Algorithms

What is an Algorithm?

- A set of exact steps which when followed, solves the problem or accomplish the required task.
- An algorithm is a procedure or step-by-step instruction for solving a problem.
- Algorithms act as an exact list of instructions that conduct specified actions step by step in either hardware or software-based routines.

Algorithms

Every algorithm should have the following five characteristics:

- Input: Should take desired input.
- Definitiveness: Each step must be defined precisely.
- Effectiveness: It's operations must be basic enough to be done exactly and for infinite time.
- Termination: Must terminate after a finite number of steps.
- Output: Should provide desired output.

Example

Algorithm for finding the average of three numbers is as follows –

- Start
- Read 3 numbers a,b,c
- Calculate sum = a+b+c
- Calculate average = sum/3
- Print average value
- Stop

What is a Flowchart?

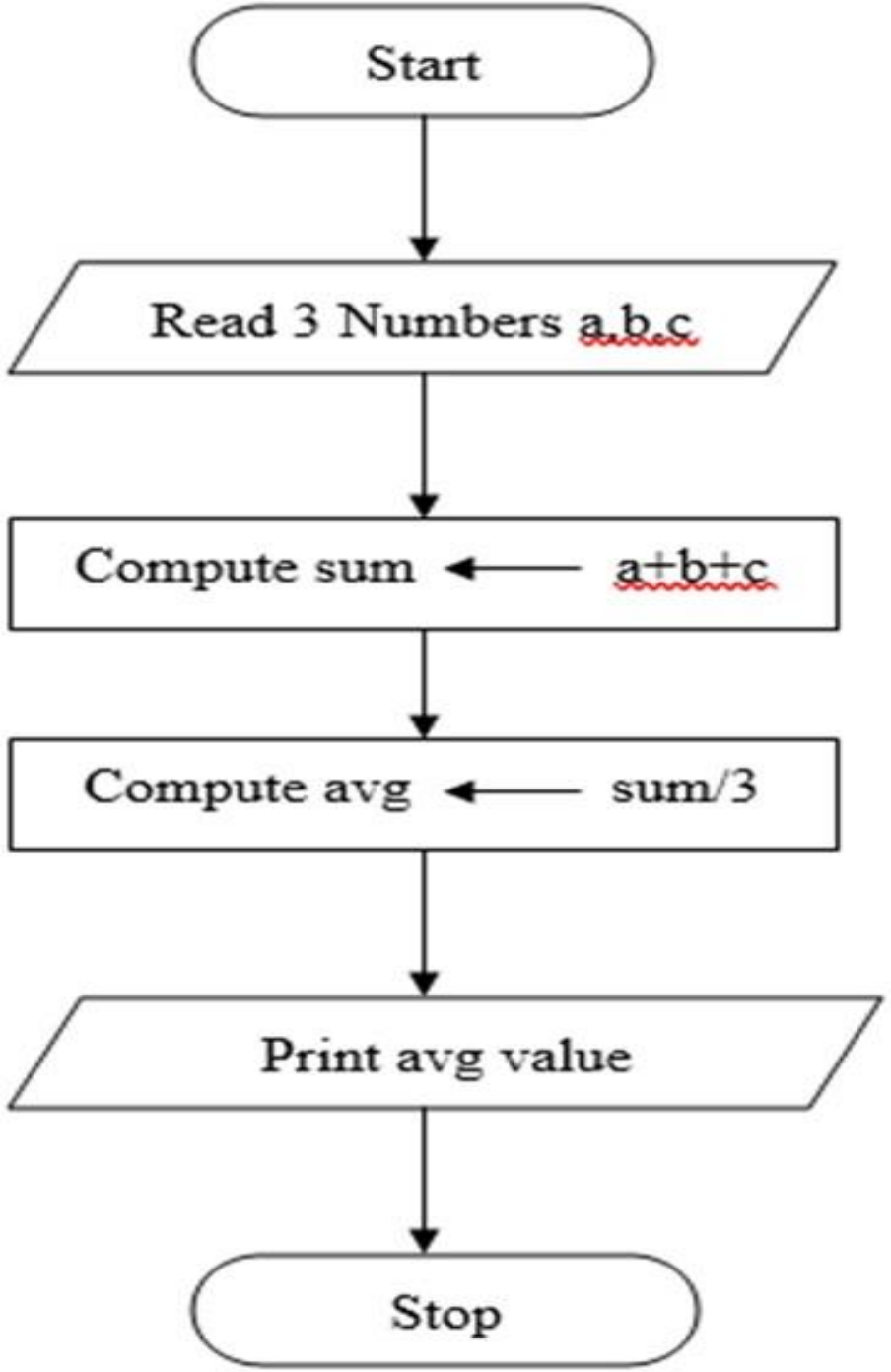
- Diagrammatic or visual representation of an algorithm is called flow chart.
- A flowchart is a diagram made up of boxes, diamonds and other shapes connected by arrows.
- Each shape represents a step of solution process and arrow represents the order or link among the steps.

What is a Flowchart?

Symbol	Name	Function
	Start/end	An oval represents a start or end point.
	Arrows	A line is a connector that shows relationships between the representative shapes.
	Input/Output	A parallelogram represents input or ouptut.
	Process	A rectangle represents a process.
	Decision	A diamond indicates a decision.

Example

- Flowchart for finding an average of three numbers.



Pseudo Code

- If, an algorithm is written in English like sentences then, it is called as 'PSEUDO CODE'.
- It is considered as a non-formal language that helps programmer to write algorithm.
- It is a detailed description of instructions that a computer must follow in a particular order.

Pseudo Code

- It is intended for human reading and cannot be executed directly by computer.
- No specific standard for writing pseudocode exists.
- Keywords used in pseudocode are – INPUT, COMPUTE, PRINT, INCREMENT, DECREMENT, IF/ELSE, WHILE, TRUE/FALSE

Example

- Write an algorithm to calculate area and perimeter of rectangle.

INPUT Length
INPUT Breadth
COMPUTE Area=Length*Breadth
PRINT Area COMPUTE Perimeter=2*(Length + Breadth)
PRINT Perimeter