Java Week-1

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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;
import java.lang.Math;
class QE
{
    Scanner s=new Scanner(System.in);
    int a,b,c;
    double d,r1,r2;
    void input()
    {
        System.out.println("Enter values of a,b,c:");
        a=s.nextInt();
        b=s.nextInt();
        c=s.nextInt();
    }
    void calculate()
    {
        if(a==0)
        {
            System.out.println("Not a Quadratic Equation\nEnter value of a:");
            a=s.nextInt();
        }
        d=(b*b)-(4*a*c);
        if(d<0)
```

```
            {
                System.out.println("Roots are imaginary");
                r1=(-b)/(2*a);
                r2=Math.sqrt(-d)/(double)(2*a);
                System.out.println("R1="+r1+" R2="+r2);
            }
            else if(d==0)
            {
                System.out.println("Roots are real and equal");
                r1=(-b)/(double)(2*a);
                r2=r1;
                System.out.println("R1="+r1+" R2="+r2);
            }
            else
            {
                System.out.println("Roots are real and distinct");
                r1=((-b)+(Math.sqrt(d)))/(double)(2*a);
                r1=((-b)-(Math.sqrt(d)))/(double)(2*a);
                System.out.println("R1="+r1+" R2="+r2);
            }
        }
}
class Quadratic
{
    public static void main(String a[]){
    QE q=new QE();
    System.out.println("Name: AKSHAY S");
    System.out.println("usn: 1BM23CS022");
    q.input();
    q.calculate();
}  }
```

Output:

```
D:\1BM23CS022 JAVA>javac Quadratic.java

D:\1BM23CS022 JAVA>java Quadratic
Name: AKSHAY S
usn: 1BM23CS022
Enter values of a,b,c:
10
20
5
Roots are real and distinct
R1=-1.7071067811865475 R2=0.0

D:\1BM23CS022 JAVA>java Quadratic
Name: AKSHAY S
usn: 1BM23CS022
Enter values of a,b,c:
5
3
1
Roots are imaginary
R1=0.0 R2=0.33166247903553997

D:\1BM23CS022 JAVA>java Quadratic
Name: AKSHAY S
usn: 1BM23CS022
Enter values of a,b,c:
4
4
1
Roots are real and equal
R1=-0.5 R2=-0.5
```