Linear Search

In this tutorial, you will learn about linear search. Also, you will find working examples of linear search C, C++, Java and Python.

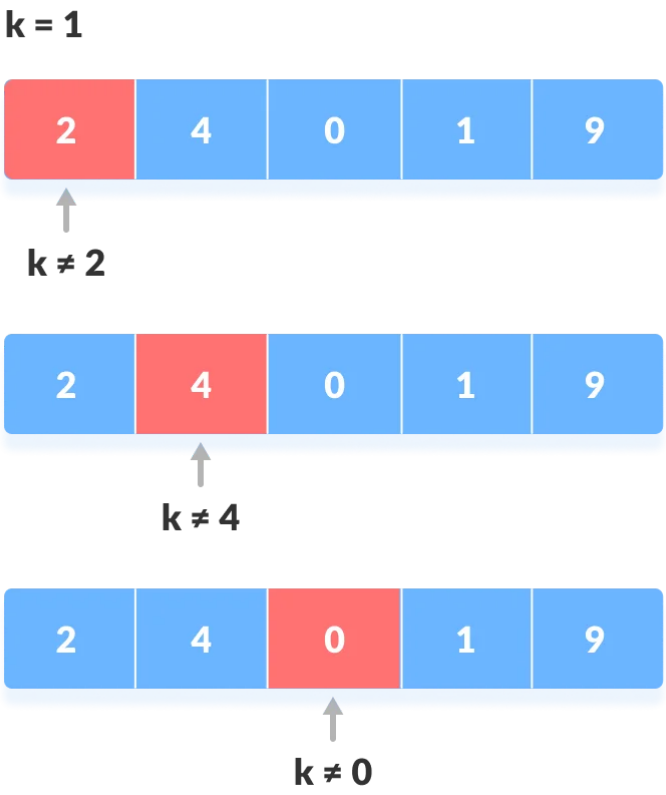
Linear search is a sequential searching algorithm where we start from one end and check every element of the list until the desired element is found. It is the simplest searching algorithm.

How Linear Search Works?

The following steps are followed to search for an element `k = 1` in the list below.

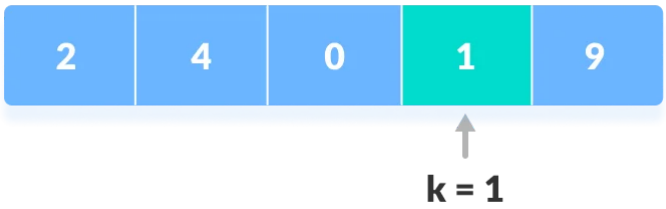
Array to be searched for

1. Start from the first element, compare `k` with each element `x`.



Compare with each element

2. If `x == k`, return the index.



Element found

3. Else, return `not found`.

Linear Search Algorithm

```
LinearSearch(array, key)
  for each item in the array
    if item == value
      return its index
```

Python, Java and C/C++ Examples

Python Java C C++

```c
// Linear Search in C

#include <stdio.h>

int search(int array[], int n, int x) {

  // Going through array sequencially
  for (int i = 0; i < n; i++)
    if (array[i] == x)
      return i;
  return -1;
}

int main() {
  int array[] = {2, 4, 0, 1, 9};
  int x = 1;
  int n = sizeof(array) / sizeof(array[0]);

  int result = search(array, n, x);

  (result == -1) ? printf("Element not found") : printf("Element found at index: %d",
}
```

Linear Search Complexities

Time Complexity: `O(n)`

Space Complexity: `O(1)`

Linear Search Applications

1. For searching operations in smaller arrays (<100 items).