LAB PROGRAM 1

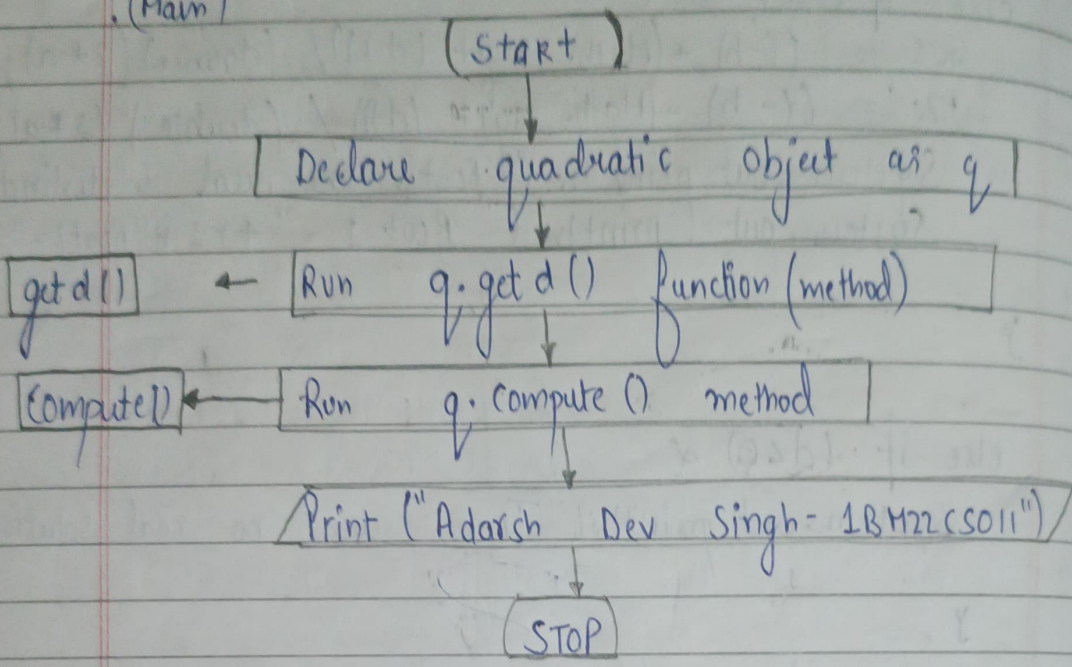
→ Develop a java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminate is $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

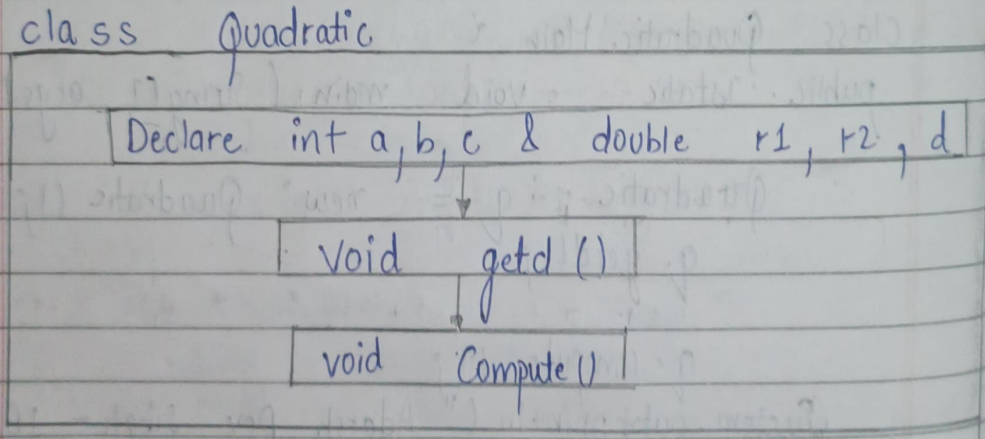
↦

```
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("Root 1 = Root 2 = " + r1);
        }
    }
```

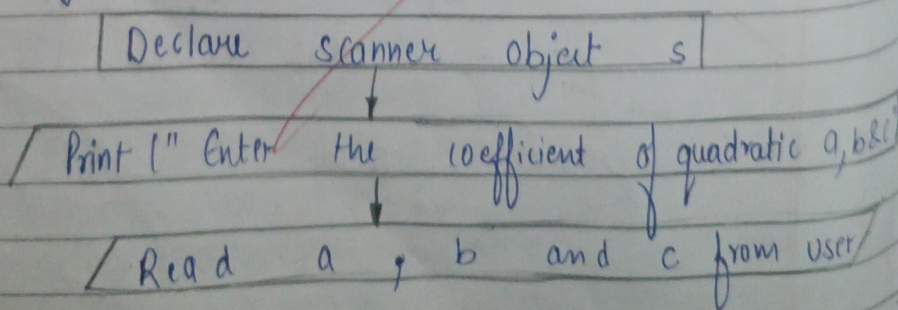
```
else if (d > 0) {
    r1 = ((-b) + (Math.sqrt(d)))/(double)(2*a);
    r2 = ((-b) - (Math.sqrt(d)))/(double)(2*a);
    System.out.println("Roots are real & distinct");
    System.out.println("Root 1 = " + r1 + "Root2 = " + r2);
}

else if (d<0) {
    System.out.println("There are no real solutions");
}
}

class Quadratic Main {
public static void main (String[] args) {
    Quadratic q = new Quadratic();
    q.getd();
    q.compute();
System.out.println("Adarsh Dev Singh - 1BH22CS011");
}
}
```

