17. Array Search – Linear & Binary

Aim: To search an element using linear and binary search.

Algorithm:

1. **Linear Search: Compare key with each element until found.**
2. **Binary Search: Divide array into halves, search recursively.**

C Program:

```c
#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 l=0,r=n-1;

    while(l<=r){

        int mid=(l+r)/2;

        if(arr[mid]==key) return mid;

        else if(arr[mid]<key) l=mid+1;

        else r=mid-1;

    }

    return -1;

}
```

```c
int main(){

    int arr[]={1,3,5,7,9}, n=5;

    int key=7;

    printf("Linear Search index: %d\n", linearSearch(arr,n,key));

    printf("Binary Search index: %d\n", binarySearch(arr,n,key));

    return 0;

}
```

Sample Output:

Linear Search index: 3

Binary Search index: 3

Result:

Linear and binary search methods were successfully implemented.