

EXPERIMENT - 2

Name : Om Kashikar

PRN : 25070521170

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:

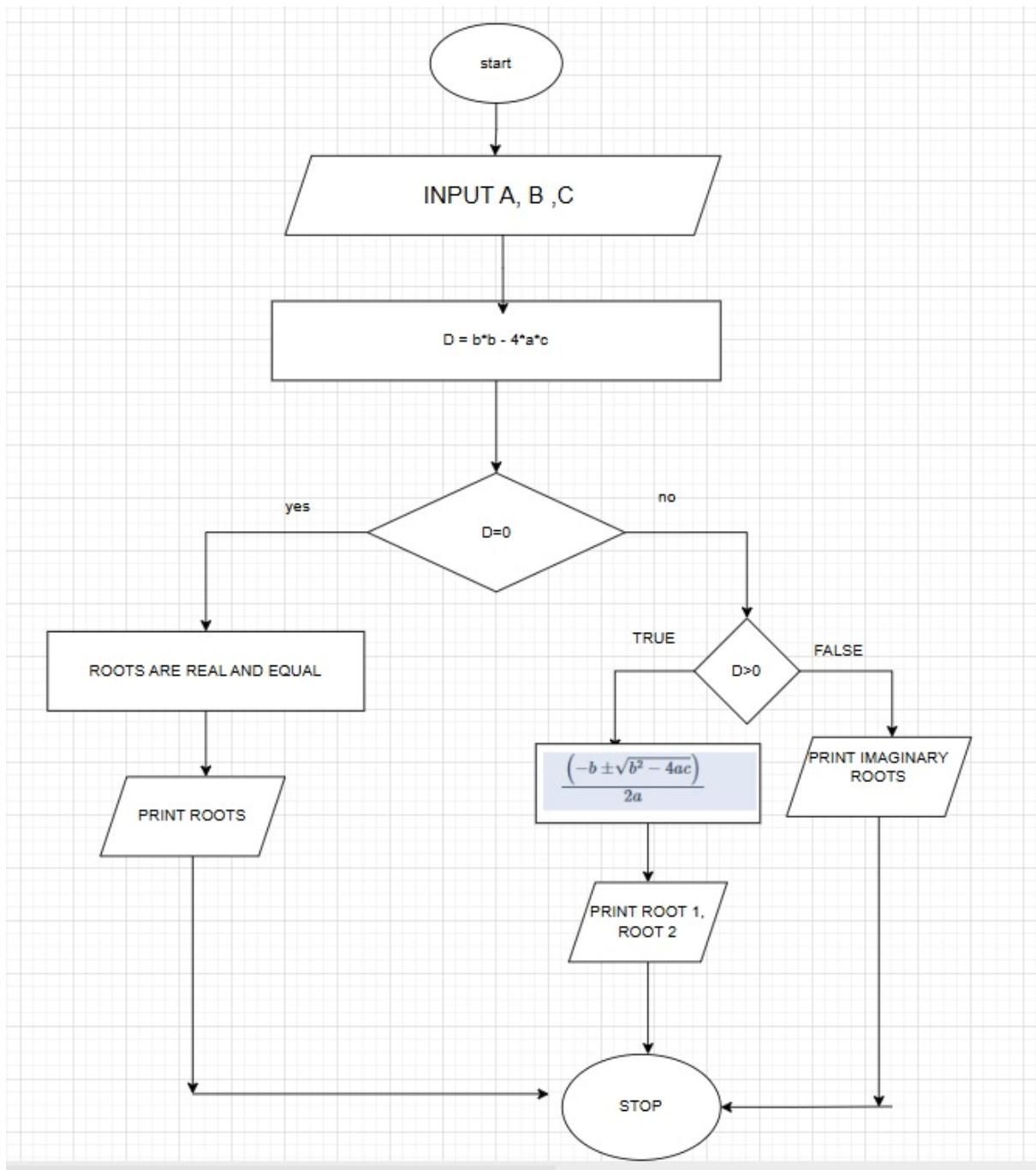
$$\frac{\sqrt{-D}}{2a}$$

Print both complex roots up to 2 decimal places.

Step 8 :- Stop

EXPERIMENT - 2

FLOWCHART



PHYTHON CODE

```
import math
```

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

EXPERIMENT - 2

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

if $D > 0$:

```
root1 = (-b + math.sqrt(D)) / (2*a)
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")
```

EXECUTION

The screenshot shows the CodeTantra IDE interface with the following details:

- Title Bar:** CODETANTRA Home
- Header:** 2.1.1. Roots of a Quadratic Equation
- Editor Area:** A code editor containing Python code for solving quadratic equations. The code uses the quadratic formula to find roots based on the discriminant D . It handles three cases: $D > 0$ (real and different), $D = 0$ (real and same), and $D < 0$ (imaginary).
- Output Area:** Shows the results of 6 test cases. 3 out of 3 shown test cases passed, and 3 out of 3 hidden test cases passed.
- Test Case 1:** Expected output: 1 -5 6. Actual output: root1 = -3.00, root2 = -2.00.
- Test Case 2:** Expected output: 1 -5 6. Actual output: root1 = -3.00, root2 = -2.00.
- Bottom Buttons:** Prev, Reset, Submit, Next

EXPERIMENT - 2