

Aim:

Write a program to **search** the given element from a list of elements with **binary search** technique using **recursion**.

Note: Write the functions **read()**, **bubbleSort()**, **display()** and **binarySearch()** in **Program912a.c**

Source Code:**Program912.c**

```
#include <stdio.h>
#include "Program912a.c"
void main() {
    int a[20], n, key, flag;
    printf("Enter value of n : ");
    scanf("%d", &n);
    read1(a, n);
    bubbleSort(a, n);
    printf("After sorting the elements are : ");
    display(a, n);
    printf("Enter key element : ");
    scanf("%d", &key);
    flag = binarySearch(a, 0, n - 1, key);
    if (flag == -1) {
        printf("The given key element %d is not found\n", key);
    } else {
        printf("The given key element %d is found at position : %d\n", key, flag);
    }
}
```

Program912a.c

```
void read1(int a[],int n){
    printf("Enter %d elements :",n);
    for(int i=0;i<n;i++){
        scanf("%d", &a[i]);
    }
}
void bubbleSort(int a[], int n){
    for (int i=0;i<n-1;i++){
        for(int j=0;j<n-1-i;j++){
            if(a[j]>a[j+1]){
                int temp=a[j];
                a[j]=a[j+1];
                a[j+1]=temp;
            }
        }
    }
}
void display(int a[], int n){
```

```

        for(int i=0;i<n;i++){
            printf("%d ", a[i]);
        }
        printf("\n");
    }
    binarySearch(int a[], int left, int right, int key){
        while(left<=right){
            int mid=left+(right-left)/2;
            if(a[mid]==key){
                return mid;
            }else if(a[mid]<key){
                left=mid+1;
            }else{
                right=mid-1;
            }
        }
        return -1;
    }
}

```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter value of n : 5
Enter 5 elements : 33 55 22 44 11
After sorting the elements are : 11 22 33 44 55 11
Enter key element : 11
The given key element 11 is found at position : 0

Test Case - 2
User Output
Enter value of n : 4
Enter 4 elements : 23 67 45 18
After sorting the elements are : 18 23 45 67 24
Enter key element : 24
The given key element 24 is not found