Experiment 2.1.1

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

Algorithm:-

Step 1: Start
Step 2: Read coefficients a, b, and c
Step 3: Compute discriminant

$D = b^2 - 4ac$

Step 4:

- If D > 0

  Compute
  root1 = (-b + √D) / (2a)
  root2 = (-b − √D) / (2a)
  Display both roots

- Else if D = 0

  Compute
  root = -b / (2a)
  Display root1 = root2 = root

- Else

    Compute

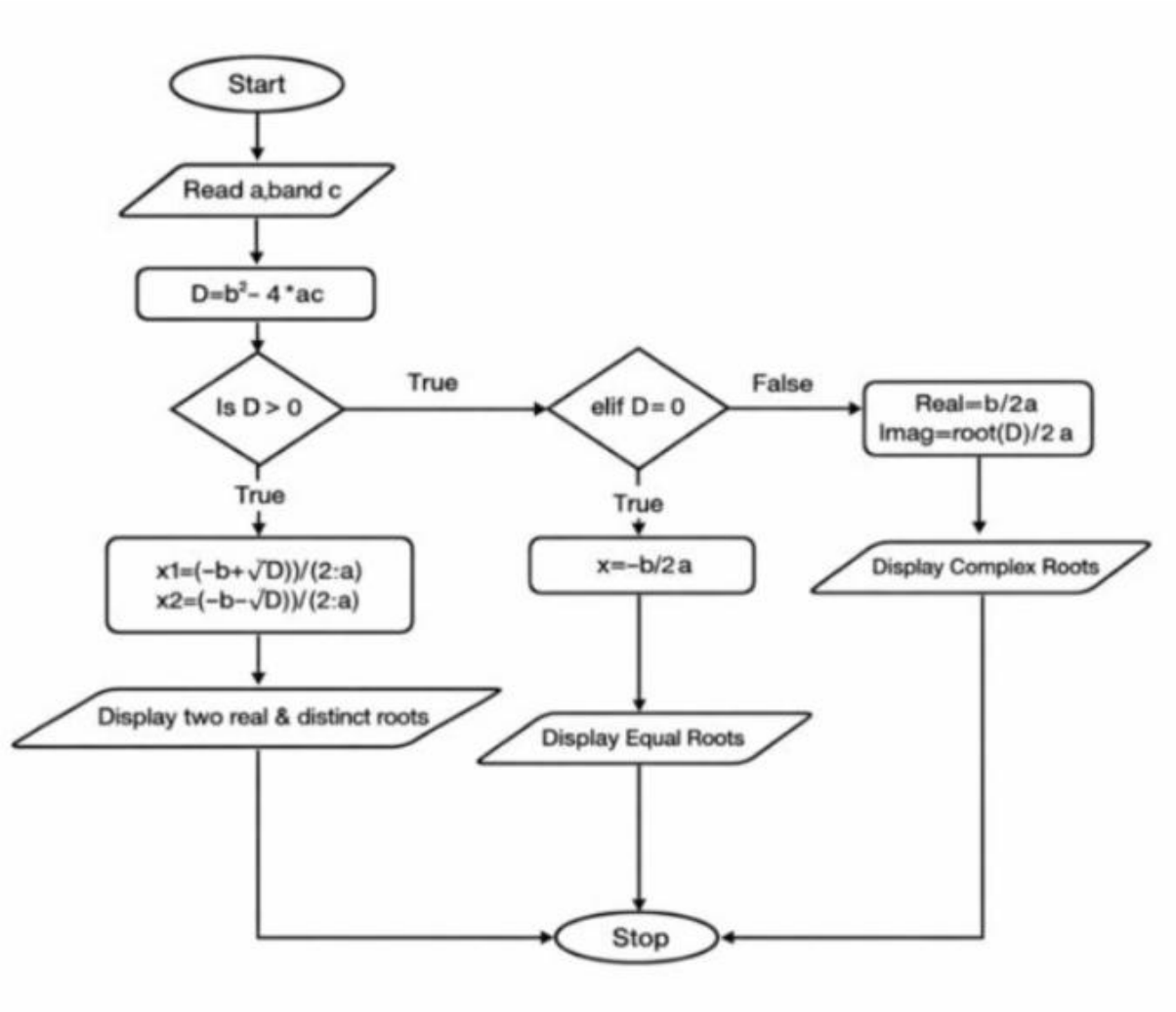
    realPart = -b / (2a)

    imagPart = √(-D) / (2a)

