Roots of Quadratic equations

```java
import java.util.Scanner;
class roots {
    public static void main (String [] args) {
        Scanner s = new Scanner (System.in);
        System.out.println ("Enter three number");
        double   a = s.nextDouble();
        double   b = s.nextDouble();
        double   c = s.nextDouble();

        double   determinant = (b* b) - (4*a* c);
        double   sqrt = Math.sqrt (determinant);

        if (determinant > 0) {
            double firstroot = (-b+sqrt) / (2*a);
            double secondroot = (-b-sqrt) / (2*a);
            System.out.println ("Roots are different and real");
            System.out.printf ("Roots are = %.2f and %.2f",
                               firstroot, secondroot);

        } else if (determinant == 0) {
            System.out.println (" Roots are real & equal");
            System.out.printf (" Root is = %.2f", (-b+sqrt)/(2*a));

        } else {
            double realpart = -b/(2*a);
            double imaginarypart = Math.sqrt (determinant)/(2*a);
```

```
        System.out.println(" Roots are imaginary");
        System.out.printf("Root 1 = %.2f + %.2f i and
                    Root 2 = %.2f - %.2f i ",
                        realpart, imaginary part,
                        realpart, imaginary part);
    }
}
}
```

Algorithm

i] Input value a, b, c

ii] Calculate deter~~minant~~ minant = b*b - 4*a*c and
   sqroot of determinant.

iii]   if (determinant > 0)
        Roots are real & different
        r_1 = (-b + sqrt) / (2* a);
        r_2 = (-b - sqrt) / (2* a);

iv]. else if (determinant == 0)
        Roots are equal.
        r_1 = + (-b + sqrt) / (2*a);

iv]. else
        Roots are imaginary.
    Real part = - b / (2*a);
    imaginary part = Math. sqrt (-determinant) / (2*a)

iv) Root 1 = $4..2\partial + 1..2\partial i$;

Root 2 = $1..2\partial - 1..2\partial i$

v] Print R₁ & R₂.

vi] End.

```
Administrator: Command Prompt

Microsoft Windows [Version 6.1.7601]
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C:\Users\shakti>cd C:\Program Files\Java\jdk1.8.0_261\bin\lab_2020

C:\Program Files\Java\jdk1.8.0_261\bin\lab_2020>javac roots.java

C:\Program Files\Java\jdk1.8.0_261\bin\lab_2020>java roots
Enter three number
2.3
4
5.6
Roots are imaginary
Root1 :-0.86956521739130441.2956229935435948iand Root2 :-0.8695652173913044-1.29
56229935435948i
Root1 = -0.87+1.30i and Root2 = -0.87-1.30i
C:\Program Files\Java\jdk1.8.0_261\bin\lab_2020>
```

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Project2.html   style1.css   array.java   roots.java   style.css   project1.html

```java
import java.util.Scanner;
class roots{
    public static void main(String[] args){
        Scanner s=new Scanner(System.in);
        System.out.println("Enter three number");
        double a=s.nextDouble();
        double b=s.nextDouble();
        double c=s.nextDouble();

        double determinant = (b*b)-(4*a*c);
        double sqrt = Math.sqrt(determinant);

        if(determinant>0){
            double firstroot = (-b+sqrt)/(2*a);
            double secondroot = (-b-sqrt)/(2*a);
            System.out.println("Roots are real and differnt");
            System.out.println("Roots are : "+ firstroot+ "and" + secondroot);
            System.out.printf("Roots are = %.2f and %.2f", firstroot, secondroot);

        }else if(determinant==0){
            System.out.println("Roots are real and equal");
            System.out.println("Root is : "+(-b+sqrt)/(2*a));
            System.out.printf("Root is = %.2f",(-b+sqrt)/(2*a));

        } else{
            double realpart = -b/(2*a);
            double imaginarypart = Math.sqrt(-determinant)/(2*a);
            System.out.println("Roots are imaginary");
            System.out.println("Root1 :"+ realpart + imaginarypart+"i" +"and Root2 :"+ realpart + "-"+imaginarypart+"i");
            System.out.printf("Root1 = %.2f+%.2fi and Root2 = %.2f-%.2fi", realpart, imaginarypart, realpart, imaginarypart);
        }
    }
}
```