SEARCHING

Searching is to find a particular element in a list of elements. Following are some of the searching methods.

1. Linear Search
2. Binary Search

Linear Search (or) Sequential Search:

This is the simplest method of searching a data in an array. This can be applied in an unsorted array. Its time complexity is O (n).

Steps:

- In Linear search, we start the search from first location.
- If data found we stop otherwise search continues with next location.
- The above step is repeated until we reach the last location.
- Whenever we reach end of the list, the data is not found.

Example 1:

Consider the array elements: 3, 15, 12, 13, 8 and

Element to be searched = 13

Steps:

First we compare 13 with first element 3 - No match

Then compare 13 with second element 15 – No match

Then compare 13 with third element 12 – No match

Then compare 13 with fourth element 13 – Match.

Thus, the data found at location 4.

Example 2:

Consider the array elements: 3, 15, 12, 13, 8 and

Element to be searched (key) = 7

Steps:

First we compare 7 with first element 3 - No match

Then compare 7 with second element 15 – No match

Then compare 7 with third element 12 – No match

Then compare 7 with fourth element 13 – No match.

Then compare 7 with fifth element 8 – No match.

Now we reached the end of the list. So we say that "data not found".

Program: Linear Search

```
#include<stdio.h>
#include<conio.h>
void main()
{
   int a[10],i,n,m,c=0;
   printf("Enter the size of an array: ");
   scanf("%d",&n);
   printf("Enter the elements of the array: ");
   for(i=0;i<=n-1;i++)
        scanf("%d",&a[i]);
   printf("Enter the number to be searched: ");
        scanf("%d",&m);
   for(i=0;i<=n-1;i++)
   {
```

```
        if(a[i]==m)
        {
           printf("Element is in the position %d\n",i+1);
           c=1;
           break;
        }
    }
    if(c==0)
       printf("The number is not in the list");
    getch();
}
```

Output:

Enter the size of an array: 4

Enter the elements of the array: 4 3 5 1

Enter the number to be search: 5

Element is in the position 3