**Understading and Analysis**

1. Understanding Asymptotic Notation:

Big O notation is a way to describe the time complexity of a program or an algorithm. It is used to find bottlenecks in the program, predict the performance of the program on larger inputs and compare different approaches for the program independent of the hardware.

Best Case: Search item found immediately

Worst Case: Search item is present at the last or is not found

Average Case: Search item found somewhere in the middle of the data

1. Analysis:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Best case** | **Worst case** | **Average case** |
| Linear Search | O(1) | O(n) | O(n) |
| Binary Search | O(1) | O(logn) | O(logn) |

Linear search works by scanning each element one by one trying to find a match.It is quite simple but in-efficient for large data-sets.

In Binary search, target element is found by diving the array in half at each iteration and thus reducing the number of iterations made to find the element. It is highly efficient but works only in sorted data-sets.

In our case, binary-search would be more efficeint given that data-set is always sorted, else linear seach is recomeded.