

ARTICLE TITLE:

“Algorithm and Its Complexity”

ALGORITHM:

An Algorithm is a term used frequently in the field of Computer Sciences. It can be defined as,

"A finite step-by-step list of well-defined instructions for solving a particular problem."

The format for the formal presentation of an algorithm consists of two parts. The first part is a paragraph which tells the purpose of the algorithm, identifies the variable which occurs in the algorithm and lists the input data. Whereas the second part of the algorithm consists of the list of steps that is to be executed. Let's have a simple example of an algorithm to make it more clear.

Example:

A non-empty array DATA with N numerical values is given. This Algorithm finds the location LOC and MAX gives the location and value of the largest element of DATA. The variable K is used as a counter.

Step 1: [Initialize] Set $K=1$, $LOC=1$ and $MAX= DATA[1]$.

Step 2: [Increment counter] Set $K=K+1$.

Step 3: [Test counter] If $K>N$, then: Write: LOC, MAX, and Exit.

Step 4: [Compare and update] If $MAX<DATA[K]$, then: Set $LOC= K$ and $MAX=DATA[K]$.

Step 5: [Repeat Loop] Go to Step 2.

COMPLEXITY OF AN ALGORITHM:

The analysis of an algorithm is considered as a vital task in Computer Science. In order to compare algorithms, we must have some criteria to measure the efficiency of our algorithms. Therefore, we have an entity known as Complexity Of an Algorithm, which helps us analyze our algorithm with respect to space and time.

The complexity of an algorithm M is the function $f(n)$ which gives the running time and storage capacity requirement of the algorithm in terms of the size n of the input data. Frequently, the storage capacity required by an algorithm is simply a multiple of data size n . Accordingly, the term "complexity" shall refer to the running time of an algorithm.