LAB - 1:

LINEAR SEARCH:

PROGRAM:

```c
//Linear search
#include <stdio.h>
void main()
{
    int arr[100],search,i,n;
    printf("Enter the number of elements of the array: ");
    scanf("%d",&n);
    for(i=0 ; i<n ; i++)
    {
        printf("Enter the element %d: ",i+1);
        scanf("%d",&arr[i]);
    }
    printf("Enter the element to be searched: ");
    scanf("%d",&search);
    for(i=0 ; i<n ; i++)
    {
        if(arr[i] == search)
        {
            printf("The element is found at %dth place!",i+1);
            break;
        }
    }
    if(i == n)
    {
        printf("The element %d is not found",search);
    }
}
```

OUTPUT:

```
Enter the number of elements of the array: 4
Enter the element 1: 73
Enter the element 2: 77
Enter the element 3: 97
Enter the element 4: 100
Enter the element to be searched: 97
The element is found at 3th place!

=== Code Exited With Errors ===
```

BINARY SEARCH:

PROGRAM:

```c
//Binary Search
#include <stdio.h>
void main()
{
    int n, i, j, temp, arr[100], search, first, last, middle;
    printf("Enter the number of elements of the array: ");
    scanf("%d",&n);
    for(i=0 ; i<n ; i++)
    {
        printf("Enter the %dth element: ",i+1);
        scanf("%d",&arr[i]);
    }
    // Sorting the array
    for (i = 0 ; i < n-1 ; i++)
    {
        for (j = i+1; j<n; j++)
        {
            if (arr[i] > arr[j])
            {
                temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
```

```c
        }
    }
    printf("Sorted array in ascending order:\n");
    for (i = 0; i < n; i++)
    {
        printf("\n%d ", arr[i]);
    }

    printf("\nEnter the element to be searched: ");
    scanf("%d",&search);
    first = 0;
    last = n-1;
    middle = (first + last)/2;
    while(first <= last)
    {
        if(arr[middle] < search)
        {
            first = middle + 1;
        }
        else if(arr[middle] == search)
        {
            printf("The element %d is found at position %d",search,middle+1);
            break;
        }
        else
        {
            last = middle - 1;
        }
        middle = (first + last)/2;
    }
    if(first > last)
    {
        printf("The element %d is not found",search);
    }
}
```

OUTPUT:

```
Enter the number of elements of the array: 4
Enter the 1th element: 100
Enter the 2th element: 97
Enter the 3th element: 77
Enter the 4th element: 73
Sorted array in ascending order:

73
77
97
100
Enter the element to be searched: 97
The element 97 is found at position 3

=== Code Exited With Errors ===
```