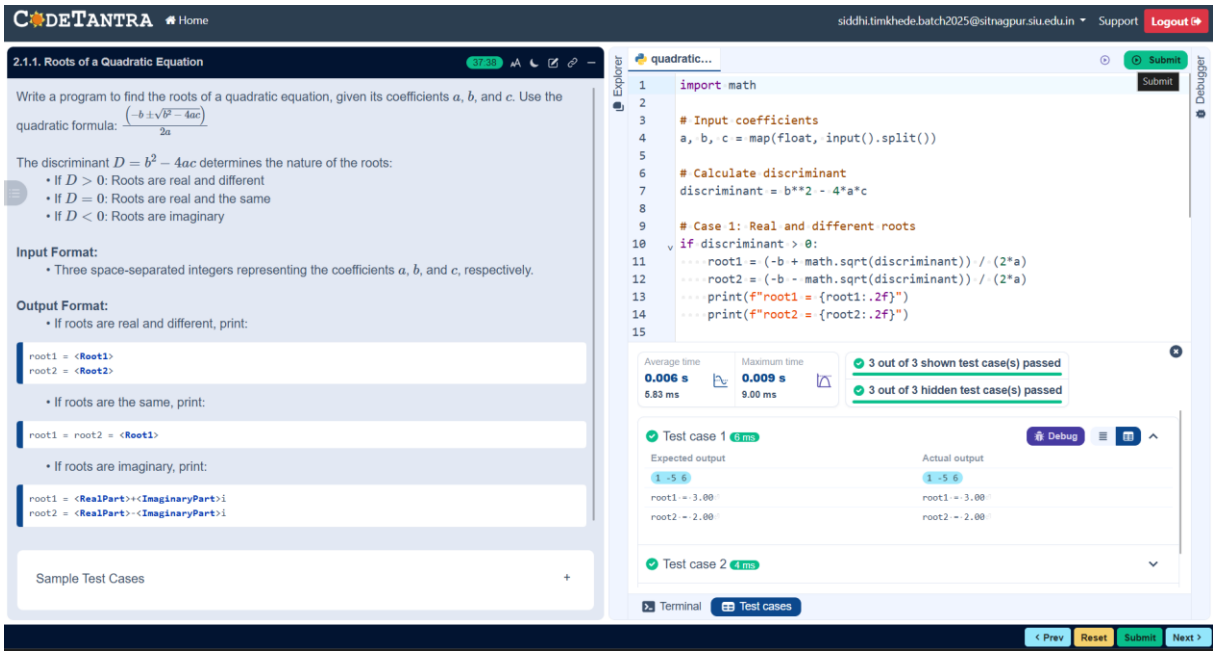
    Display complex roots

Step 5: Stop

Flowchart:-


Start
Read a,band c
D=b²- 4*ac
Is D > 0
True
elif D= 0
False
Real=b/2a
Imag=root(D)/2 a
True
True
x1=(-b+√D))/(2:a)
x2=(-b-√D))/(2:a)
x=-b/2 a
Display Complex Roots
Display two real & distinct roots
Display Equal Roots
Stop

Code:-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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:
The discriminant D = b² − 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
Sample Test Cases
quadratic...
Submit
Explorer
Debugger
import math
# Input coefficients
a, b, c = map(float, input().split())
# Calculate discriminant
discriminant = b**2 - 4*a*c
# Case 1: Real and different roots
if discriminant > 0:
root1 = (-b + math.sqrt(discriminant)) / (2*a)
root2 = (-b - math.sqrt(discriminant)) / (2*a)
print(f"root1 = {root1:.2f}")
print(f"root2 = {root2:.2f}")
Average time
0.006 s
5.83 ms
Maximum time
0.009 s
9.00 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
1 -5 6
root1 = 3.00
root2 = 2.00
Actual output
1 -5 6
root1 = 3.00
root2 = 2.00
Test case 2
4 ms
Terminal
Test cases
Prev
Reset
Submit
Next