2.1.1. Roots of a Quadratic Equation

Algorithm: To Find the Roots of a Quadratic Equation

Step 1: Start

Step 2: Read the values of a, b and c

Step 3: Calculate the discriminant

D = b * b − 4 * a * c

Step 4: Check the value of D

If D > 0, then

root1 = (−b + √D) / (2 * a)
root2 = (−b − √D) / (2 * a)

Print root1 and root2

Else if D = 0, then

root = −b / (2 * a)

Print root1 = root2 = root

Else

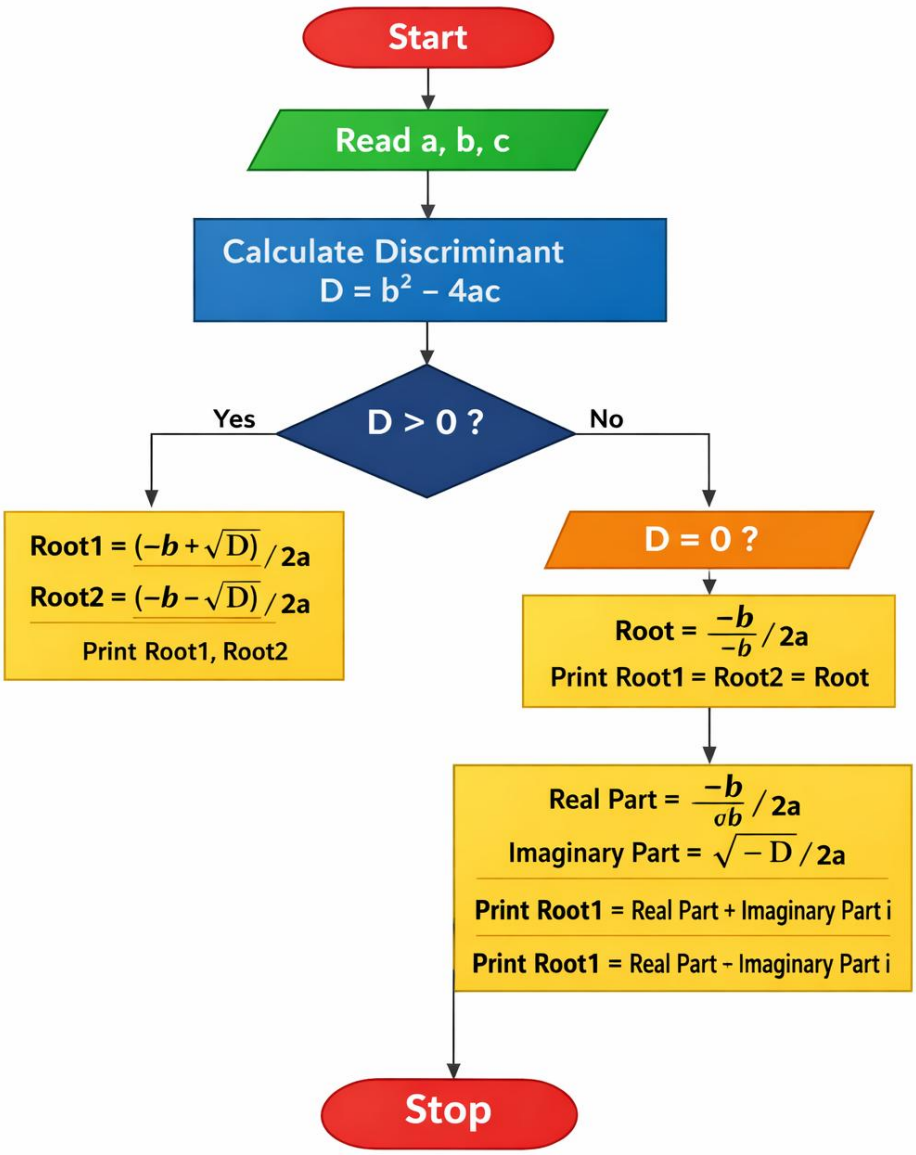
real_part = −b / (2 * a)
imaginary_part = √(−D) / (2 * a)

