

<https://panchalprogrammingacademy.github.io/course-problem-deck/#!/problem/5fb264580f51d400177e5968>

# Roots of quadratic equation

50 POINTS

Given a quadratic equation find out the roots of the quadratic equation.

Note that if  $ax^2 + bx + c = 0$  is a quadratic equation with  $a$  being non-zero then roots of the equation can be computed as:

$$\text{roots} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

And based on the value of the discriminant i.e.  $D = \sqrt{b^2 - 4ac}$  we have the following cases:

1. If  $D = 0$  then roots are real and equal
2. If  $D > 0$  then roots are real and unequal
3. If  $D < 0$  then roots are imaginary

Input format:

A single line of input containing three integers denoting the values of  $a$ ,  $b$  and  $c$  respectively.

Output format:

Roots of the quadratic equation  $ax^2 + bx + c = 0$  separated by a space.

Constraints:

- (i)  $a$  is non-zero
- (ii)  $a$ ,  $b$ ,  $c$  are integers and it is guaranteed that there will be no overflow.

Test Case - 1

1 2 1

-1 -1

Explanation:

Given  $a = 1$ ,  $b = 2$  and  $c = 1$  we have the following equation:

$$x^2 + 2x + 1 = 0 \implies (x + 1)^2 = 0 \implies x = -1$$

Both the roots are real and equal

Test Case - 2

1 -5 6

3 2

Explanation:

Given  $a = 1$ ,  $b = -5$  and  $c = 6$  we have the following equation:

$$x^2 - 5x + 6 = 0 \implies (x - 3)(x - 2) = 0 \implies x = 3, 2$$

Both the roots are real and unequal

Test Case - 3

1 0 4

0+2i 0-2i

Explanation:

Given  $a = 1$ ,  $b = 0$  and  $c = 4$  we have the following equation:

$$x^2 + 4 = 0 \implies x^2 = -4 \implies x = \pm\sqrt{-4} \implies x = \pm 2i$$

NOTE:

- (i) use %g format specifier to print the resulting numbers.
- (ii) you need not to perform any complex number calculations just follow up the cases.

**Problem tags:**

THE COMPLETE C COURSE EASY IF-ELSE