

Lab Program 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.

```
import java.util.Scanner;

class QuadraticEquation
{
public static void main(String XX[])
{
double a;
double b;
double c;
double root1,root2;

Scanner SS=new Scanner(System.in);
System.out.print("Enter the values of a,b,c");
a=SS.nextDouble();
b=SS.nextDouble();
c=SS.nextDouble();
double determinant=b*b-4*a*c;
{
if(a==0)
System.out.print("It is not a quadratic equation");
else
{
if(determinant>0)
{
root1=(-b+Math.sqrt(determinant))/2*a);
root2=(-b-Math.sqrt(determinant))/2*a);
}
```

```
System.out.print("The roots are distinct and real:"+root1+"and "+root2);  
}  
if(determinant==0)  
{  
root1=root2=-b/2*a;  
System.out.print("The roots are equal:"+root1);  
}  
if(determinant<0)  
{  
root1=(-b+Math.abs(Math.sqrt(determinant)))/2*a;  
root2=(-b-Math.abs(Math.sqrt(determinant)))/2*a;  
System.out.print("the roots are imaginary:"+root1+" "+root2);  
}  
}  
}  
}
```

lab - program - 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.

```

→ import java.util.Scanner;
class QuadraticEquation
{
    public static void main (String args[])
    {
        double a;
        double b;
        double c;
        double root1, root2;
        Scanner ss = new Scanner(System.in);
        System.out.println("Enter the value of a, b, c");
        a = ss.nextDouble();
        b = ss.nextDouble();
        c = ss.nextDouble();
        double determinant = b*b - 4*a*c;
        {
            if (a == 0)
                System.out.println("It is not a quadratic equation");
            else
            {
                if (determinant > 0)
                {
                    root1 = ((-b + Math.sqrt(determinant)) / (2 * a));
                    root2 = ((-b - Math.sqrt(determinant)) / (2 * a));
                }
            }
        }
    }
}

```

```
System.out.println("The roots are distinct and real : " + root1  
+ " and " + root2);
```

```
}
```

```
if (determinant == 0)
```

```
{
```

```
root1 = root2 = -b/2*a;
```

```
System.out.println("The roots are distinct and real : " + root1 +  
" and " + root2);
```

```
}
```

```
if (determinant == 0)
```

```
{
```

```
root1 = root2 = -b/2*a;
```

```
System.out.println("The roots are equal : " + root1);
```

```
}
```

```
if (determinant < 0)
```

```
{
```

```
root1 = ((-b + Math.sqrt(determinant)) / 2*a);
```

```
root2 = ((-b - Math.sqrt(determinant)) / 2*a);
```

```
System.out.println("The roots are imaginary : " + "root1 +  
" + " i " + "root2");
```

```
}
```

```
}
```

```
}
```

```
}
```

```
}
```



```
Microsoft Windows [Version 10.0.22000.1098]
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C:\WINDOWS\system32>cd C:\Users\ACER\Documents

C:\Users\ACER\Documents>set path=C:\Program Files\Java\jdk-19\bin

C:\Users\ACER\Documents>javac QuadraticEquation.java

C:\Users\ACER\Documents>java QuadraticEquation
Enter the values of a,b,c22
18
10
the roots are imaginary:iNaN iNaN
C:\Users\ACER\Documents>java QuadraticEquation
Enter the values of a,b,c0
55
6
It is not a quadratic equation
C:\Users\ACER\Documents>-22
'-22' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\ACER\Documents>java QuadraticEquation
Enter the values of a,b,c2
4
6
the roots are imaginary:iNaN iNaN
C:\Users\ACER\Documents>
```