

EXERCISE

1. Briefly answer the following questions:

a. How conditional logic is different than sequential logic?

Answer: Conditional logic executes statements based on conditions, whereas sequential logic executes statements one after another, regardless of conditions.

b. Can we use multi-way selection if we have two conditions and three statement sets?

Answer: No, multi-way selection typically handles 3+ conditions. For 2 conditions, use if-else statements.

c. How can you differentiate multi-way and choice-way selection?

Answer: Multi-way: multiple conditions, multiple statement sets. Choice-way (if-else): one condition, two statement sets.

d. How many statement sets are there in multi-way selection if we have 8 conditions?

Answer: 8 conditions = 8 statement sets (1 for each condition).

e. What is advantage of using repetitive logic?

Answer: Repetitive logic advantages: efficient handling of repeated tasks, reduced code duplication.

f. When will you use counter-controlled repetition logic?

Answer: Counter-controlled repetition: use when knowing the exact number of iterations.

g. When will you use sentinel-controlled repetition logic?

Answer: Sentinel-controlled repetition: use when unknown number of iterations, with a terminating condition.

h. Is it possible to use multi-way logic in place on choice-way logic?

Answer: Yes, multi-way logic can replace choice-way logic but is less efficient for simple 2-condition scenarios.

2. For each of the following statement specify which type of conditional or repetition logic You will use.

- A. One-Way Selection
- B. Two-Way Selection
- C. Multi-Way Selection
- D. Choice-Way Selection
- E. Counter-Controlled Repetition
- F. Sentinel-Controlled Repetition
- G. None of them

Statement	Logic
Specifying grade on the basis of percentage	C
Checking number is even or odd	B
Getting three numbers as input from the user	G
Calculating the area of triangle	G
Checking number is positive or not	B
Checking number is prime or composite	B

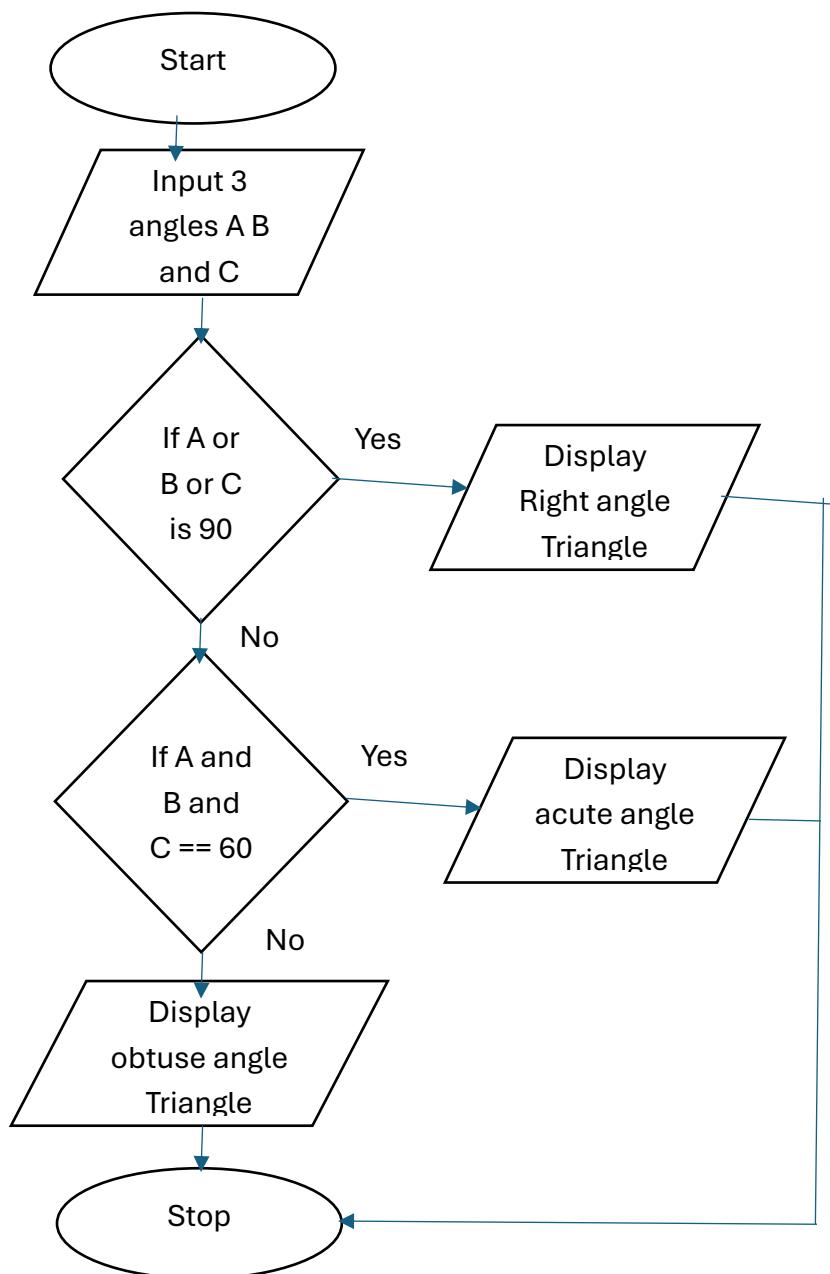
3. For each of the following problem statement, create the IPO chart with algorithm and flow Chart.

