Lab Program 1:

Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2
-4ac is negative, display a message stating that there are no
real solutions.

Code

```
import java.util.Scanner;
class quad
{
  public static void main(String xx[])
  {
    int a; int b; int c;
    double d;
    double r1,r2;
    Scanner s1=new Scanner(System.in);
    System.out.println("Enter the values of a,b,c");
    a=s1.nextInt();
    b=s1.nextInt();
    c=s1.nextInt();
    d=b*b-(4*a*c);
    if(a==0)
    {
      System.out.println("The equation is not quadratic.");
    }
    else if(d==0)
    {
      System.out.println("The roots are real and equal.");
      r1=-b/(2*a);
      System.out.println(r1);
    }
    else if (d>0)
    {
      System.out.println("The roots are real and distinct.");
      r1=(-b+Math.sqrt(d))/(2*a);
      r2=(-b-Math.sqrt(d))/(2*a);
      System.out.print(r1+","+r2);
    }
    else
    {
      System.out.println("The roots are imaginary.");
      r1=-b/(2*a);
      r2=Math.sqrt(Math.abs(d));
      System.out.println("the roots are"+" "+r1+"+"+"i"+"*"+r2+"and"+r1+"-"+"i"+"*"+r2);
    }
  }
}
```

Output

```
C:\Users\bmsce\Desktop\1BM21CS017>javac quad.java

C:\Users\bmsce\Desktop\1BM21CS017>java quad
Enter the values of a,b,c
0 2 3
The equation is not quadratic.

C:\Users\bmsce\Desktop\1BM21CS017>java quad
Enter the values of a,b,c
3 -18 27
The roots are real and equal.
3.0

C:\Users\bmsce\Desktop\1BM21CS017>java quad
Enter the values of a,b,c
1 -1 -6
The roots are real and distinct.
3.0,-2.0
C:\Users\bmsce\Desktop\1BM21CS017>java quad
Enter the values of a,b,c
1 -2 5
The roots are imaginary.
the roots are 1.0+i*2.0and1.0-i*2.0
```