

Assignment No. 3

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Batch – T7

Problem Statement – To Implement different search techniques using array data structure

Code – Linear Search

```
#include <iostream>
#include <vector>
#include <algorithm>
using namespace std;

int main()
{
    srand(time(0));

    int n ;
    cout<<"Enter the size :";
    cin>>n;

    vector<int> arr(n);

    for(int i=0;i<n;i++)
    {
        int random = (rand() % 1000)+1;

        if(count(arr.begin(), arr.end(), random)>=1)
        {
            i--;
        }
        else
        {
            arr[i] = random;
        }
    }

    for(int i=0;i<n;i++)
    {
        cout<<arr[i]<<" ";
    }

    cout<<endl;
    cout<<"Enter key :";
    int key;
    cin>>key;
```

```

bool flag = false;

int ans ;
for(int i=0;i<arr.size();i++)
{
    cout<<"Comapiring key : "<<key<<" with element : "<<arr[i]<<endl;
    if(arr[i]==key)
    {
        ans =i;
        flag = true;
        break;
    }
}

if(flag)
{
    cout<<"Element found at index : "<<ans<<endl;
}
else
{
    cout<<"Element not found"<<endl;
}
}

```

Output-

```

Enter the size :10
374 52 643 739 617 425 603 35 829 823
Enter key :425
Comapiring key : 425 with element : 374
Comapiring key : 425 with element : 52
Comapiring key : 425 with element : 643
Comapiring key : 425 with element : 739
Comapiring key : 425 with element : 617
Comapiring key : 425 with element : 425
Element found at index :5

```

Code – Binary Search

```
#include <iostream>
#include <vector>
#include <algorithm>
using namespace std;

int main() {
    srand(time(0));

    int n ;
    cout<<"Enter the size :";
    cin>>n;

    vector<int> arr(n);

    for(int i=0;i<n;i++)
    {
        int random = (rand() % 1000)+1;

        if(count(arr.begin(), arr.end(), random)>=1)
        {
            i--;
        }
        else
        {
            arr[i] = random;
        }
    }

    for(int i=0;i<n;i++)
    {
        cout<<arr[i]<<" ";
    }

    cout<<endl;
    cout<<"Enter key :";
    int key;
    cin>>key;

    sort(arr.begin(), arr.end());

    int start = 0;
    int end = n-1;

    bool flag = false;

    while (start <= end) {
        int mid = start + (end - start) / 2;
```

```
    cout<<"Compairing mid element : "<<arr[mid]<<" with key element :"<<key<<endl;

    if (arr[mid] == key) {
        flag = true;
        break;
    } else if (arr[mid] < key) {
        start = mid + 1;
    } else {
        end = mid - 1;
    }
}

if (flag) {
    cout << "Element Found";
} else {
    cout << "Element not found";
}

return 0;
}
```

Output –

```
Enter the size :10
190 962 387 849 711 523 971 227 748 492
Enter key :962
Compairing mid element : 523 with key element :962
Compairing mid element : 849 with key element :962
Compairing mid element : 962 with key element :962
Element Found
```