Practical # 09

Objective:

*Discuss linear search algorithm in data structure. **Design** a C++ program for linear search algorithm.*

Theory:

In this Lab, we discuss the linear search technique. Linear search algorithm finds a given element in a list of elements with **O(n)** time complexity where **n** is total number of elements in the list. This search process starts comparing search element with the first element in the list. If both are matched then result is element found otherwise search element is compared with the next element in the list. Repeat the same until search element is compared with the last element in the list, if that last element also doesn't match, then the result is "Element not found in the list". That means, the search element is compared with element by element in the list.

Linear search is implemented using following steps...

Step 1 - Read the search element from the user.
Step 2 - Compare the search element with the first element in the list.
Step 3 - If both are matched, then display "Given element is found!!!" and terminate the function
Step 4 - If both are not matched, then compare search element with the next element in the list.
Step 5 - Repeat steps 3 and 4 until search element is compared with last element in the list.
Step 6 - If last element in the list also doesn't match, then display "Element is not found!!!" and terminate the function.

Lab Objectives:

- To be able to write C++ program for linear search algorithm.

C++ program: Write C++ program for linear search algorithm.

```
// C++ Program to Implement Linear Search
#include<iostream>
using namespace std;
int main()
{
    int arr[10], i, num, index;
    cout<<"Enter 10 Numbers: ";
    for(i=0; i<10; i++)
        cin>>arr[i];
    cout<<"\nEnter a Number to Search: ";
    cin>>num;
    for(i=0; i<10; i++)
    {
        if(arr[i]==num)
        {
            index = i;
            break;
        }
    }
    cout<<"\nFound at Index No."<<index;
    cout<<endl;
    return 0;
}
```

```
Enter 10 Numbers:
10
11
12
1
3
6
5
22
7
8

Enter a Number to Search: 1

Found at Index No.3
```

Review Questions/ Exercise:

1. Implement linear search algorithm using function in C++.

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2. Implement linear search with duplicate element in C++.

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_____

Name: _____

Roll #: _____

Date: _____

Subject Teacher

Remarks: