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9-1-24 Lab Programme 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 discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

```
import java.util.Scanner;
class Quadratic
{
  int a,b,c;
  double r1,r2,d;
  void getd()
  {
    Scanner s = new Scanner(System.in);
    System.out.println("Enter the
                    coefficients of a, b, c:");
    a=s.nextInt();
    b=s.nextInt();
    c=s.nextInt();
  }
  void compute()
  {
  while(a==0)
  {
   System.out.println("Not a quadratic
                              equation");
```

```
System.out.println("Enter a
        non zero value for a:");
Scanner s = new Scanner(System.in
a = s.nextInt();
}
d = b*b - 4*a*c;
if (d==0)
{
  r1 = (-b)/(2*a);
  System.out.println("Roots are real
                and equal");
  System.out.println("Root1 = Root2 = "+r1);
}
else if(d>0)
{
  r1 = ((-b)+(Math.sqrt(d)))/(double)(2*a);
  r2 = ((-b)-(Math.sqrt(d)))/(double)(2*a);
  System.out.println("Roots are real
                and distinct");
  System.out.println("Root1 = "+r1+" "+
                "Root2 = "+r2);
}
else if (d<0)
{
  System.out.println("Roots are
                imaginary");
  r1 = (-b)/(2*a);
  r2 = Math.sqrt(-d)/(2*a);
  System.out.println("Root1 = "+r1+"+i"+r2);
  System.out.println("Root2 = "+r1+"-i"+r2);
}
}
```

```
}

class QuadraticMain
{
  fulblic static void main(String args[])
  {
    Quadratic q = new Quadratic();
    q.getd();
    q.compute();
  }
}
```

Output:

1. Enter the coefficients of a, b, c:
1 2 3
Roots are imaginary
Root1 = -1.0 + i1.4142135623730951
Root2 = -1.0 - i1.4142135623730951

2. Enter the coefficients of a, b, c:
7 6 -9
Roots are real and distinct
Root1 = 0.7836116248912243 Root2 = -1.640754482034085

3. Enter the coefficients of a, b, c:
1 -8 16
Roots are real and equal
Root1 = Root2 = 4.0