

Experiment 01:-

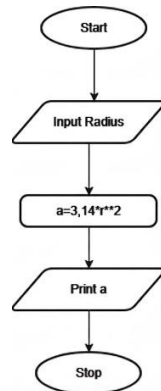
Problem Statement:-

Write a Python program that calculates the area of a circle when the radius is provided by the user. Use $\pi = 3.14$ and display the area.

Algorithm:-

1. Start
2. Read the radius r from the user
3. Calculate the area using the formula:
 $\text{Area} = 3.14 \times r \times r$
4. Display the area
5. Stop.

Flowchart:-



Execution:-

The screenshot shows the CodeTANTRA IDE interface. On the left, the problem statement and input/output formats are displayed. The main editor shows the following Python code:

```
1 radius = float(input())
2
3 pi = 3.14
4
5 area = pi * radius * radius
6
7 print(f"area:.4f")
8
9
10
```

The execution results show that the program passed all test cases. The average time was 0.004 s and the maximum time was 0.006 s. The output for the first test case is 3.36, which matches the expected output of 3.36.

Test Case	Expected output	Actual output
Test case 1	3.36	3.36
Test case 2	35.4403	35.4403

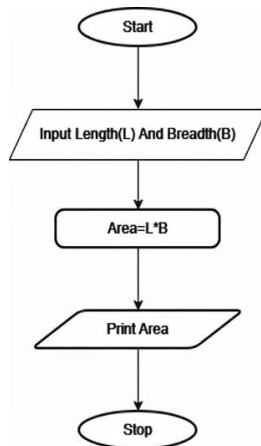
Problem Statement:-

Write a Python program to calculate the area of a rectangle given its length and width.

Algorithm:-

1. Start.
2. Read the length l and Width b from the user.
3. Calculate the area using the formula:
 $\text{Area} = l * b$.
4. Display the area.
5. Stop.

Flowchart:-



Execution:-

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1.1.2. Area of Rectangle

Write a Python program to calculate the area of a rectangle given its length and width.

Formula:
Area of Rectangle = Length × Width

Input Format:
• First line contains a float value representing the length of the rectangle
• Second line contains a float value representing the width of the rectangle

Output Format:
• Print the area of the rectangle as a float value formatted to 2 decimal places.

Sample Test Cases

```

1 length = float(input())
2 breadth = float(input())
3 area = length * breadth
4 print(f'{area:.2f}')
5
6
7
8
  
```

Average time: 0.004 s Maximum time: 0.007 s

5 out of 5 shown test case(s) passed
5 out of 5 hidden test case(s) passed

Test case 1
Expected output: 18.3 Actual output: 18.3
54.50 54.50

Test case 2

Terminal Test cases

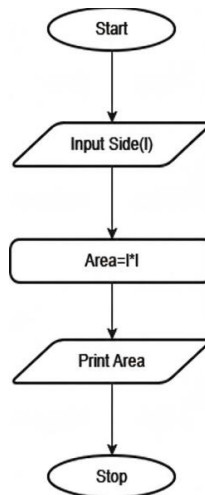
< Prev Reset Submit Next >

Problem Statement:-

Write a Python program that prompts the user to enter the Side Length of a square and computes the area of the square.

Algorithm:-

1. Start.
2. Read the side length s of the square.
3. Calculate the area using the formula: $\text{Area} = s \times s$.
4. Display the area
5. Stop.

Flowchart:-

Execution:-

The screenshot displays the CodeTANTRA web interface. On the left, the problem statement for '1.1.3. Calculate Area of the Square' is shown, including the formula $\text{Area} = \text{side_length}^2$ and input/output formats. The main editor shows a Python script:

```
1 side = int(input())
2 area = side * side
3 print(area)
4
5
6
7
8
9
10
11
```

 The right sidebar shows the execution results: '2 out of 2 shown test case(s) passed' and '2 out of 2 hidden test case(s) passed'. Below this, 'Test case 1' is expanded, showing 'Expected output' as 25 and 'Actual output' as 25. The bottom of the interface has buttons for 'Terminal', 'Test cases', 'Prev', 'Reset', 'Submit', and 'Next'.

