**E-commerce Platform Search Function**

**1. Understand Asymptotic Notation:**

a. Big O Notation:

Big O notation is a mathematically defined manner of analysing an algorithm for its time or space complexity that defines the manner in which the execution time or memory of an algorithm increases with amount of input.

b. possible, average and least favorable situations with regards to search operations.

In the case of search operations, the best, average and worst-case cannot be explicitly defined as such are pegged on the algorithms used in facilitating such operations.

• Best Case: The case where the search minimally requires steps or can be referred to as the minimal acyclic search.

• Average Case: This is the case that illustrates the number of steps the search is likely to make most of the time.

• Worst Case: The worst aspect of the search is where it demands the maximum number of steps from the criterion.

**4. Analysis:**

**Time Complexity Comparison:**

1. Linear Search: O(n), In linear search chance of searching the target element can be as many as elements in the array. The worst case would be where the target is at the last position of an array or is not present in it, we will have to search for all n elements.

2. Binary Search: O(log n), This is because binary search narrows the search from a given interval in half in every step. This logarithmic time complexity is easier and in many cases, much more efficient than linear search especially on large lists. However, it does impose certain conditions on the array to be sorted that include both the low and high indices to be between the first and last elements of the array.

**Suitability:**

1. Linear Search: Thus, Linear search is best for the unsorted data or the data which are frequently updated, Small data set since it does not require any preprocessing. It is very easy to implement but it becomes slower for very large sorted lists as compared to Binary Search.

2. Binary Search: Binary search is great fun with a sorted data and is ideal for static lists which you intend to search frequently, it is many times faster on large data sets. Unlike linear search its efficiency arises from the way it narrows the search area rapidly.