

LAB PROGRAM-1

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 discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

Program:

```
import java.util.*;
import java.lang.String;
class equation
{
public static void main(String args[]){
double r1=0,r2=0;
Scanner root =new Scanner(System.in);
System.out.print("Enter the value of a in  $ax^2+bx+c=0$ :");
double a=root.nextDouble();
System.out.print("Enter the value of b of  $ax^2+bx+c=0$ :");
double b=root.nextDouble();
System.out.print("Enter the value of c  $ax^2+bx+c=0$ :");
double c=root.nextDouble();
double n=2*a;
double D=(b*b)-4*a*c;
if(D>0)
{
System.out.println("solutions real and distinct");
r1=(-b+ Math.sqrt(D))/n;
r2=(-b- Math.sqrt(D))/n;
System.out.println("solutions are");
System.out.println(r1);
System.out.println(r2);
}
else if(D==0)
{
System.out.println("solution real and equal");
r1=r2=-b/n;
System.out.println("solutions are");
System.out.println(r1);
System.out.println(r2);
}
```

```
}  
else  
{  
System.out.println("NO real solutions");  
}  
}  
}
```

OUTPUT:

```
Microsoft Windows [Version 10.0.18363.1082]  
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C:\Users\Divyanshu>cd java  
  
C:\Users\Divyanshu\java>javac labweek3.java  
  
C:\Users\Divyanshu\java>java labweek3  
Enter values of a,b,c of a quadratic eqn: 1 2 1  
Roots are Real and Equal: -1.0000 and -1.0000  
C:\Users\Divyanshu\java>java labweek3  
Enter values of a,b,c of a quadratic eqn: 2 3 1  
Roots are Real and Disinct: -0.5000 and -1.0000  
C:\Users\Divyanshu\java>java labweek3  
Enter values of a,b,c of a quadratic eqn: 2 3 5  
No real solutions!  
  
C:\Users\Divyanshu\java>_
```