**Exercise 2 : E-commerce Platform Search Function**

**🡪 Understanding Asymptotic Notation and Big O Notation**

**1. Asymptotic Notation**

* **Big O Notation:**  
  Big O is a mathematical way to express how the runtime or space requirement of an algorithm grows as the input size increases. It helps evaluate and compare algorithm efficiency independently of specific machines or environments.
* **Best, Average, and Worst Case:**
* **Best Case:** The scenario where the algorithm performs the fewest steps (e.g., the item is found at the beginning).
* **Average Case:** Represents the typical performance, averaged over all possible inputs.
* **Worst Case:** The scenario where the algorithm takes the most time (e.g., item is not found at all).

🡪**Analysis**

* **Time Complexity:**

| **Algorithm** | **Best Case** | **Average Case** | **Worst Case** |
| --- | --- | --- | --- |
| **Linear Search** | **O(1)** | **O(n/2)** | **O(n)** |
| **Binary Search** | **O(1)** | **O(log n)** | **O(log n)** |

* **Suitability:**
  + **Linear Search** is simple but slow for large datasets.
  + **Binary Search** is much faster but requires the array to be sorted.
  + For fast performance and a better shopping experience, **binary search is usually the better choice** for E-Commerce platform.
* **Implementation of E-Commerce Platform Search**

**Please refer repository**