



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**  
**An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



## **DEPARTMENT OF INFORMATION TECHNOLOGY**

### **19ITB201 – DESIGN AND ANALYSIS OF ALGORITHMS**

**II YEAR IV SEM**

**UNIT-I-Introduction**

**TOPIC: Introduction-Notion of an Algorithm**

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# INTRODUCTION-NOTION OF ALGORITHM



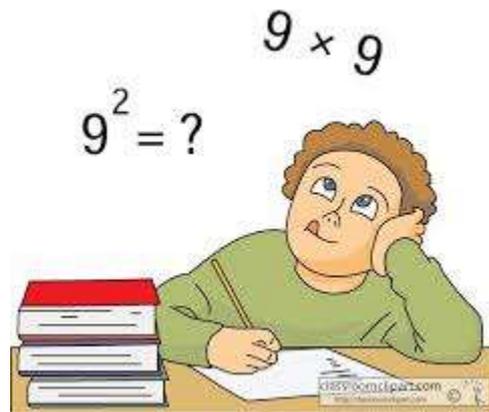
Subject :Design and Analysis of Algorithm  
Unit : I





# What you identified from the picture?

Answer : Solving Problem





# How to solve the problem?



**Answer: Problem solving methods**





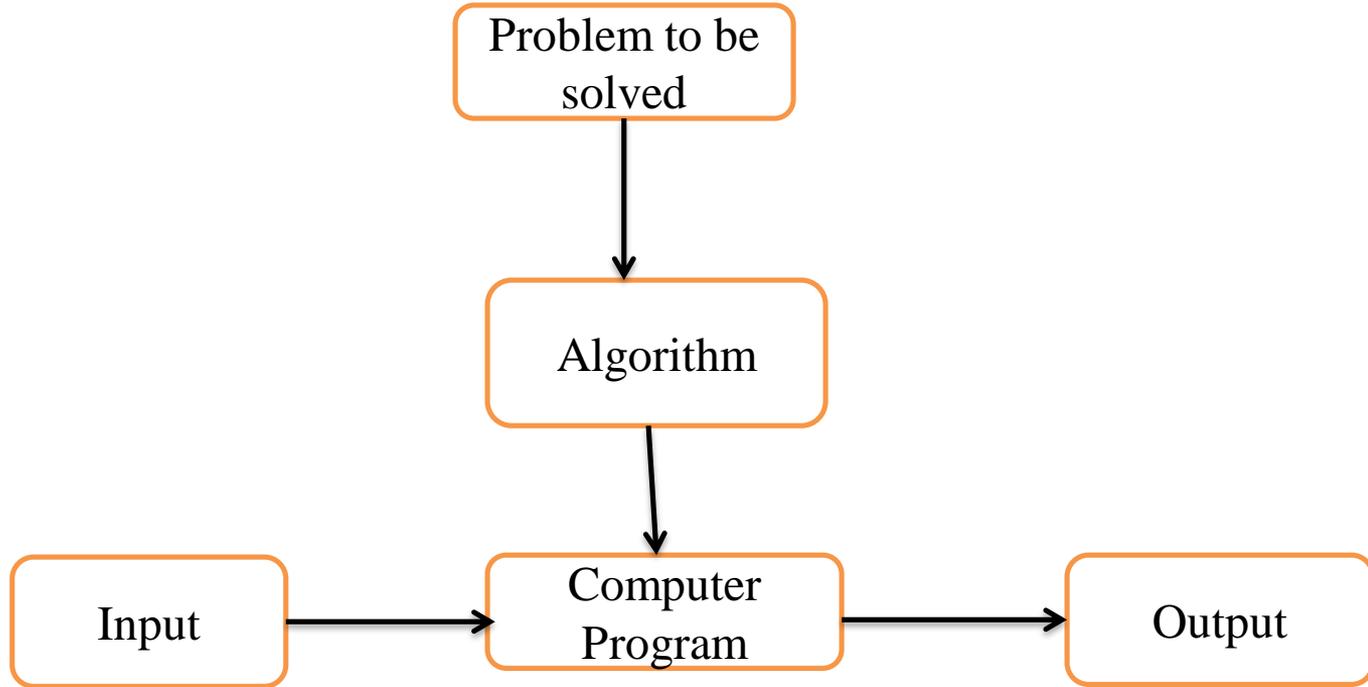
# Definition

An *algorithm* is a sequence of **unambiguous instructions** for **solving a problem**, i.e., for obtaining a required output for any legitimate input in a finite amount of time.





# Notion of an Algorithm



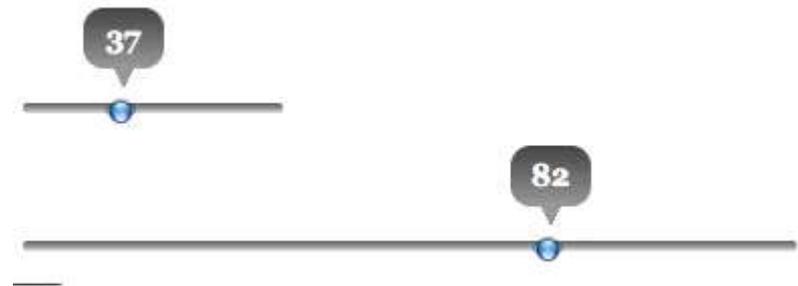


# Properties of an Algorithm

- The **non ambiguity** requirement for each step of an algorithm cannot be compromised.