3

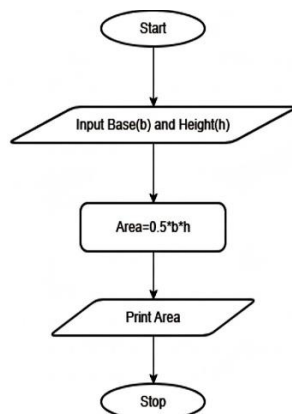
Problem Statement:-

Write a Python program that prompts the user to enter the triangle's base and height and computes the triangle's area.

Algorithm:-

1. Start.
2. Read the base b and height h of the triangle.
3. Calculate the area using the formula: $\text{Area} = 0.5 \times b \times h$.
4. Display the area.
5. Stop.

Flowchart:-



Execution:-

The screenshot displays the CODETANTRA online IDE interface. On the left, the problem statement for '1.1.4. Area of Triangle' is shown, including the formula $\text{Area of Triangle} = 0.5 \times \text{base} \times \text{height}$, input format instructions, and output format instructions. The main editor shows a Python program that prompts for base and height, calculates the area, and prints it formatted to two decimal places. The right sidebar shows the execution results, indicating that 2 out of 2 shown test cases passed and 2 out of 2 hidden test cases passed. The test cases table shows expected and actual outputs for two cases.

Test Case	Expected output	Actual output
Test case 1	6.56	6.56
Test case 2	4.82	4.82

4

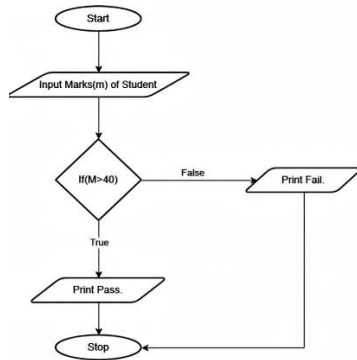
Problem Statement:-

Write a Python program to determine whether a student passed the exam or not based on their marks.

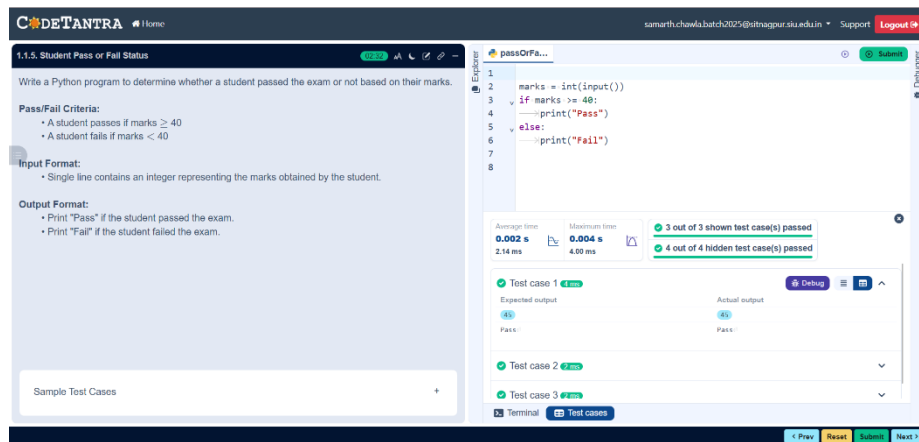
Algorithm:-

1. Start.
2. Read the marks obtained by the student.
3. If marks > 40 → Display “Pass”.
4. Else → Display “Fail”.
5. Stop.