Problem Statement 1

Write a computer program that asks the user to enter three angles of a triangle. The program displays Whether the triangle is right-angle, acute-angle or obtuse-angle.

Input	Processing	Output
Three angles, A, B, C	<p>Items:</p> <p>Algorithm</p> <p>Step1: Start</p> <p>Step2: Input three angles (A), (B), and (C) from the user.</p> <p>Step3: Check if the sum of (A), (B), and (C) is equal to 180 degrees.</p> <p>Step4: If A or B or C ==90 then display "The triangle is</p>	<p>The output can be either one of three depending on the user inputted angles</p> <ol style="list-style-type: none"> 1. The triangle is a right-angle triangle 2. The triangle is a acute-angle triangle 3. The triangle is a obtuse-angle triangle

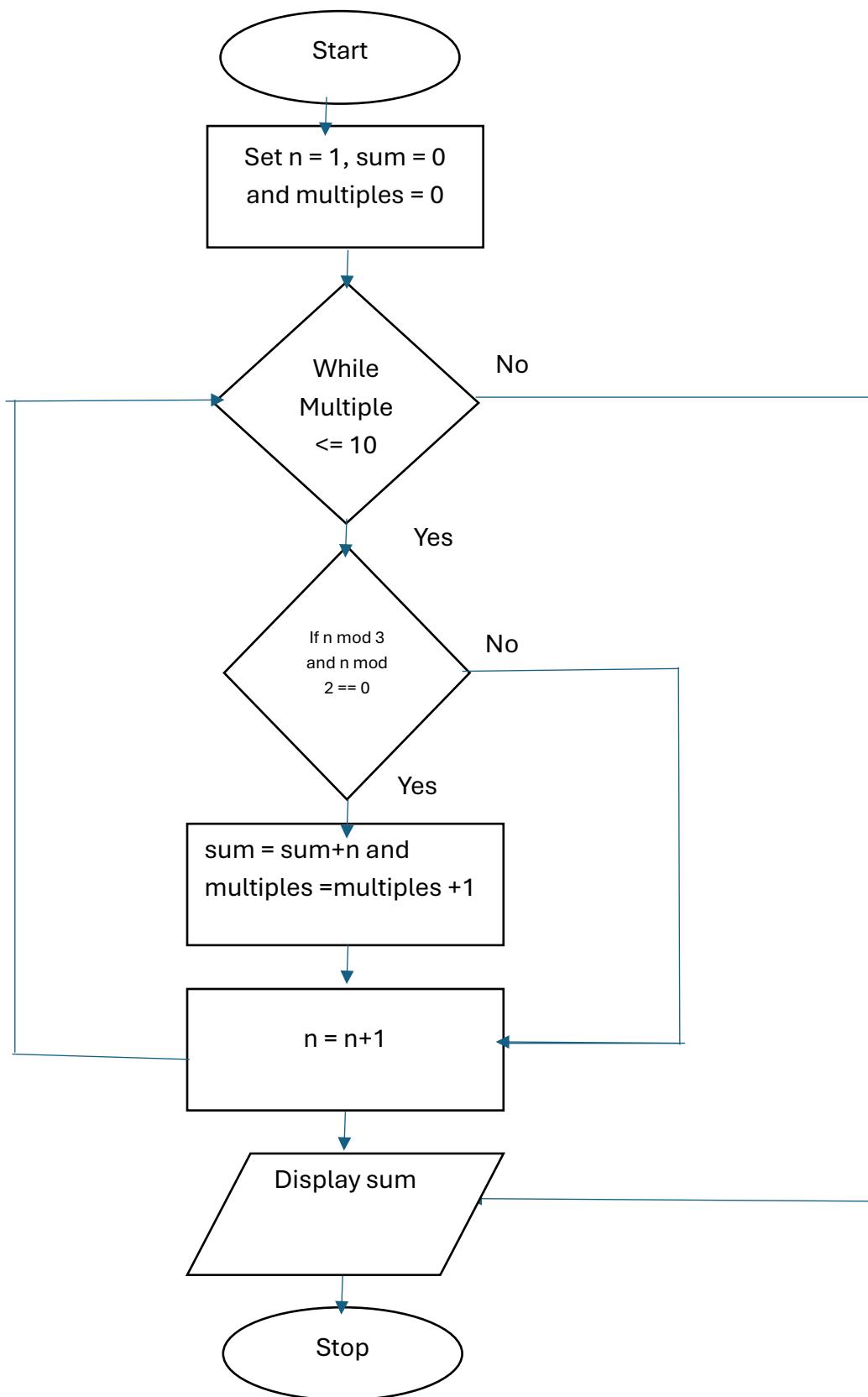
a right-angle triangle” and end, else go to Step5.
 Step5: if ($A < 90$) and ($B < 90$)
 and ($C < 90$) then display
 “The triangle is a acute-angle triangle” and end else
 go to Step6.
 Step6: display “the triangle
 is obtuse angle triangle
