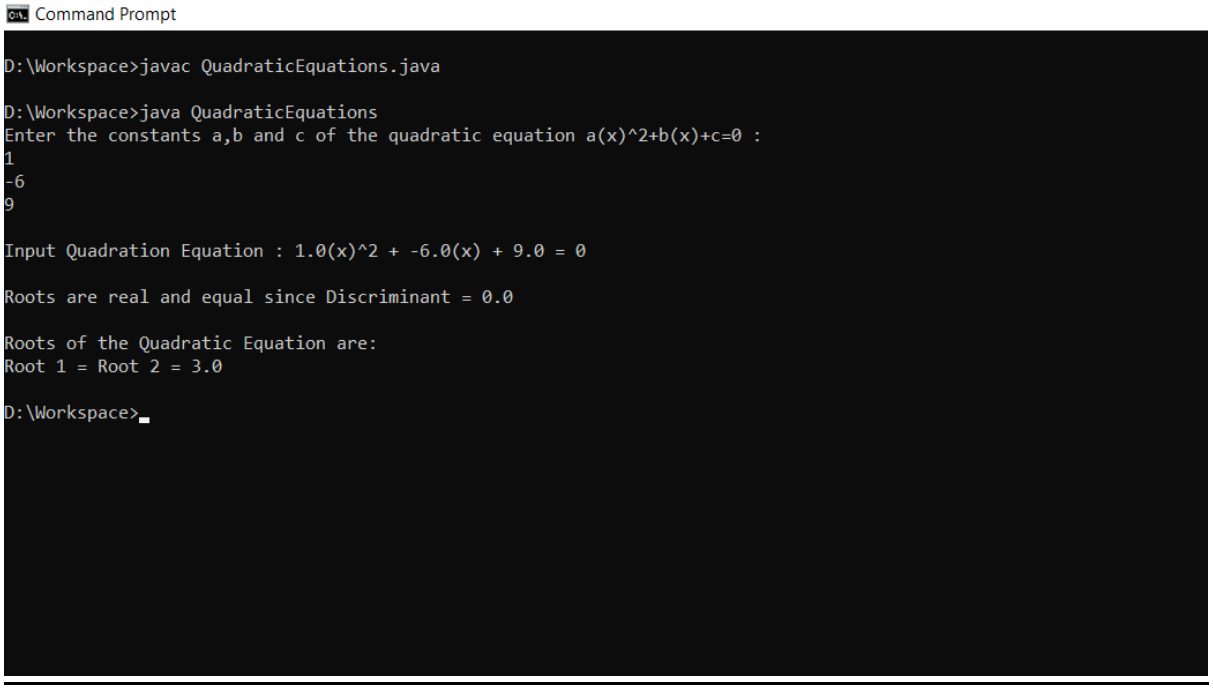
ax2 +bx+c= 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

A.

```
import java.util.Scanner;
class QuadraticEquations
{
	public static void main(String args[])
	{
		double a,b,c,D;
		double r1,r2;
		double real_part,imaginary_part;

		Scanner in = new Scanner(System.in);

		System.out.println("Enter the constants a,b and c of the quadratic equation a(x)^2+b(x)+c=0 : ");
		a = in.nextDouble();
		b = in.nextDouble();
		c = in.nextDouble();
		System.out.println("\nInput Quadration Equation : "+a+"(x)^2 + "+b+"(x) + "+c+" = 0");

		D = (b*b)-(4*a*c);
```

```
                if(D>0)
                {
                        System.out.println("\nRoots are real and unequal since Discriminant =
"+D);
                        r1 = (-b + Math.sqrt(D))/(2*a);
                        r2 = (-b - Math.sqrt(D))/(2*a);
                        System.out.println("\nRoots of the Quadratic Equation are:\nRoot 1 =
"+r1+"\nRoot 2 = "+r2);
                }
                else if(D==0)
                {
                        System.out.println("\nRoots are real and equal since Discriminant =
"+D);
                        r1 = r2 = (-b)/(2*a);
                        System.out.println("\nRoots of the Quadratic Equation are:\nRoot 1 =
Root 2 = "+r1);
                }
                else
                {
                        System.out.println("\nRoots are unreal since Discriminant = "+D);
                        real_part = (-b)/(2*a);
                        imaginary_part = (Math.sqrt(-D))/(2*a);
                        System.out.println("\nRoots of the Quadratic Equation are:\nRoot 1 =
"+real_part+"+"+imaginary_part+"(i)\nRoot 2 = "+real_part+"-"+imaginary_part+"(i)");
                }

        }
}
```

OUTPUT


Command Prompt
D:\Workspace>javac QuadraticEquations.java
D:\Workspace>java QuadraticEquations
Enter the constants a,b and c of the quadratic equation a(x)^2+b(x)+c=0 :
1
-6
9
Input Quadration Equation : 1.0(x)^2 + -6.0(x) + 9.0 = 0
Roots are real and equal since Discriminant = 0.0
Roots of the Quadratic Equation are:
Root 1 = Root 2 = 3.0
D:\Workspace>