- The **range of inputs** for which an algorithm works has to be specified carefully.





# Properties of an Algorithm



- The same algorithm can be represented in **Several different ways**.
- There may exist **several algorithms** for solving the same problem
- Algorithms for the same problem can be based on very **different ideas and can solve the problem** with dramatically different speeds





# Characteristics of an algorithm



- ❑ **Input:** Zero / more quantities are externally supplied.
- ❑ **Output:** At least one quantity is produced.
- ❑ **Definiteness:** Each instruction is clear and unambiguous.
- ❑ **Finiteness:** If the instructions of an algorithm is traced then for all cases the algorithm must terminates after a finite number of steps.
- ❑ **Efficiency:** Every instruction must be very basic and runs in short time.





# Characteristics of an algorithm

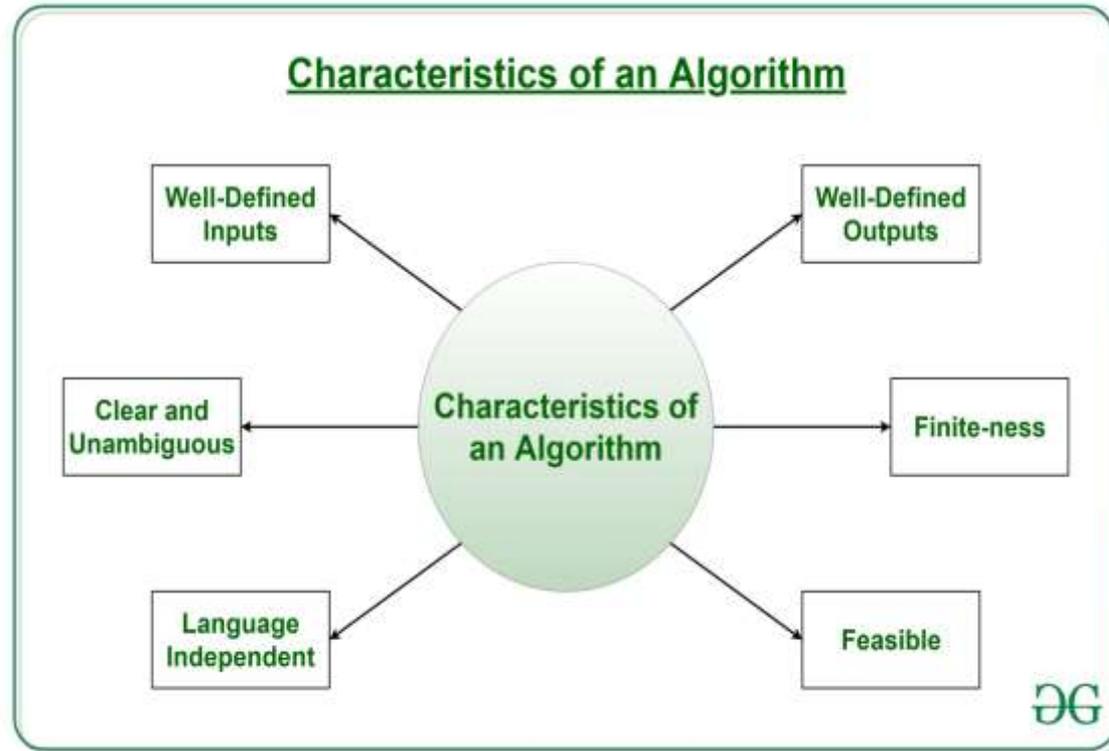


Image Source :<https://www.geeksforgeeks.org/introduction-to-algorithms/>





# Steps for writing an algorithm



- ❑ An algorithm is a procedure. It has two parts; the first part is **head** and the second part is **body**.
- ❑ The Head section consists of keyword **Algorithm** and Name of the algorithm with parameter list. E. g. Algorithm name1(p1, p2,...,p3). The head section also has the following:

**//Problem Description**

**//Input:**

**//Output:**

- ❑ In the body of an algorithm various programming constructs like **if, for, while** and some statements like assignments are used.
- ❑ The compound statements may be enclosed with { and } brackets. **if, for, while** can be closed by **endif, endfor, endwhile** respectively. Proper indention is must for block.
- ❑ The **identifier** should begin by a letter and not by digit. It contains alpha numeric letters after first letter. No need to mention data types.
- ❑ Input and Output can be done using **read** and **write**.



# Assessment

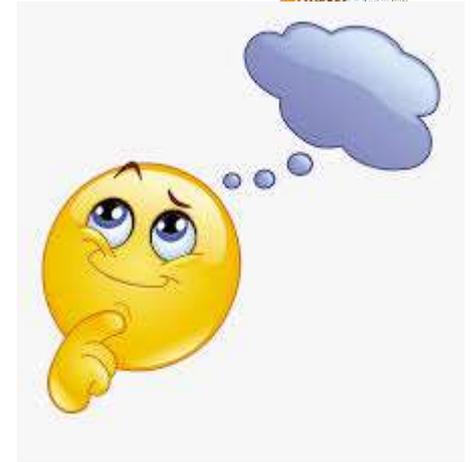


1. Which one is not a characteristic of an Algorithm?

- a) Ambiguity
- b) Definiteness
- c) Finiteness
- d) Efficiency

2. Write the two parts in writing an Algorithm

- i)-----
- ii)-----





Thank you!

