**E-commerce Platform Search Function**

**1. Understand Asymptotic Notation:**

**Big O Notation:**

Big o notation, a mathematical representation of efficiency of algorithm

in terms of time and space complexity. It provides an upper bound on growth

of the algorithm.

**Purpose:**

It helps us to compare the efficiency of various algorithms, thus helps us to

Find the optimized solutions!

**Best, Average and Worst-Case Scenarios for search operation**

**Best case:**

It indicates the least time that a search operation require to find the element

It takes O(1) provided that the first element itself is the element to be searched

In case of Linear search.

**Average case**:

It indicates the average time that a search operation require to find the element

It takes O(n/2) provided that the element is present at the middle in case of

Linear Search.

**Worst Case:**

It indicates the highest amount of time that a search operation require to find the element

It takes O(n) provided that the element to be searched is the last element

Of an array

In case of linear search.

**Analysis:**

**Time complexity analysis**

Linear Search:

Best case: O(1) – when the first element is the target element

Average case: O(n) – when the middle element is the target element

Worst case: O(n) – when the last element is the target element

Binary Search:

Best case: O(1) – when the middle element is the target element

Average case: O(logn) – when the element is found after repetitive halving

Worst case: O(logn) – when the target element is not found

Which is suitable?

Linear Search:

It is suitable for small datasets. But for E-commerce platforms we use large data

So it may not be preferable for this case.

Also it’s average and worst case complexity are O(n) which is not better than the

Average and worst case complexity of binary search which is O(logn).

Binary Search:

It is preferable as it is better than linear search under the consideration of

Average and worst case scenario though it have sorting as overhead.