:(Main)

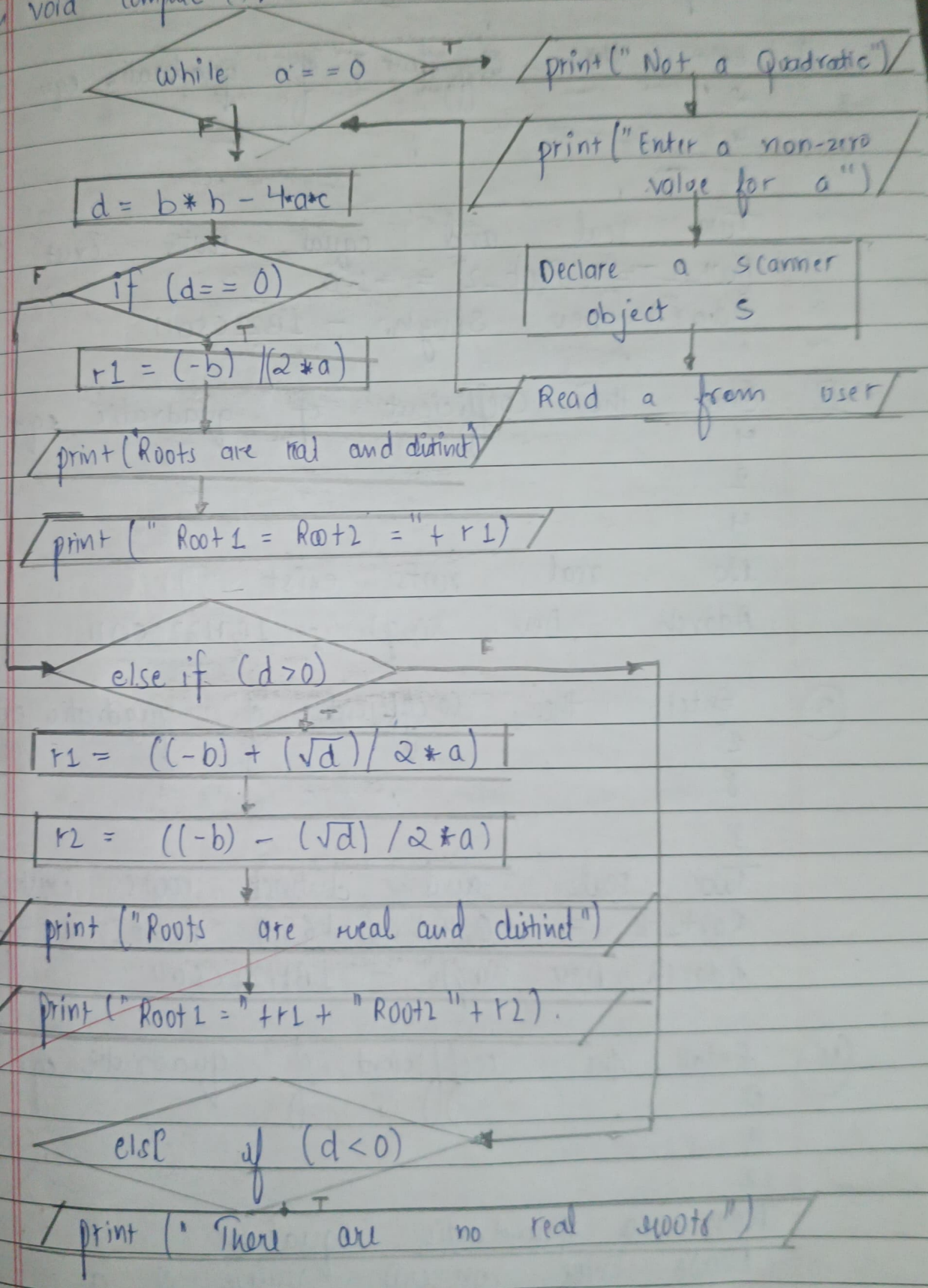




function void getd() →



function void compute ():



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→ Output :→

① Enter the coefficient of quadratic eqn a,b,c
2
4
2
Two real and equal roots exist
Root_1 = Root_2 = -1.0
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② Enter the coefficient of quadratic eqn a,b and c
4
2
4
No real roots exist
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③ Enter the coefficient of quadratic eqn a,b and c
2
8
3
Two real and distinct roots exist
Root_1 = -0.418861169 Root_2 = -3.581138831
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④ Enter the coefficient of quadratic eqn a,b and c
0
1
2
Not a Quadratic Equation
Please Enter non zero value of a