

Indian institute of Information Technology Bhopal
Computer Science and Engineering



ASSIGNMENT No.3

CSE SECTION 1

Design and analysis of algorithms

Submitted to:

Dr. Neeta Anna Eapen

Submitted by:

**Ashish singh
goutam**

24U020011

LAB 1 OF DAA

```
#include <bits/stdc++.h>

#include <chrono>

using namespace std;
using namespace std::chrono;

int main(){

    long long n;

    cout << "ENter array length: " << endl;
    cin >> n;
    vector<long long> arr;

    for(long long i=0; i< n ; i++){

        //cout<<"no. at index " << i << " : " << i;

        arr.push_back(arr[i]);
    }

    long long targ;

    cout << "Enter the no. to be searched: " << endl;
    cin >> targ;

    long long count =0;;

    //linear search

    auto start = high_resolution_clock::now();
```

```

for(long long i =0 ; i< n ; i++){

    count++;

    if(arr[i]==targ){
        cout << "Found at index " << i <<" using linear search." <<endl;

    }

}

autoend = high_resolution_clock::now();
autoduration = duration_cast<microseconds>(end - start);
cout<< "Execution time: " << duration.count() << " ms" << endl;

cout<< "No. of operations used: " << count <<" ";

//binary search
longlong count2=0;

intlow=0;
inthigh = n-1;
boolflag =0;
autostart2 = high_resolution_clock::now();
arr.sort(arr,arr+n);
while(low <= high){
    mid= (low + high)/2;

```

```

    if(arr[i]==arr[mid]){
        cout<<"Found at index " << i <<" using binary search." <<endl;
        flag = 1;
        break;

    }
    elseif(arr[i]< arr[mid]){
        high=mid-1;
    }
    else{
        low=mid+1 ;
    }
}

if(flag==0){
    cout<<"Target not found using binary search." << endl;
}

autoend2=high_resolution_clock::now();
autoduration2 = duration_cast<microseconds>(end2 - start2);
cout<<"Execution time for binary: " << duration.count() << " ms" << endl;

cout<<"No.of operations used: " << count2 <<" ";

}

```

OUTPUT:

ENter array length:

10

Enter the no. to be searched:

9

Found at index 9 using linear search.

Execution time: 0 ms

No. of operations used: 10

ENter array length:

100

Enter the no. to be searched:

99

Found at index 99 using linear search.

Execution time: 0 ms

No. of operations used: 100

ENter array length:

1000

Enter the no. to be searched:

999

Found at index 999 using linear search.

Execution time: 1190 ms

No. of operations used: 1000