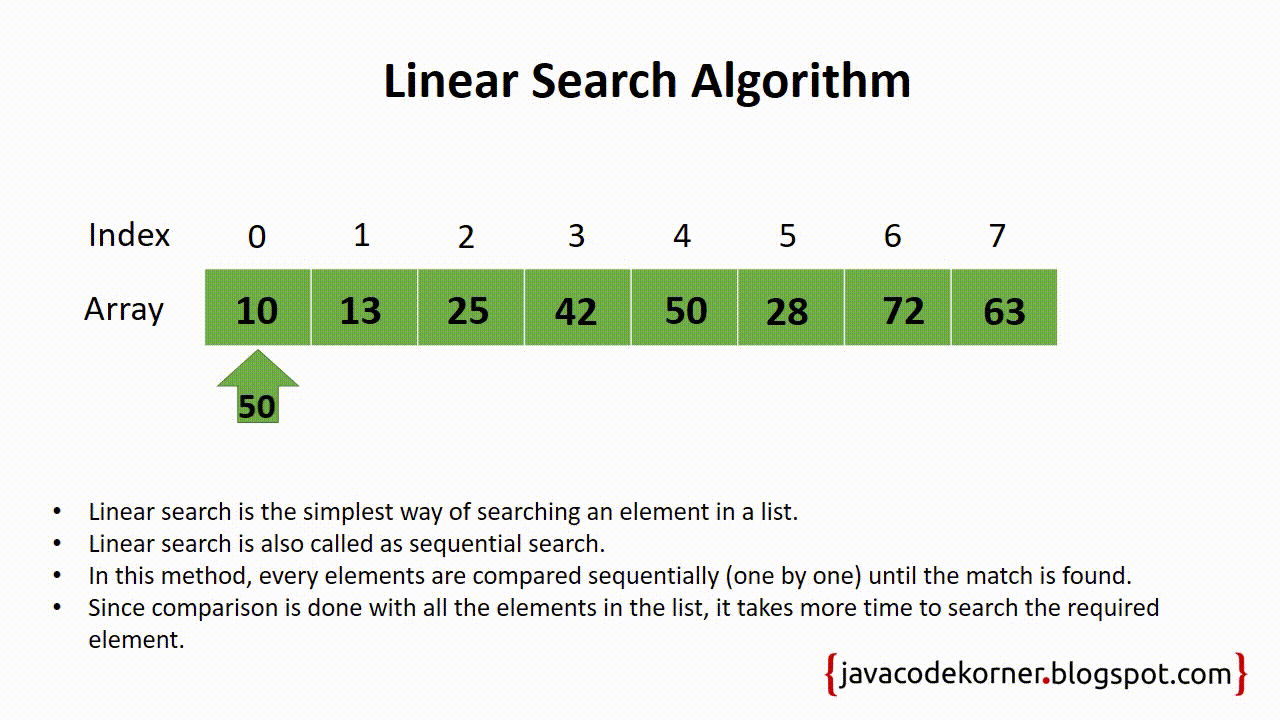
**1)Concept:**

### *Linear search:-*

*• Linear search is the simplest method for searching.  
• In Linear search technique of searching; the element is searched sequentially in the list.  
• This method can be performed on a sorted or an unsorted list (usually arrays).  
• In case of a sorted list searching starts from 0th element and continues until the element is   
found from the list or the element whose value is greater than (assuming the list is sorted in   
ascending order), the value being searched is reached.*

**

*• As against this, searching in case of unsorted list also begins from the 0th element and  
continues until the element or the end of the list is reached.  
• The linear search algorithm searches all elements in the array sequentially.  
• Its best execution time is 1, whereas the worst execution time is n, where n is the total   
number of items in the search array.  
• It is the most simple search algorithm in data structure and checks each item in the set of   
elements until it matches the search element until the end of data collection.  
• When data is unsorted, a linear search algorithm is preferred.*

*Linear Search is defined as a sequential search algorithm that starts at one end and goes through each element of a list until the desired element is found, otherwise the search continues till the end of the data set. It is the easiest searching algorithm*

**2)Algorithm:**

**Linear Search Algorithm**  
Step 1: First, read the search element (Target element) in the array.  
Step 2: In the second step compare the search element with the first element in the array.  
Step 3: If both are matched, display “Target element is found” and terminate the Linear Search   
function.  
Step 4: If both are not matched, compare the search element with the next element in the array.  
Step 5: In this step, repeat steps 3 and 4 until the search (Target) element is compared with the   
last element of the array.  
Step 6 – If the last element in the list does not match, the Linear Search Function will be   
terminated, and the message “Element is not found” will be displayed.

**3)Performance:**

**Time complexity and space complexity**

* Best Case Time Complexity of Linear Search: O(1)
* Average Case Time Complexity of Linear Search: O(N)
* Worst Case Time Complexity of Linear Search: O(N)
* Space Complexity of Linear Search: O(1)
* Number of comparisons in Best Case: 1
* Number of comparisons in Average Case: N/2 + N/(N+1)
* Number of comparisons in Worst Case: N

4) Application of Linear Search Algorithm

The linear search algorithm has the following applications:

* Linear search can be applied to both single-dimensional and multi-dimensional arrays.
* Linear search is easy to implement and effective when the array contains only a few elements.
* Linear Search is also efficient when the search is performed to fetch a single search in an unordered-List.