

* Print all real solutions to the quadratic equation. $ax^2 + bx + c = 0$.

```
import java.util.Scanner;  
public class quadratic
```

```
{
```

```
    public static void main (String [] args)
```

```
{
```

```
    Scanner input = new Scanner (System.in);  
    System.out.println ("Enter the first coefficient");
```

```
    int a = input.nextInt();
```

```
    System.out.println ("Enter the second coefficient");
```

```
    int b = input.nextInt();
```

```
    int D = b*b - 4*a*c;
```

```
    if (D > 0)
```

```
{  
    System.out.println ("The roots are  
    real & distinct");
```

```
    int r1 = (-b + Math.sqrt(D)) / (2*a);
```

```
    int r2 = (-b - Math.sqrt(D)) / (2*a);
```

```
    System.out.println ("r1 = " + r1);
```

```
    System.out.println ("r2 = " + r2);
```

```
}
```

```
    else if (D == 0)
```

```
{  
    System.out.println ("Roots are real &  
    equal");
```

```
    int r = -b / (2*a);
```

```
    System.out.println ("root = " + r);
```

```
}
```

else

system.out.println("Roots are imaginary");

}

}

Algorithm:

step 1: start

step 2: input a, b, c

step 3: if $a = 0$; print "invalid"

step 4: else $\text{det} = b^2 - 4 \times a \times c$

step 5: if $\text{det} > 0$

$$r_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$r_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

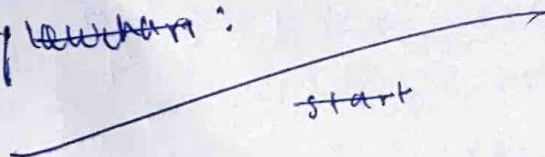
step 6: else if $\text{det} = 0$

$$r = -b/2a$$

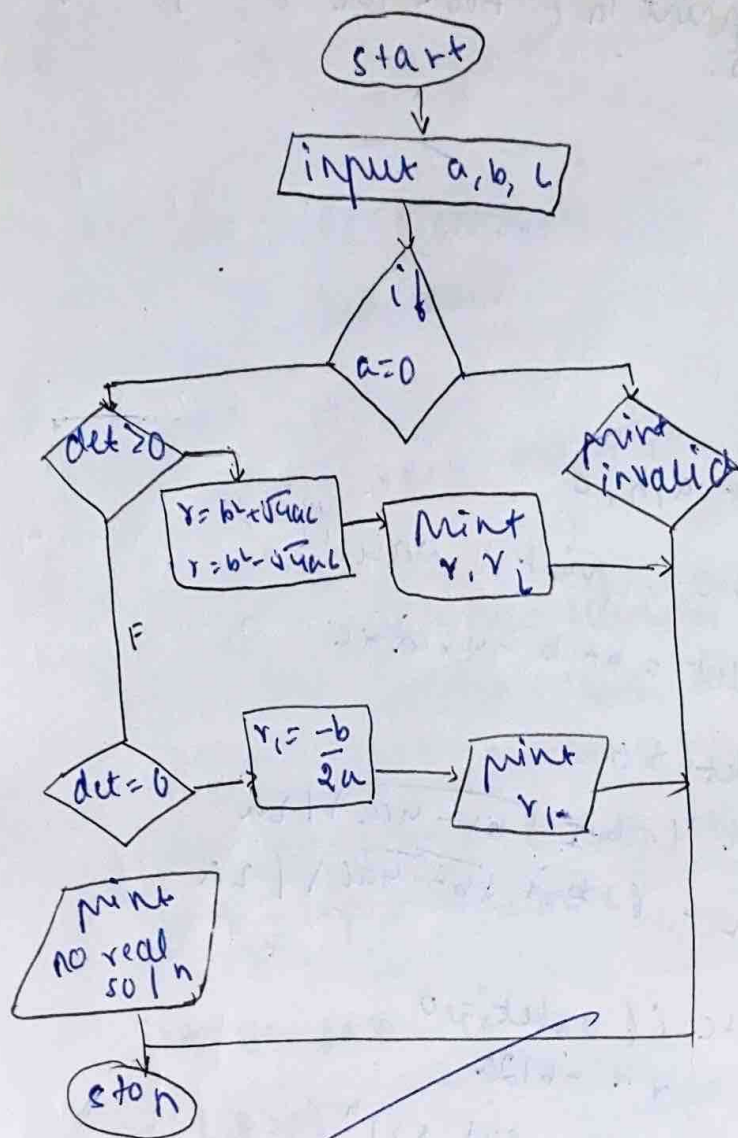
step 7: else: NO real soln

step 8: stop.

~~flowchart~~:



flowchart:



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