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

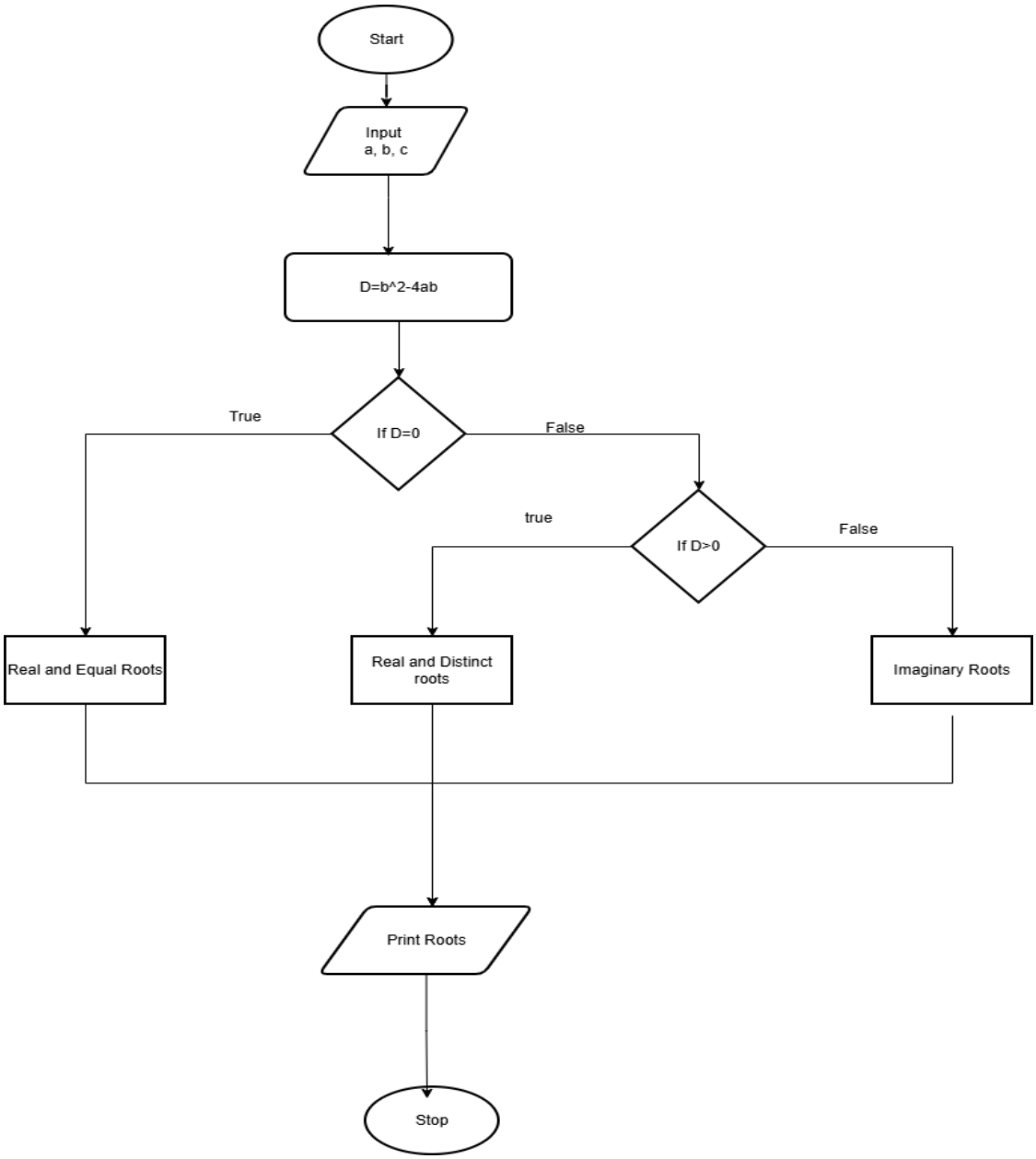
Step 5 : Stop.

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:
    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

53:35

Write a program to find the roots of a quadratic equation, given its coefficients a, b, and c. Use the quadratic formula:

$$\frac{\left(-b \pm \sqrt{b^2 - 4ac}\right)}{2a}$$

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 +

Explorer

quadratic...

Submit

```python
# Write your code here...
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:
    root1 = root2 = -b/(2*a)
    print("root1 = root2 = "f"{root1:.2f}")
else:
    real = (-b)/(2*a)
    imaginary = sqrD/(2*a)
    print(f"root1 = {real.real:.2f}+{imaginary.imag:.2f}i")
    print(f"root2 = {real.real:.2f}-{imaginary.imag:.2f}i")
```

Debugger

Average time	Maximum time
0.003 s	0.006 s
3.33 ms	6.00 ms

3 out of 3 shown test case(s) passed

3 out of 3 hidden test case(s) passed

Test case 1 6 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 ›