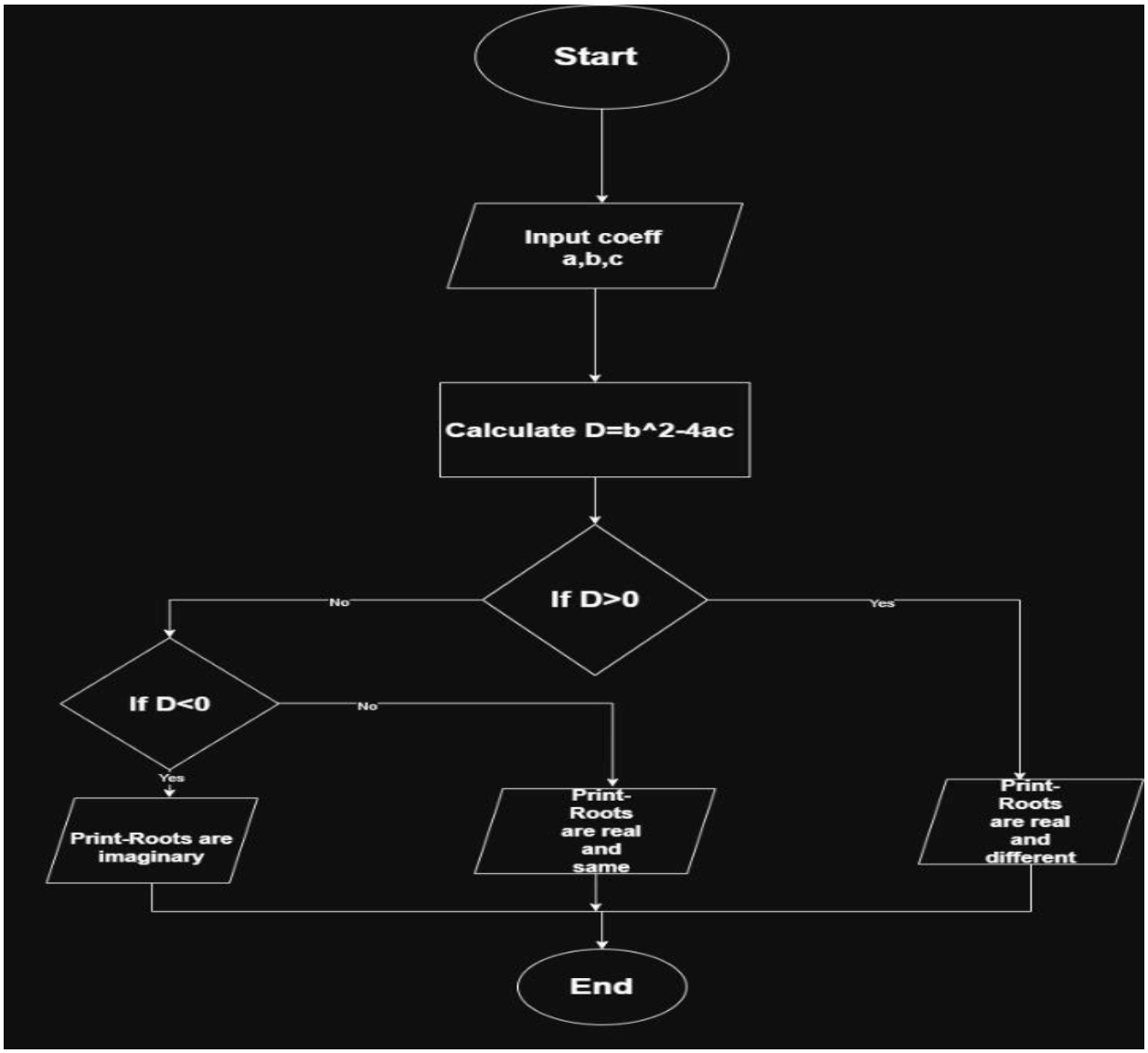
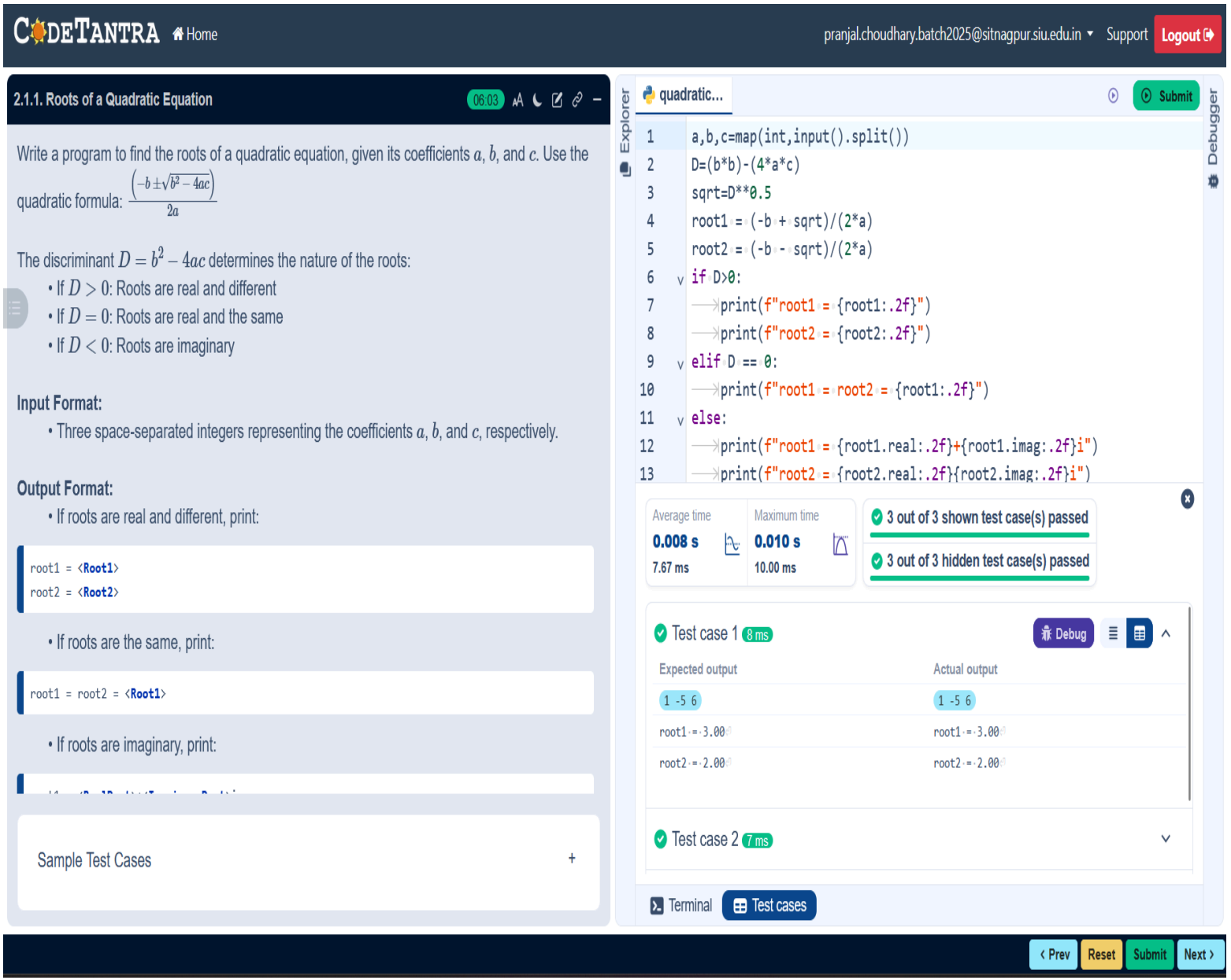
Experiment 2.1:Roots of quadratic equation

