LINEAR SEARCH

- Linear/Sequential Search —
- It is basic of simple search algorithm
- In sequential search, we compare the target value with all other elements given in the list

Example:

Find index of element 17 in array num[8, 12, 16, 17, 2]

```
Class Main {
    public static void main (String[] args) {
        int num = {8, 12, 16, 17, 2};
        Int index = findElement(num); //calling function to
        System.out.println (index);        find the index of
    }                                      element '17'.
    static int findElement (int[] arr) {
        for (int i=0; i< arr.length; i++) {
            if (arr[i] == 17)
                return i;
        }
        return -1
    }
}
```

Working

nums
arr

8	12	16	17	2
0	1	2	3	4

i=0   i=1   i=2   i=3

nums[3] = 17

return 3
(index)

Index value

If value of i in index of array is equal to 17 then return i — (index) else move forward

Time complexity

- Worst Case ⟶ O(N)

Size of Array	No. of comparisons	Time (ms)
100	100	100 ms
200	200	200 ms
N	N	N ms

time
(cms)
O(N) ← LINEAR TIME COMPLEXITY

400

300

200

100

100 200 300 400

Size

WORST CASE

- Best Case ⟶ O(1)

The target might be present at the first index. So the best case complexity is O(#) O(1)

time (ms)

400

300

200

100   O(1)   ← CONSTANT TIME COMPLEXITY

100 200 300 400

Size

- Average case ⟶ O(N)