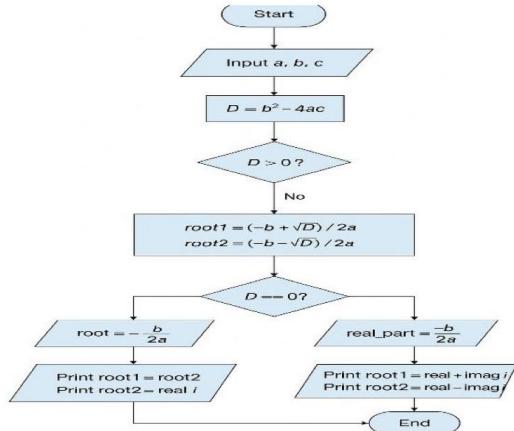


PROBLEM 2.1.1

Flowchart



Algorithm

Start

Input: Read three integers (a, b, and c) from a single line of input.

Calculate Discriminant: Compute D using the formula: $D = b^2 - 4ac$

- **If $D > 0$ (Real and Different):**
 - Calculate $\$root1 = \frac{-b + \sqrt{D}}{2a}$
 - Calculate $\$root2 = \frac{-b - \sqrt{D}}{2a}$
 - Print both roots.
 - **If $D = 0$ (Real and Same):**
 - Calculate the single root: $\$root = \frac{-b}{2a}$
 - Print that $root1 = root2$ equals this value.
 - **If $D < 0$ (Imaginary/Complex):**
 - Calculate the **Real Part**: $\$frac{-b}{2a}$
 - Calculate the **Imaginary Part**: $\$frac{\sqrt{-D}}{2a}$
 - Print the roots in the complex format (e.g., real + imaginary i).

Formatting: Ensure all printed values are formatted to exactly **two decimal places**.

Stop

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arjun.gahane.batch2025@sitnagpur.siu.edu.in [Support](#) [Logout](#)

2.1.1. Roots of a Quadratic Equation

Write a program to find the roots of a quadratic equation, given its coefficients a , b , and c . Use the quadratic formula:
$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The discriminant $D = b^2 - 4ac$ determines the nature of the roots:

- If $D > 0$: Roots are real and different
- If $D = 0$: Roots are real and the same
- If $D < 0$: Roots are imaginary

Input Format:

- Three space-separated integers representing the coefficients a , b , and c , respectively.

Output Format:

- If roots are real and different, print:

```
root1 = <Root1>
root2 = <Root2>
```
- If roots are the same, print:

```
root1 = root2 = <Root1>
```
- If roots are imaginary, print:

```
root1 = <RealPart>+<ImaginaryPart>i
```

Exercise: quadratic...

```
1 import math
2
3 a,b,c = map(float, input().split())
4
5 d=(b**2)-(4*a*c)
6
7 if d>0:
8     root1=(-b+math.sqrt(d))/(2*a)
9     root2=(-b-math.sqrt(d))/(2*a)
10    print("root1 = "+str(root1))
11    print("root2 = "+str(root2))
12
13 elif d==0:
14     print("root1 = "+str(-b/(2*a)))
15
16 else:
17     print("Imaginary Roots")
18
19 print("----- YOUR PROGRAM HAS ENDED -----")
```

1 -5
root1 = 3.00
root2 = 2.00
----- YOUR PROGRAM HAS ENDED -----