 Step7: End



Problem Statement 2

Write a computer program that displays the sum of first 10 odd multiples of 3.

Input	Processing	Output
Three angles as A, B and C	Items: 1. $n \bmod 3 = 0$ 2. $n \bmod 2 = 0$ Algorithm: Step1: Start Step2: Set $n = 1$, $sum = 0$, $multiples = 0$ Step3: Repeat step 4 to Step 6 while $multiples \leq 10$ Step4: if ($n \bmod 3 == 0$) and ($n \bmod 2 == 0$) then go to step 5 else go to step 6 Step5: $sum = sum + n$ and $multiples = multiples + 1$ Step6: $n = n + 1$ Step7: Display sum Step8: Stop	1. 3 2. 9 3. 15 4. 21 5. 27 6. 33 7. 39 8. 45 9. 51 10. 57



Problem Statement 3

Write a computer program that displays the sum of last 5 four-digit multiples of 5.

Input	Processing	Output
	<p>Items $n \bmod 5 = 0$</p> <p>Algorithm</p> <p>Step 1: Start</p> <p>Step 2: Set $n = 9995$, sum = 0, multiple = 0</p> <p>Step 3: Repeat while $multiple \leq 5$</p> <p>Step 4: sum = sum + n, multiple = multiple + 1</p> <p>Step 5: Display sum</p> <p>Step 6: Stop</p>	$9950 + 9955 + 9960 + 9965 + 9970 = 49,750$

