# Exercise 2: E-commerce Platform Search Function

## Problem Statement

Develop a product search feature that supports both linear and binary search algorithms for an e-commerce platform.

## Big O Notation

Big O notation describes how the time or space complexity of an algorithm increases with input size.

Common complexities: O(1) – Constant, O(log n) – Logarithmic, O(n) – Linear, O(n^2) – Quadratic

## Linear Search

Time Complexity: O(n)

Best Case: O(1), Worst Case: O(n)

Works on unsorted arrays.

## Binary Search

Time Complexity: O(log n)

Requires sorted data.

More efficient for large datasets.

## Class & Attributes

class Product {  
 int productId;  
 String productName;  
 String category;  
}

## Algorithm Analysis

Linear Search: Sorted Required - No, Time Complexity - O(n)

Binary Search: Sorted Required - Yes, Time Complexity - O(log n)

## Conclusion

Use Linear Search for small or unsorted lists.

Use Binary Search for large datasets to improve performance.