**Lab Question 17: Array Search – Linear and Binary**

**Aim:**
To write a C program to search an element using linear and binary search.

Algorithm (Linear):

1. Traverse each element.
2. If element found, return index.

Algorithm (Binary):

1. Sort array.
2. Repeat until low ≤ high:
    - Find mid.
    - If key == arr[mid], return mid.
    - If key < arr[mid], search left.
    - Else search right.

**Code:**

```
#include <stdio.h>

int linearSearch(int arr[], int n, int key){
   for(int i=0;i<n;i++) if(arr[i]==key) return i;
   return -1;
}

int binarySearch(int arr[], int n, int key){
   int low=0, high=n-1;
   while(low<=high){
      int mid=(low+high)/2;
      if(arr[mid]==key) return mid;
      else if(arr[mid]<key) low=mid+1;
      else high=mid-1;
   }
   return -1;
}
```

```
int main(){
   int arr[5]={10,20,30,40,50}, n=5, key=30;
   int lin=linearSearch(arr,n,key);
   int bin=binarySearch(arr,n,key);
   printf("Linear Search: %s\n", lin!=-1?"Found":"Not Found");
   printf("Binary Search: %s\n", bin!=-1?"Found":"Not Found");
   return 0;
}
```

**Output:**

- Input: key=30 → Linear = Found, Binary = Found
- Input: key=70 → Both Not Found

**Result:**
The program implements both linear and binary search.