# **UNDERSTANDING ASYMPTOTIC NOTATIONS**

1. **Explain Big O notation and how it helps in analyzing algorithms**

**Ans:** BigO notation is a way to measure how an algorithm's performance changes as the input size grows. It helps us in understanding of time complexity that how fast the algorithm runs and in space complexity that how much memory it uses .

The way it helps in analyzing algorithms is by : efficiency comparison and performance prediction .

1. **Describe the best,average and worst-case scenarios for search operations**

Ans**:** Best Case : The element is found immediately

Time Complexity**:** O(1) (constant time).

Average Case : The element is found somewhere in themiddle

Time Complexity:

* + - Linear Search: O(n/2) ≈ O(n)
    - Binary Search: O(log n)

Worst Case : The element is not present or is at the end of the dataset.

Time Complexity:

* + - Linear Search: O(n)
    - Binary Search: O(log n)