Linear Search

Performing Linear Search

- Linear Search:
  - Is the simplest searching method
  - Is also referred to as sequential search
  - Involves comparing the items sequentially with the elements in the list

Implementing Linear Search

- The linear search would begin by comparing the required element with the first element in the list.
- If the values do not match:
  - The required element is compared with the second element in the list.
- If the values still do not match:
  - The required element is compared with the third element in the list.
- This process continues, until:
  - The required element is found or the end of the list is reached.

Implementing Linear Search (Contd.)

- Algorithm to search target in an array of N numbers using linear search algorithm

Algorith LinearSearch (target, arr[], N)

1. Set i = 0

2. while (i < n **or** arr[i] != target)
   2.1 increment i

3. If i = n
   3.1 Display “Not Found”
   else
   3.1 Display “Found at **i** position”

Determining the Efficiency of Linear Search

- The efficiency of a searching algorithm is determined by the running time of the algorithm.
- In the best case scenario:
  - The element is found at the first position in the list.
  - The number of comparisons in this case is 1.
  - The best case efficiency of linear search is therefore, O(1).
- In the worst case scenario:
  - The element is found at the last position of the list or does not exists in the list.
  - The number of comparisons in this case is equal to the number of elements.
  - The worst case efficiency of linear search is therefore, O(n).

Just a minute

- You have to apply linear search to search for an element in an array containing 5,000 elements. If, at the end of the search, you find that the element is not present in the array, how many comparisons you would have made to search the required element in the given list?

- Answer:
  - 5,000