Exercise 2: E-commerce Platform Search Function

1. Understanding Asymptotic Notation:

Asymptotic Notation (Big O) is a mathematical notation used to describe the performance or complexity of an algorithm in terms of input size (n).

It helps developers predict how an algorithm will scale and guides decisions on which algorithm to use.

Common Notations:

- O(1): Constant time

- O(log n): Logarithmic time

- O(n): Linear time

- O(n log n): Linearithmic time

- O(n^2): Quadratic time

Search Operation Scenarios:

- Best Case: The item is found at the first position.

- Average Case: The item is somewhere in the middle.

- Worst Case: The item is at the end or not found at all.

For Linear Search:

- Best: O(1)

- Average: O(n/2) => O(n)

- Worst: O(n)

For Binary Search (on a sorted array):

- Best: O(1)

- Average: O(log n)

- Worst: O(log n)