E-Commerce Platform

1. Big O notation:

* Big O notation describes the upper bound of the running time or space used by an algorithm in terms of the input size ‘n’.
* It Describes the worst case scenario for an algorithm to complete it’s execution

2. Best case for Search operations:

* This is the scenario where the element is found in the first step itself

3. Average case for Search operations:

* This is the scenario where the element is found later in the searching process

4. Worst case for Search operations:

* This is the scenario where the element is not found in the array

5. Linear search vs Binary search:

1. Best case:

* Linear search: O(1), this happens when the target element is present at the very first index
* Binary search: O(1), this happens when the length of array is odd and target element is present at exactly middle

1. Average case:

* Linear search: O(n) , this happens when the element is somewhere in the array except the very first index
* Binary search: O(log n), this happens when the element is somewhere in the array except in the middle

1. Worst case

* Linear search: O(n), this happens when the target element is not present in the array
* Binary search: O(log n), this happens when the target element is not present in the array

6. Analysis:

* Linear Search is simple and flexible, ideal for small datasets or unsorted data.
* Binary Search is significantly faster for large datasets but requires sorted data, which may introduce overhead if data changes frequently.