**Understanding Search Algorithm**

**Linear Search**

• Checks each element one by one from start to end.  
• Works on both sorted and unsorted data.  
• Simple to implement but slow for large datasets.  
• Stops when the element is found or end is reached.  
• Time Complexity: O(n)  
• Space Complexity: O(1)

**Binary Search**

• Works only on sorted arrays or lists.  
• Divides the array into halves repeatedly to search.  
• Compares the target with the middle element.  
• If target < mid → search left half; else → right half.  
• Much faster than linear search for large data.  
• Time Complexity: O(log n)  
• Space Complexity: O(1) (iterative), O(log n) (recursive)