Flowchart:-



Execution:-



Experiment 02:-

Problem Statement:-

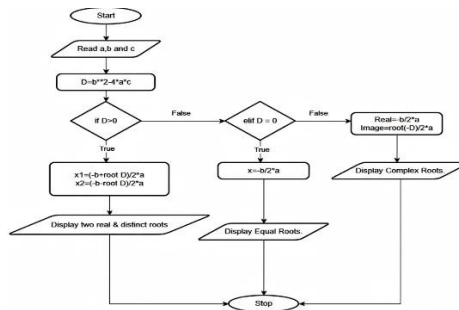
Write a program to find the roots of a quadratic equation, given its coefficients a, b, and c. Use the quadratic formula: $(-b \pm \sqrt{b^2 - 4ac}) / 2a$.

Algorithm:-

1. Start.
2. Read the coefficients a, b, and c.
3. Calculate the discriminant using:- $D = b^2 - 4ac$.

4. If $D > 0$ Compute:- $x_1 = \frac{-b + \sqrt{D}}{2a}$ and $x_2 = \frac{-b - \sqrt{D}}{2a}$ Display two real and distinct roots.
5. Else if $D = 0$ Compute:- $x = -b/2a$ Display equal real roots.
6. Else ($D < 0$) Compute:- Real part = $-b/2a$ Imaginary part = $\sqrt{-D}/2a$ Display complex roots.
7. Stop.

Flowchart:-



Execution:-

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>

Sample Test Cases

```

1 import math
2
3 a, b, c = map(int, input().split())
4
5 d = b*b - 4*a*c
6
7 if d > 0:
8     root1 = (-b + math.sqrt(d)) / (2*a)
9     root2 = (-b - math.sqrt(d)) / (2*a)
10
11 print(root1, root2)
  
```

Average time: 0.006 s, Maximum time: 0.014 s

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

Test case 1: Expected output: 1.00 2.00, Actual output: 1.00 2.00

Test case 2: Expected output: 1.00 1.00, Actual output: 1.00 1.00

Experiment 03:-

Problem Statement:-

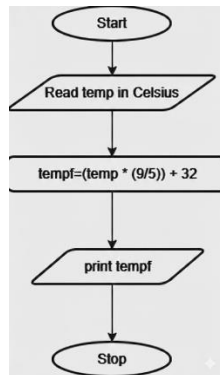
Write a Python program to convert temperature from Celsius to Fahrenheit.

Algorithm:-

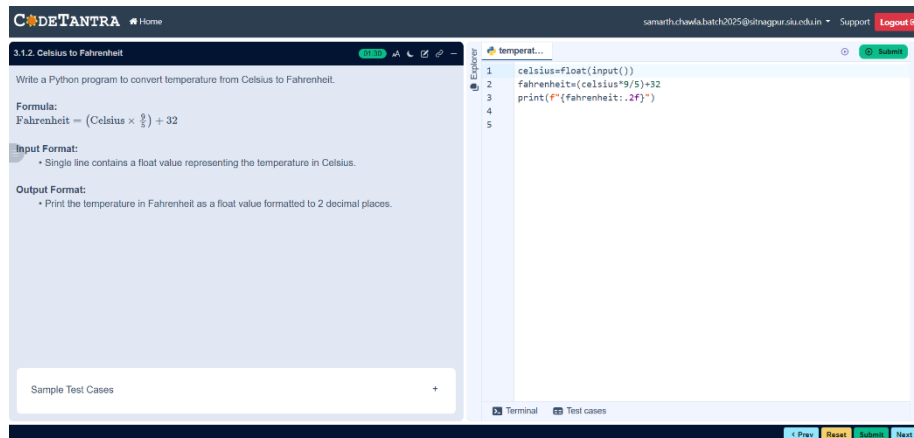
1. Start.
2. Input temperature in Celsius C.
3. Calculate Fahrenheit using the formula $F = (C \times 9/5) + 32$.

