Experiment 2.1.1

Roots of an experiment

Algorithm : Step 1 : Start.

Step 2 : Read three space-separated integers a, b, and c.

Step 3 : Calculate the discriminant.

D=b*b -4*a*c

Step 4 : Check the value of the discriminant .

- Case1: If D > 0 (Real and different roots)
Print: root1,root2.
- Case 2: If D == 0 (Real and same roots)
Print : root1=root2.
- Case 3: If D < 0 (Imaginary roots)
Print : Root = root 1 + imaginary
Root = root 2 + imaginary Step 5 :
Stop.

Code:

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


D = (b*b) - (4*a*c) sqrD

= D ** 0.5


if D > 0:

    root1 = (-b + sqrD) / (2*a)

root2 = (-b - sqrD) / (2*a)

print("root1 = " f"{root1:.2f}")

print("root2 = " f"{root2:.2f}") elif D

== 0:
```
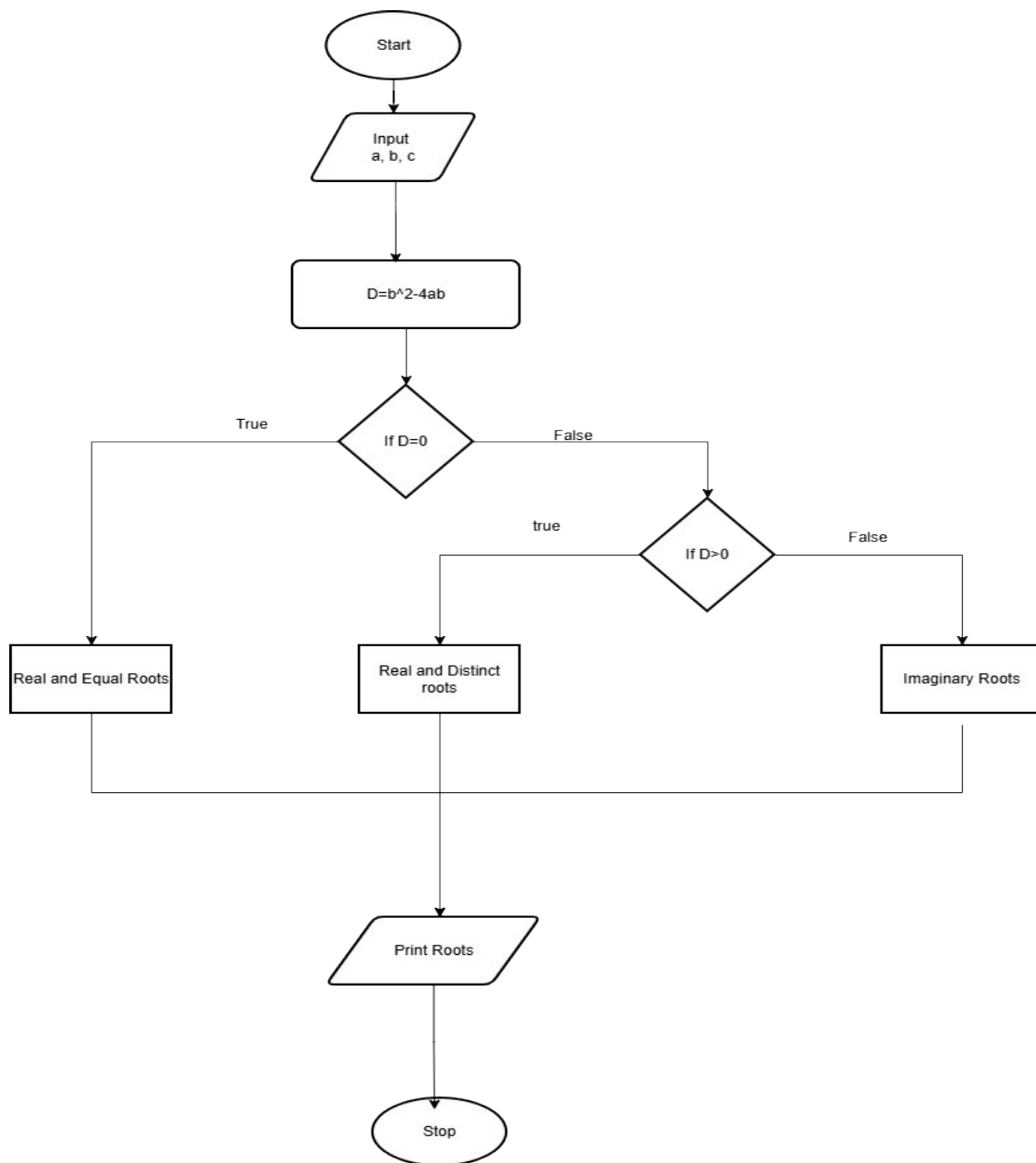
```python
    root1 = root2 = -b / (2*a)
print("root1 = root2 = " f"{root1:.2f}")


else:
    real = (-b) / (2*a)    imaginary = sqrD /
(2*a)    print(f"root1 =
{real:.2f}+{imaginary:.2f}i")    print(f"root2 =
{real:.2f}-{imaginary:.2f}i")
```

FlowChart:

Start

Input
a, b, c

D=b^2-4ab

If D=0

True

False

If D>0

true

False

Real and Equal Roots

Real and Distinct roots

Imaginary Roots

Print Roots

Stop

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
root2 = <RealPart>-<ImaginaryPart>i
```

- All values should be formatted to two decimal places.

Sample Test Cases   +

quadratic...

```python
# Write your code here...
a,b,c = map (float,input().split())
D = (b * b)-(4*a*c)
sqrD = D ** 0.5
root1=(-b+sqrD)/(2*a)
root2=(-b-sqrD)/(2*a)
if D>0:
    print("root1 = "f"{root1:.2f}")
    print("root2 = "f"{root2:.2f}")
elif D == 0:
    print("root1 = root2 = "f"{root1:.2f}")
else:
    print(f"root1 = {root1.real:.2f}+{root1.imag:.2f}i")
    print(f"root2 = {root2.real:.2f}{root2.imag:.2f}i")
```

Average time 0.003 s 3.17 ms   **Maximum time** 0.005 s 5.00 ms

✓ 3 out of 3 shown test case(s) passed
✓ 3 out of 3 hidden test case(s) passed

✓ Test case 1 5 ms   🐞 Debug

Expected output	Actual output
1 -5 6	1 -5 6
root1 = 3.00	root1 = 3.00
root2 = 2.00	root2 = 2.00

✓ Test case 2 3 ms

▶ Terminal   ⊞ Test cases

< Prev   Reset   Submit   Next >