

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;

intmain(){
    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