Algorithm and Flowchart

Algorithm

An algorithm is a complete, detailed, and precise step-by-step method for solving a problem independently of the software or hardware of the computer. Algorithms are very essential, as they instruct the computer what specific steps it needs to perform to carry out a particular task or to solve a problem

Efficiency of an Algorithm

Effi ciency of an algorithm means how fast it can produce the correct result for the given problem. The efficiency of an algorithm depends upon its time complexity and space complexity. The complexity of an I algorithm is a function that provides the running time and space for data, depending on the size provided by us. The two important factors for judging the complexity of an algorithm are as follows:

- ☐ Space complexity
- ☐ Time complexity

Space complexity of an algorithm refers to the amount of memory required by the algorithm for its execution and generation of the fi nal output. Time complexity of an algorithm refers to the amount of computer time required by an algorithm for its execution. This time includes both compile time and run time. The compile time of an algorithm does not depend on the instance characteristics of the algorithm. The run time of an algorithm is estimated by determining the number of various operations, such as addition, subtraction, multiplication, division, load, and store, executed by it

Example 1 Write an algorithm for finding greatest among three numbers.

Let x, y and z be the numbers. Now, we can follow the algorithm below to determine the greatest number among the three:

1. Read the three numbers.
2. If x > y
    a. If x > z, then x is the greatest number.
    b. Else, z is the greatest number
3. Else,
    a. If y > z, then y is the greatest number.
    b. Else, z is the greatest number.

Examples :

- Write the algorithm for converting the degree in Celsius from Fahrenheit
- Write the algorithm for calculating the average of n integers
- Write the algorithm for checking whether a number is odd or even.
- Write the algorithm to determine whether a number is positive, negative or zero.
- Write an algorithm to find the factorial of a given number

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Flowchart

one needs to take the help of a flow chart, which is the pictorial representation of the algorithm depicting the flow of the various steps. If we consider the above example of the expenses of the salesperson, then the flow chart of the algorithm can be represented

Symbol	Purpose	Description
	Flow line	Indicates the flow of logic by connecting symbols.
	Terminal(Stop/Start)	Represents the start and the end of a flowchart.
	Input/Output	Used for input and output operation.
	Processing	Used for arithmetic operations and data-manipulations.
	Decision	Used for decision making between two or more alternatives.
	On-page Connector	Used to join different flowline

- Give a flow chart for addition of two numbers.
- Give a flow chart to print he average of three numbers.
- Find the largest among three different numbers entered by the user.