**Time and Space Complexity**

**Time Complexity:**

* It is the amount of time taken by an algorithm to run.
* As a function of length of the input.

**Why?** For taking better Program**.** Comparison of Algorithm

**Big O Notation ->** Upper Bound => max-to-max

**Theta Θ ->** Average Case => mid-to-mid

**Omega Ω** **->** Lower Bound => min-to-min

**Time Complexity:**

Constant time -> **O(1)** for(int i=0 -> **10)** { “Hello world” }

Logarithm time -> **O(logn)** **Binary Search**

Linear time -> **O(N)** for(int i=0 -> **N)** { “Hello world” }

Quadratic time -> **O(N2)**  for(int **i=0** -> **N)**

for(int **j=0** -> **N)**

Cubic time -> **O(N3)**  for(int **i=0** -> **N)**

for(int **j=0** -> **N)**

for(int **k=0** -> **N)**

**O(N+M)** for(int i=0 **-> N)**

for(int i=0 **-> M)**

**Space Complexity:**

**O(1)** in a, int b; arr[5];

**O(N)** int n; cin>>n; vector<int> V(N);