UNIT - V

Sorting and Searching

Introduction to Algorithm Analysis:

→ Analysis of Algorithm is the process of finding the Computational Complexity of algorithms. (amount of time, space, other resources needed to execute them).

→ Types of Alg analysis

Best Case (less time)
Worst Case (long time)
Average Case. (Random time interval)

→ why analysis important:

→ Important part of Computational Complexity theory,

→ Theoretical estimation of ~~time~~ required resources to solve a specific Computational problem.

→ Determine amount of time & space to execute given problem.

Asymptotic Notation.

→ Used to describe the running time of an algorithm.

→ Three different Notations

① big O

② big Theta Θ

③ big Omega Ω

Big oh (O) Notation:

* It is denoted by the symbol O. i.e, the method of representing the upper bound of the alg's running time using big-oh Notation.

Def:

Let f(n) and g(n) be two non-empty functions. let n_0 and Constant 'c' are two integers such that n_0 denotes same value of input and $n > n_0$, similarly 'c' is a Constant such that $c > 0$, we can write $f(n) \leq c * g(n)$.

Omega Notation (Ω) (Best Case)

A function $f(n)$ is said to be $\Omega(g(n))$ if $f(n)$ is bounded below by some positive constant multiple of $g(n)$, such that $f(n) \geq c * g(n) \; \forall \; n > n_0$

big Theta Notation (Θ)

let $f(n)$ and $g(n)$ be two non-negative function. There are two positive constant c_1, c_2

$c_1 * g(n) \leq c_2 * g(n)$