4. Display the temperature in Fahrenheit.
5. Stop.

Flowchart:-



Execution:-



Problem Statement:-

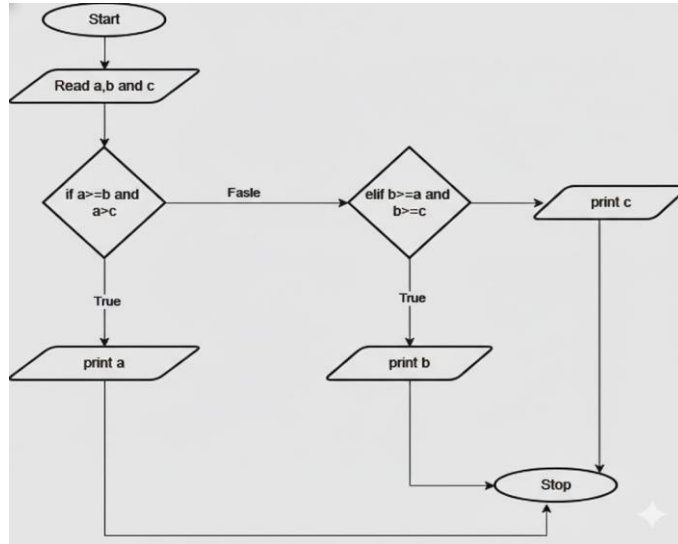
Write a Python program that prompts the user to enter three integers. Print the largest of the three integers.

Algorithm:-

1. Start.

2. Input three integers a, b, and c.
3. If $a \geq b$ and $a \geq c \rightarrow$ Print a as the largest number.
4. Else if $b \geq a$ and $b \geq c \rightarrow$ Print b as the largest number.
5. Else \rightarrow Print c as the largest number.
6. Stop

Flowchart:-



Execution:-

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3.1.1. Largest of Three Numbers

Write a Python program that prompts the user to enter three integers. Print the largest of the three integers.

Input Format:

- The program will prompt the user to enter three integers, one per line.

Output Format:

- The output will display the largest integer among the three integers.

Sample Test Cases

```

1
2
3
4
5
6
7
a = int(input())
b = int(input())
c = int(input())
print(max(a, b, c))
  
```

Average Time: 0.005 s Maximum Time: 0.007 s

2 out of 2 shown test case(s) passed

2 out of 2 hidden test case(s) passed

Test case 1

Expected output	Actual output
5	5
6	6
7	7

Test case 2

Terminal Test cases

Prev Reset Submit Next

Experiment 04:-

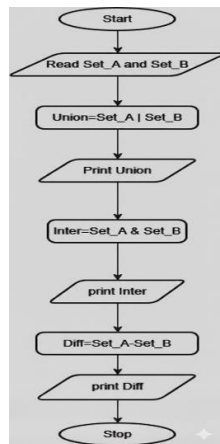
Problem Statement:-

Write a Python program to perform union, intersection and difference operations on Set A and Set B.

Algorithm:-

1. Start.
2. Declare two sets A and B
3. Read elements of Set A from the user
4. Read elements of Set B from the user
5. Perform Union operation $\text{Union} = A \cup B$.
6. Perform Intersection operation $\text{Intersection} = A \cap B$.
7. Perform Difference operations
8. $\text{Difference1} = A - B$.
9. Display Set A and Set B
10. Display Union, Intersection, and Difference results
11. Stop.

Flowchart:-



Execution:-

The screenshot shows the CodeTANTRA IDE interface. On the left, the problem statement and instructions are visible. The main editor displays the following Python code:

```
1 set_a = set(map(int, input("Set A: ").split()))
2
3 set_b = set(map(int, input("Set B: ").split()))
4
5 union_set = set_a.union(set_b)
6 intersection_set = set_a.intersection(set_b)
7 difference_set = set_a.difference(set_b)
8
9
10 print("Union:", union_set)
11 print("Intersection:", intersection_set)
12 print("Difference:", difference_set)
13
14
```

The output of the program is shown in the terminal at the bottom, displaying the results of the union, intersection, and difference operations for the input sets.

