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LAB-3

① Write a java program to find roots of quadratic equation.

```
import java.util.scanner;
import static java.lang.math.*;
class quadratic
{
    public static void main (String args[])
    {
        quadratic obj = new quadratic();
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the value of a ::");
        float a = sc.nextFloat();
        System.out.println("Enter the value of b::");
        float b = sc.nextFloat();
        System.out.println("Enter the value of c ::");
        float c = sc.nextFloat();
        if(a==0)
        {
```

```java
        System.out.println ("Invalid");
        return;
    }

    float d = b*b - 4*a*c;
    float sqrt_val = (float)Math.sqrt (abs(d));
    float root1 = (-b + sqrt_val) / (2*a);
    float root2 = (-b + sqrt_val) / (2*a);
    if (d == 0)
    {
        System.out.println ("Roots are real and equal :: "+ root1);
    }
    else if (d > 0)
    {
        System.out.println ("Roots are real and different \n");
        System.out.println (root1 + "\n" + root2);
    }
    else
    {
        System.out.println ("Roots are complex \n");
        System.out.print (-b/(2*a) + "+i" + sqrt_val / (2*a) +
                    "\n" + -b/(2*a) + "-i" + sqrt_val/(2*a));
    }
}
```

* ALGORITHM :-

step1 : START

step 2 : Input the value of a, b, c.

step 3 : Calculate $d = b*b - 4*a*c$

step 4 : If $(d < 0)$ Display "Roots are imaginary", calculate $= (-b + sqrt-val)/2a$

and $r_2 = (-b - sqrt-val)/2a$. else if $(d > 0)$ Display "Roots

are equal" then calculate $r_1 = r_2 = (-b/2a)$.

step 5 : print r_1 and r_2.

step 6 : END.

→ Expected Output :-

Enter the value of a :: 3

Enter the value of b :: 2

Enter the value of c :: 2

Roots are complex

$-0.33333334 + i0.745356$

$-0.33333334 - i0.745356$