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

Step 1 : Input the value of a, b and c.

Step 2 : Calculate d by using the formula :

```
d = (b*b) - (4*a*c)
```

Step 3 :

```
if (d < 0)
    print : No real solutions

else if (d == 0)
    print : Roots are equal
    print : r1 = r2 = (-b/2*a)

else
    print : Roots are real
    print : r1 = -b + √d/(2*a);
    print : r2 = -b - √d/(2*a);
```

Step 4 : End.

Program

```
import java.util.*;
public class QuadRoots
{
public static void main(String args[])
{
double a, b, c, d, r1, r2;
System.out.println("Enter the values of a, b and c");
Scanner sc = new Scanner(System.in);
a = sc.nextDouble();
b = sc.nextDouble();
c = sc.nextDouble();
d = (b*b) - (4*a*c);

if (d>0)
{
r1 = (-b + Math.sqrt(d))/(2*a);
r2 = (-b - Math.sqrt(d))/(2*a);
System.out.println("root1=" + r1 + "root2="
+ r2);
}
else if (d==0)
{
r1 = r2 = -b/(2*a);
System.out.println("root1 = root2 =" + r1);
}
```

```
else
  {
    System.out.println("There are no real solutions
                for the given equation");
      }

  }
}
```