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 Equation formula. If the discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

Program:

```
import java.util.Scanner;
import java.lang.Math;

public class QuadraticEquation {

public static void main (String args[]) {

float a,b,c,d;
double root1, root2;
Scanner s = new Scanner (System.in);
System.out.println ("Enter coefficients:");
a = s.nextFloat();
b = s.nextFloat();
c = s.nextFloat();

d = (b*b - (4*a*c));

if (a==0) {
System.out.println ("Not a quadratic equation");
}
else if (d>0) {
root1 = (-b+Math.sqrt(d))/(4*a*c);
root2 = (-b-Math.sqrt(d))/(4*a*c);
System.out.println ("Imaginary roots and distinct are:
" +root1+ "i" +"+" +root2+"i" and "+root1+"i"
+root2);

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

```
        root1 = root2 = -b/(2*a);
        System.out.println("Real roots are: " + root1 + " and "
                           + root2);
    }
}
}
```

Output:

1) Enter the coefficients:
   0
   5
   6
   Not a quadratic equation

2) Enter the coefficients:
   1
   10
   5
   Real and distinct roots are: -0.05278 and -0.94721

3) Enter the coefficients.
   1
   -4
   6
   Imaginary roots and distinct are 2.0+i-4.0 and
   2.0-i-4.0

4) Enter the coefficients
   2
   4
   2
   Real roots are: -1.0 and -1.0

Outputs:

```
C:\Users\bmsce\Desktop>java QuadraticEquation
Enter coefficients:
0
5
6
Not a quadratic equation
```

```
C:\Users\bmsce\Desktop>java QuadraticEquation
Enter coefficients:
1
10
5
Real and distinct roots are:-0.05278640450004204 and -0.947213595499958
```

```
C:\Users\bmsce\Desktop>java QuadraticEquation
Enter coefficients:
1
-4
6
Imaginary roots and distinct are:2.0+i-4.0 and 2.0-i-4.0
```

```
C:\Users\bmsce\Desktop>java QuadraticEquation
Enter coefficients:
2
4
2
Real roots are:-1.0and-1.0
```