

Lab Program:

1. Develop a Java program that prints all real solutions to the quadratic equations $ax^2 + bx + c = 0$. 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;
```

```
public class QuadraticEquation {
```

```
    public static void main (String[] args) {  
        Scanner input = new Scanner (System.in);
```

```
        System.out.println("Enter the value of a");
```

```
        double a = input.nextDouble();
```

```
        System.out.println("Enter the value of b");
```

```
        double b = input.nextDouble();
```

```
        System.out.println("Enter the value of c");
```

```
        double c = input.nextDouble();
```

```
        double root1 = 0;
```

```
        double root2 = 0;
```

```
        double discriminant = b*b - (4*a*c);
```

```
        if (discriminant < 0) {
```

```
            System.out.println("The quadratic  
equation has imaginary roots.");
```

```
        }
```

```
if (discriminant == 0) {  
    System.out.println("The quadratic  
equation has real and equal roots.");
```

```
    root1 = -b / (2*a);
```

```
    root2 = -b / (2*a);
```

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

```
if (discriminant > 0) {  
    System.out.println("The quadratic  
equation has real and distinct roots");
```

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

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

```
    System.out.println("The roots are: \n  
Root1: " + root1 + "\n Root2: " + root2);  
}
```

```
}
```