**Design and Analysis of Algorithm**

**Experiment No. : 1**

**Write a program to implement Linear search using Recursion**

Experiment No. 1

1. **Aim:** Write a program to implement Linear Search using Recursion.
2. **Algorithm**

**Linear Search**

Searching is the process of finding some particular element in the list. If the element is present in the list, then the process is called successful, and the process returns the location of that element; otherwise, the search is called unsuccessful.

Linear search is also called as sequential search algorithm. It is the simplest searching algorithm. In Linear search, we simply traverse the list completely and match each element of the list with the item whose location is to be found. If the match is found, then the location of the item is returned; otherwise, the algorithm returns NULL.

It is widely used to search an element from the unordered list, i.e., the list in which items are not sorted. The worst-case time complexity of linear search is O(n).

1. Create an array of numbers by taking input from user.
2. Input an array of numbers and then apply the linear search algorithm to find the position of an element in an array, if it exists.
3. In order to look for an element in an array, we’ll go sequentially in increasing index values.
4. If we encounter the element requested by the user we will return the position of that element in array, but if it is not there we will return -1 which indicates the absence of element which was searched.

**Best case time complexity : O(1)**

Worst case time complexity : O(n)

Average case time complexity : O(n)

1. **Conclusion and Discussion:** Hence we have implemented Linear Search and Binary Search algorithm by using Recursive approach.