

DAA Assignment 1

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Linear Search

1. Algorithm

Step1 Start.

Step 2: Input array elements.

Step 3: Input Key to be searched.

Step 4: Set i to 0.

Step 5: if $a[i] = \text{key}$ go to **step 8**.

Step 6: Increment i (i++).

Step 7: if $i \leq \text{len of array}$, go to **step 5** else go to **step 9**.

Step 8: Print element found at location i+1 go to **step10**.

Step 9: Print element not found.

Step 10: Exit.

2. Time Complexity

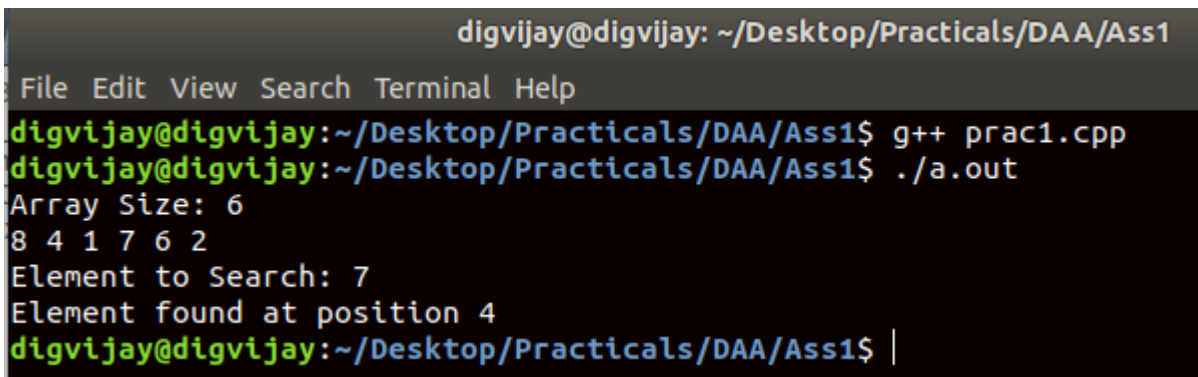
- > Best Case : $O(1)$ (if element found in first iteration)
- > Worst Case : $O(n)$ (if element found in last iteration/ not found)

3. Space Complexity : $O(1)$

4. *Code Implementation :*

```
#include<iostream>
using namespace std;
int main()
{
    int n,x;
    cout<<"Array Size: ";
    cin>>n;
    int a[n];
    for(int i=0;i<n;i++)
        cin>>a[i];
    cout<<"Element to Search: ";
    cin>>x;
    for(int i=0;i<n;i++)
    {
        if(a[i]==x)
        {
            cout<<"Element found at position "<<i+1<<endl;
            return 0;
        }
    }
    cout<<"Element not found"<<endl;
    return 0;
}
```

Output:



```
digvijay@digvijay: ~/Desktop/Practicals/DAA/Ass1
File Edit View Search Terminal Help
digvijay@digvijay:~/Desktop/Practicals/DAA/Ass1$ g++ prac1.cpp
digvijay@digvijay:~/Desktop/Practicals/DAA/Ass1$ ./a.out
Array Size: 6
8 4 1 7 6 2
Element to Search: 7
Element found at position 4
digvijay@digvijay:~/Desktop/Practicals/DAA/Ass1$ |
```