Algorithm:

```
Step 1: START
Step 2: INPUT coefficients a, b, c (as integers)
Step 3: CALCULATE discriminant D = b² - 4ac
Step 4: CHECK the value of D:
Step 5:    IF D > 0:
Step 6:      CALCULATE root1 = (-b + √D) / (2a)
Step 7:      CALCULATE root2 = (-b - √D) / (2a)
Step 8:      OUTPUT root1 and root2 (2 decimal places)
Step 9:    ELSE IF D = 0:
Step 10:     CALCULATE root = -b / (2a)
Step 11:     OUTPUT root1 = root2 = root (2 decimal places)
Step 12:   ELSE (D < 0):
Step 13:     CALCULATE real_part = -b / (2a)
Step 14:     CALCULATE imaginary_part = √(-D) / (2a)
Step 15:     OUTPUT root1 and root2 in complex form (2 decimal places)
Step 16: STOP
```

Flowchart:

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2.1.1. Roots of a Quadratic Equation
06:03
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:
Sample Test Cases
Explorer
quadratic...
Submit
Debugger
1 a,b,c=map(int,input().split())
2 D=(b*b)-(4*a*c)
3 sqrt=D**0.5
4 root1 = (-b + sqrt)/(2*a)
5 root2 = (-b - sqrt)/(2*a)
6 if D>0:
7 print(f"root1 = {root1:.2f}")
8 print(f"root2 = {root2:.2f}")
9 elif D == 0:
10 print(f"root1 = root2 = {root1:.2f}")
11 else:
12 print(f"root1 = {root1.real:.2f}+{root1.imag:.2f}i")
13 print(f"root2 = {root2.real:.2f}{root2.imag:.2f}i")
Average time
0.008 s
7.67 ms
Maximum time
0.010 s
10.00 ms
3 out of 3 shown test case(s) passed
3 out of 3 hidden test case(s) passed
Test case 1 8 ms
Debug
Expected output
1 -5 6
root1 = 3.00
root2 = 2.00
Actual output
1 -5 6
root1 = 3.00
root2 = 2.00
Test case 2 7 ms
Terminal
Test cases
‹ Prev
Reset
Submit
Next ›

Code: