Lab Program 1:

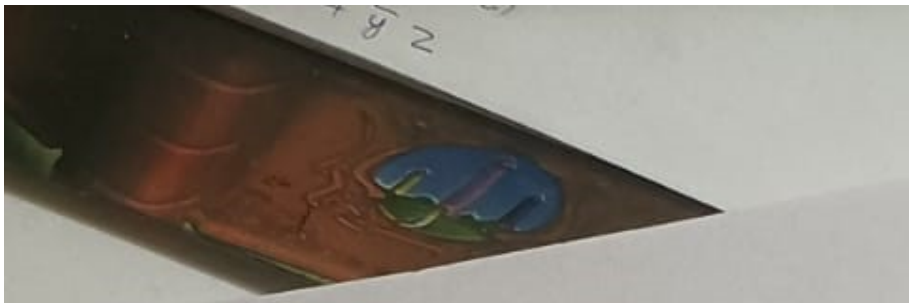
Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2 -4ac is negative, display a message stating that there are no real solutions.

SOURCE CODE:

```
import java.util.*;
import java.lang.*;
class box
{
 public static void main (String args[])
 {
  System.out.println("Enter the coefficients of quadrartic equation");
  Scanner sc= new Scanner(System.in);
  double a=sc.nextDouble();
  double b=sc.nextDouble();
  double c=sc.nextDouble();
  double d=(b*b)-(4*a*c);
  double r1;
  double r2;
  if(d>0)
  {
   r1=(-b+Math.sqrt(d))/(2*a);
   r2=(-b-Math.sqrt(d))/(2*a);
   System.out.println("Roots are real and distinct");
   System.out.println("The roots are r1="+r1+""+"and r2="+r2);
  }
 else if(d==0)
  {
```

```
    r1=r2=(-b)/(2*a);
    System.out.println("Roots are real and same");
    System.out.println("The roots are r1=r2="+""+r1);
  }
else
{
    r1=(-b)/(2*a);
    r2=(Math.sqrt(-d))/(2*a);
    System.out.println("Roots are imaginary and distinct");
    System.out.println("The roots are r1="+r1+"+i"+r2);
    System.out.println("The roots are r2="+r1+"-i"+r2);
}
}
}
```

WRITTEN CODE:



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Quadratic Equation

```
import java.util.*;
import java.lang.*;
Class bosc {
  public static void main (Stri
  {
    System.out.println("Enter

    Scanner sc = new Scann
    double a = sc.nextDouble
    double b = sc.nextDouble (
    double c = sc.nextDouble ()
    double d = (b*b) - (4*a* c
    double r1;
    double r2;
if (a!=0){
    if (d>0)
    {
      r1 = (-b+ Math.sqrt(d))
      r2 = (-b+ Math.sqrt(d))
      System.out.println("Roots are
      System.out.println("The re

    }
else if (d==0)
```

```
            System.out.println("Th
            System.out.println("Th
        }
    }
    else {
        System.out.println("Enter
    }
}
}
```

Output

1) Enter the coefficients of quadrati

Roots are real and equal
The roots are r1 = r2 = 1.

2) Enter the coefficients of quadra

Roots are imaginary and distinct
The roots are r1 = 0.5 + i
The roots are r2 = 0.5 -

OUTPUT (including test cases):