

Algorithm

- step 1: Start
- step 2: Declare the required variables
- step 3: Indicate the user to enter the coefficients of the quadratic equation by displaying suitable sentences using `printf()` function.
- step 4: Taking input from user in put. a, b, c .
- step 5: if $(D > 0)$ $D = b^2 - 4 * a * c$.
- step 6: if $(D > 0)$
 roots are Real & distinct.
 roots are $(-b + \sqrt{D}) / (2 * a)$ and $(-b - \sqrt{D}) / (2 * a)$.
- else if $(D = 0)$
 printf equal roots & Real.
 root is $-b / (2 * a)$.
- else imaginary roots
 roots are $(-b + \sqrt{-D}) / (2 * a)$ and $(-b - \sqrt{-D}) / (2 * a)$.
- step 7: stop

Code :-

```
import java.util.*;
import java.lang.*;
class quadraticEquation {
    public static void main(String args[])
    {
        Scanner in = new Scanner(System.in);
        double a, b, c, d, root1, root2;
        System.out.println("Enter A, B and C");
        a = in.nextDouble();
        b = in.nextDouble();
        c = in.nextDouble();
        d = b*b - 4*a*c;
        if (d == 0)
            System.out.println("Roots are Real & similar \n\n Root is " + (-b)/(2*a));
        if (d > 0)
        {
            root1 = (-b + Math.sqrt(d)) / (2*a);
            root2 = (-b - Math.sqrt(d)) / (2*a);
            System.out.println("Roots are Real and distinct " + root1 + " and " + root2);
        }
        if (d < 0)
        {
            root1 = -b/(2*a);
            root2 = Math.sqrt(-d) / (2*a);
            System.out.println("Roots are imaginary " + root1 + " + " + root2 + " i and " + root1 + " - " + root2 + " i");
        }
    }
}
```