

## **WEEK – 2**

### **Q 1.**

```
#include <iostream>

using namespace std;

int main() {

    int T;

    cin >> T;

    for (int i = 0; i < T; i++) {

        int n;

        cin >> n;

        int A[1000];

        for (int j = 0; j < n; j++) {

            cin >> A[j];

        }

        int flag = 0, comp = 0, key;

        cin >> key;

        for (int k = 0; k < n; k++) {

            comp++;

            if (A[k] == key) {

                flag++;

                cout << "Present "; break; }

        }

    }
```

```

if (flag == 0) cout << "Not present "; cout << comp << endl;

}

}

```

## OUTPUT:

The screenshot shows the OnlineGDB beta interface. The top bar includes a sidebar with navigation links (Create New Project, My Projects, Classroom, Learn Programming, Programming Questions, Logout) and a main editor area. The editor displays a C++ program (main.cpp) with the following code:

```

1- /*****
2  Q1) Given an array of nonnegative integers, design a linear algorithm and implement it using a program to
3  find whether given key element is present in the array or not. Also, find total number of comparisons for each
4  input case. (Time Complexity = O(n), where n is the size of input)
5  *****/

```

The output window shows the following results:

```

3
2
45 67
5
Not present 2
4
34 67 89 23
23
Present 4
3
50 40 30
40
Present 2

...Program finished with exit code 0
Press ENTER to exit console.

```

## Q 2.

```
#include<iostream>
```

```
using namespace std;
```

```
int main() {
```

```
int T;
```

```
cin >> T;
```

```
for (int i = 0; i < T; i++) {
```

```
int n;
```

```
cin >> n;
```

```
int A[1000];
```

```
for (int j = 0; j < n; j++)
```

```
cin >> A[j];
```

```
int flag = 0, comp = 0, key, mid, lower = 0, greater = n - 1;
```

```

cin >> key;

while (greater >= lower) {

    comp++;

    mid = lower + (greater - lower) / 2;

    if (A[mid] == key) { cout << "Present ";

flag++;

break;

    }

    else if (key > A[mid]) lower = mid + 1;

    else greater = mid - 1;

}

if (flag == 0)

    cout << "Not Present ";

    cout << comp << endl;

}

}

```

## OUTPUT:

OnlineGDB beta  
online compiler and debugger for c/c++

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Language C++

main.cpp

```

1 - /*****
2  Q2) Given an already sorted array of positive integers, design an algorithm and implement it using a
3  program to find whether given key element is present in the array or not. Also, find total number of
4  comparisons for each input case. (Time Complexity = O(nLogn), where n is the size of input).
5  *****/

```

input

```

2
3
23 45 67
23
Present 2
4
104 567 345 753

```

```

567
Present 1

```

...Program finished with exit code 0  
Press ENTER to exit console.

## Q 3.

```
#include<iostream>

#include<math.h>

int main() {

int n,e,point=0,prev=0;

printf("Enter the size of an array: ");

scanf("%d",&n);

int arr[n];

int step=(int)(sqrt(n));

printf("Enter the Elements in an array: ");

for(int i=0;i<n;i++) point=i;

for(int i=prev+1;i<=point;i++) {

if(arr[i]==e) { printf("Element found at the index %d ",i);

exit(0);

}

}

printf("Element Not found\n");

return 0;

}

}
```

**OUTPUT:**

OnlineGDB beta

online compiler and debugger for c/c++

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3

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Language C

main.c

```
1  /******
2  Q3 Given an already sorted array of positive integers, design an algorithm and implement it using a
3  program to find whether a given key element is present in the sorted array or not. For an array arr[n],
4  search at the indexes arr[0], arr[2], arr[4],... ,arr[2k] and so on. Once the interval (arr[2k] < key < arr[ 2k+1]
5  ) is found, perform a linear search operation from the index 2k to find the element key. (Complexity < O(n),
6  where n is the number of elements need to be scanned for searching):
7  *****/
8  #include<stdlib.h>
9  #include<math.h>
10 int
11 main ()
12 {
13     int n, e, point = 0, prev = 0;
14     printf ("Enter the size of an array: ");
15     scanf ("%d", &n);
16     int arr[n];
17     int step = (int) (sqrt (n));
18     printf ("Enter the Elements in an array: ");
19     for (int i = 0; i < n; i++)
```

input

```
Enter the size of an array:
5
Enter the Elements in an array:
10 20 30 40 50
enter the element to be searched :
54
Element Not found

...Program finished with exit code 0
Press ENTER to exit console.
```