2.1.1 Roots of Quadratic Equation

ALGORITHM

Step 1:- Start

Step 2:- Import the math library.

Step 3:- Read three integers a, b, and c (coefficients of the quadratic equation).

Step 4:- Calculate the discriminant

$$D = b^2 - 4ac$$

Step 5:- . If D > 0:

Calculate two real and different roots using:

$$\frac{-b+\sqrt{D}}{2a}, \frac{-b-\sqrt{D}}{2a}$$

Print both roots up to 2 decimal places.

Step 6:- Else if D == 0:

Calculate the single repeated root:

$$\frac{-b}{2a}$$

Print the root twice up to 2 decimal places.

Step 7:- Else (D < 0):

Calculate real part:

$$\frac{-b}{2a}$$

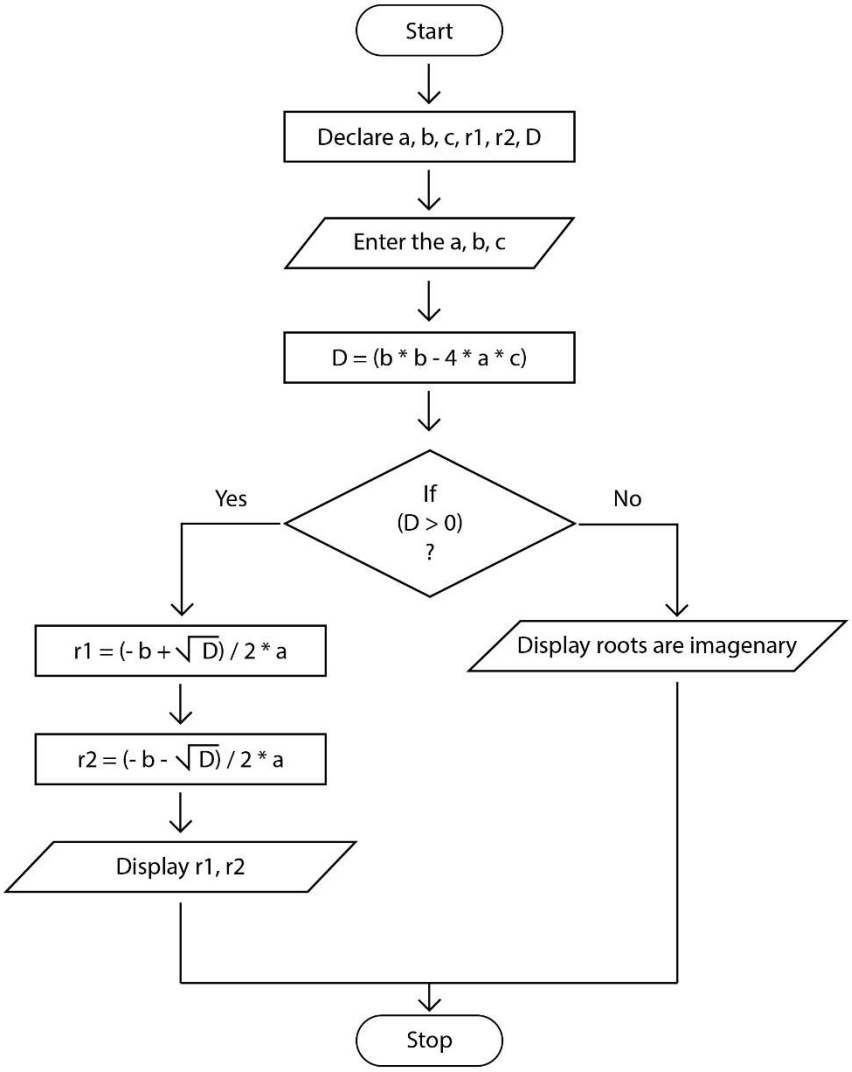
Calculate imaginary part:

$$\frac{\sqrt{-D}}{2a}$$

Print both complex roots up to 2 decimal places.

Step 8:- Stop

FLOWCHART



PHYTHON CODE

```
import math

a, b, c = map(int, input().split())

D = b*b - 4*a*c

if D > 0:
    root1 = (-b + math.sqrt(D)) / (2*a)
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    root2 = (-b - math.sqrt(D)) / (2*a)
    print(f"root1 = {root1:.2f}")
    print(f"root2 = {root2:.2f}")

elif D == 0:
    root = (-b) / (2*a)
    print(f"root1 = root2 = {root:.2f}")

else:
    real = (-b) / (2*a)
    imag = math.sqrt(-D) / (2*a)
    print(f"root1 = {real:.2f}+{imag:.2f}i")
    print(f"root2 = {real:.2f}-{imag:.2f}i")
```

EXCECUTION