**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:*

* Big O notation is a mathematical notation used in computer science to describe the upper bound or worst-case scenario of the runtime complexity of an algorithm in terms of the input size.
* It uses algebraic terms to describe the complexity of an algorithm. Big O defines the runtime required to execute an algorithm by identifying how the performance of your algorithm will change as the input size grows.

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

*Linear Search:*

Best Case: O(1) - The element is the first one.

Average Case: O(n) - The element is somewhere in the middle.

Worst Case: O(n) - The element is the last one or not present.

*Binary Search (requires sorted array):*

Best Case: O(1) - The element is the middle one.

Average Case: O(log n) - The element is somewhere in the array, requiring repeated halving.

Worst Case: O(log n) - The element is not present, requiring repeated halving until the array is exhausted.

**4. Analysis:**

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

*Linear Search:*

Best Case: O(1) - The element is the first one.

Average Case: O(n) - The element is somewhere in the middle.

Worst Case: O(n) - The element is the last one or not present.

*Binary Search:*

Best Case: O(1) - The element is the middle one.

Average Case: O(log n) - The element is somewhere in the array, requiring repeated halving.

Worst Case: O(log n) - The element is not present, requiring repeated halving until the array is exhausted.

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

For this code as the data is provided and sorted binary search is preferrable.