Exercise 2: E-commerce Platform Search Function

Asymptotic Notation

O(big O Notation)
It describes the upper bound of the algorithm. It tells the worst possible performance.
It ignores lower order terms and constants.
E.g - if some algo iterates 2 times over the array then its taking 2n time. So the time complexity becomes O(n).

Best, Average and Worst Case scenarios of Searching algorithm

Linear Search
Best case - Element is found at 1st comparison(1st position)
Taking constant time i.e O(1)
Average case - Element is found somewhere in the middle
Taking linear time i.e O(n)
Worst case - Element is not present or found at last place
Taking linear time i.e O(n)

Binary Search
Best case - Element is found at 1st comparison(middle position)
Taking constant time i.e O(1)
Average case - Element is not at middle position
Taking logarithmic time i.e O(log n)
Worst case - Element is not present or somewhere other than middle position
Taking logarithmic time i.e O(log n)

Analysis
Linear search iterates on array sequentially, checking for each element
Which takes linear time i.e O(n).
Whereas, binary search cuts the search space into half each time
Which takes logarithmic time i.e O(log n). Which is better than linear search, taking less time.

Suitable Algorithm for E-commerce platform
Binary search only works for sorted search space. So, if products are sorted by their name then binary search is better option but if not then linear search is appropriate.