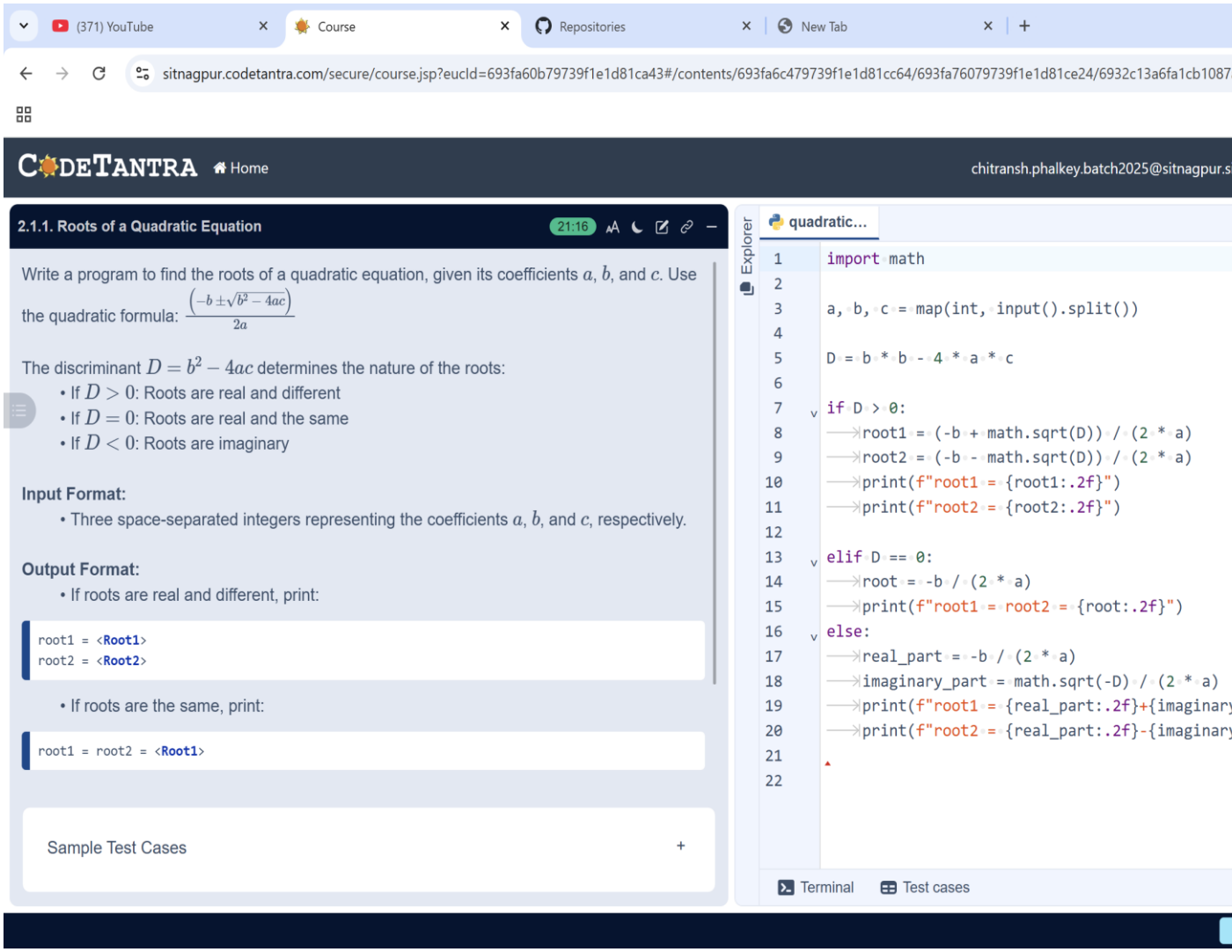
Print
root1 = real_part + imaginary_part i
root2 = real_part − imaginary_part i

Step 5: Stop

Flowchart:-

To Find the Roots of a Quadratic Equation




(371) YouTube
Course
Repositories
New Tab
sitnagpur.codetantra.com/secure/course.jsp?eucId=693fa60b79739f1e1d81ca43#/contents/693fa6c479739f1e1d81cc64/693fa76079739f1e1d81ce24/6932c13a6fa1cb1087
CODETANTRA
Home
chitransh.phalkey.batch2025@sitnagpur.s
2.1.1. Roots of a Quadratic Equation
21:16
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>
Sample Test Cases
Explorer
quadratic...
import math
a, b, c = map(int, input().split())
D = b * b - 4 * a * c
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_part = -b / (2 * a)
imaginary_part = math.sqrt(-D) / (2 * a)
print(f"root1 = {real_part:.2f}+{imaginary
print(f"root2 = {real_part:.2f}-{imaginary
Terminal
Test cases