Exercise 2: E-commerce Platform Search Function

1. Understand Asymptotic Notation:

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

= Big O notation is a mathematical representation used to describe the efficiency of an algorithm in terms of time and space complexity. It provides an upper bound on the growth rate of an algorithm's running time or space requirements as the input size increases.

How->

1. Predicting Performance 2.Comparing Algorithms

3. Optimizing Code

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

= Best-case scenario: The minimum time an algorithm takes to complete.

Average-case scenario: The expected time an algorithm takes to complete, averaged over all possible inputs.

Worst-case scenario: The maximum time an algorithm takes to complete.

4. Analysis:

o Compare the time complexity of linear and binary search algorithms.

= Time Complexity Analysis:

Linear Search:

Best-case: O(1)

Average-case: O(n)

Worst-case: O(n)

Binary Search:

Best-case: O(1)

Average-case: O(log n)

Worst-case: O(log n)

o Discuss which algorithm is more suitable for your platform and why.

= Suitability: For an e-commerce platform, binary search is more suitable due to its logarithmic time complexity but, it requires the data to be sorted. If the dataset is small or unsorted, linear search might be simpler to implement.