



Linear Search



Linear search is a type of sequential searching algorithm. In this method, every element within the input array is traversed and compared with the key element to be found.



Linear Search

Find '20'

0	1	2	3	4	5	6	7	8
10	15	30	70	80	60	20	90	40

Pseudocode

```
procedure linear_search (list, value)
  for each item in the list
    if match item == value
      return the item's location
    end if
  end for
end procedure
```



Linear search method may take key value that you are looking for and collection to its method. According to what you want to accomplish you may decide on return type.

Analysis

→ Linear search traverses through every element sequentially therefore, the best case is when the element is found in the very first iteration. The best-case time complexity would be **$O(1)$** .

→ However, the worst case of the linear search method would be an unsuccessful search that does not find the key value in the array, it performs n iterations. Therefore, the worst-case time complexity of the linear search algorithm would be **$O(n)$** .

When to use Linear Search:

→ When there is small collection of data.

→ When data is unordered.

Advantages of Linear Search Algorithm:

→ Linear search can be used irrespective of whether the array is sorted or not. It can be used on arrays of any data type.

→ Does not require any additional memory.

→ It is a well-suited algorithm for small datasets.

Disadvantages of Linear Search Algorithm:

→ Linear search has a time complexity of $O(N)$, which in turn makes it slow for large datasets.

→ Not suitable for large arrays.



Java implementation can be found under Implementation_Java folder



References

Linear Search Algorithm - GeeksforGeeks


Learn the fundamentals of Linear Search Algorithm: its working, implementation, complexity analysis, applications, advantages and disadvantages.

 <https://www.geeksforgeeks.org/linear-search/>



Binary Search Algorithm


Binary Search Algorithm - Binary search is a fast search algorithm with run-time complexity of $O(\log n)$. This search algorithm works on the principle of divide and conquer, since it divides the array into half before searching. For this algorithm to

 https://www.tutorialspoint.com/data_structures_algorithms/binary_search_algorithm.htm



Introduction to Searching - Data Structure and Algorithm Tutorial - GeeksforGeeks

A Computer Science portal for geeks. It contains well written, well thought and well explained computer science and programming articles, quizzes and practice/competitive programming/company interview Questions.

 <https://www.geeksforgeeks.org/introduction-to-searching-algorithms-2/>



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SerhatKumas - Overview

Computer engineering student who loves coding in different fields instead of focusing on a one specific area. - SerhatKumas

 <https://github.com/SerhatKumas>

