## E-Commerce Platform

1. Big O notation:

* Big O notation gives the upper limit of the running time or space consumed by an algorithm as a function of the size of the input 'n'.
* It Gives the worst case scenario for completing an algorithm

2. Best case for Search operations:

* This is the case where the element is present in the first step itself

3. Average case for Search operations:

* This is the case where the element appears later in the searching process

4. Worst case for Search operations:

* This is the case where the element is not present in the array

5. Linear search vs Binary search:

a. Best case:

* Linear search: O(1), this occurs when the target element appears at the first index itself
* Binary search: O(1), this occurs if array length is odd and target element at exactly middle

b. Average case:

* Linear search: O(n), this occurs if the element in anywhere of the array except the first index
* Binary search: O(log n), this occurs if the element is anywhere of the array except in the middle

c. Worst case

* Linear search: O(n), this occurs when the target element is not in the array or the target element is the last element in the array.
* Binary search: O(log n), this occurs when the target element is not in the array or the target element is found after the maximum number of iterations where it is the only one left in the search space.

6. Analysis:

* Linear Search is easy and versatile, best for tiny data or unordered data.
* Binary Search is much faster for large data but needs sorted data, which can add overhead if data is often modified.