OOJ Lab-1

*) Develop a JAVA program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula. If the discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

→ Algorithm:-

1) START
2) Read a, b, c (coefficients of the quadratic equation)
3) Calculate $d = b^2-4ac$.
4) If (d==0)
   → Calculate r1(root1) = $\frac{(-b)}{2a}$
   → Calculate r2(root2) = $\frac{(-b)}{2a}$
   → Display real and equal roots (r1, r2)
5) else if (d > 0)
   → Calculate r1(root1) = $\frac{(-b+\sqrt{d})}{2a}$
   → Calculate r2(root2) = $\frac{(-b-\sqrt{d})}{2a}$
   → Display real and distinct roots (r1, r2)
6) else if (d < 0)
   → Display no real solution
7) STOP

→ Program :-

```
import java.util.Scanner;
import static java.lang.Math.sqrt;
class Lab1{
public static void main(String args[]){
Scanner ss = new Scanner(System.in);
double a,b,c,d,r1,r2;
int temp;
System.out.println("Enter the three co-efficients a, b, c of the quadratic equation");
a=ss.nextDouble();
b=ss.nextDouble();
c=ss.nextDouble();
d=((b*b)-(4*a*c));
if(d==0)
{
   temp=1;
}
else if(d>0)
   {
   temp=2;
}
```

```
else
    {
      temp = 3;
    }
switch (temp)
{
    case 1: System.out.println ("The roots are
            real and equal");
    r1=r2 = (-b/(2*a));
    System.out.println ("The roots are "+r1+"
     and "+r2+"");
     break;
case 2: System.out.println ("The roots are real
        and distinct");
     r1= (-b+ sqrt(d))/(2*a);
     r2= (-b - sqrt(d))/(2*a);
  System.out.println ("The roots are "+r1+"
     and "+r2+"");
     break;
case 3: System.out.println ("The roots are
imaginary, that is there are no real solutions to
given quadratic equation");
     break;
```

```
default : System.out.println("Invalid input");
          break;
    }
  }
}
```