

```

1 #include<stdio.h>
2 #include<time.h>
3 int LinearSearch(int arr[], int l, int r, int x)
4 {
5
6     if (r < l)
7         return -1;
8     if (arr[l] == x)
9         return l;
10    if (arr[r] == x)
11        return r;
12    return LinearSearch(arr, l+1, r-1, x);
13 }
14 int BinarySearch(int arr[], int l, int r, int x)
15 {
16     if (r >= l)
17     {
18         int mid = l + (r - l)/2;
19         if (arr[mid] == x) return mid;
20         if (arr[mid] > x) return BinarySearch(arr, l, mid-1, x);
21         return BinarySearch(arr, mid+1, r, x);
22     }
23 }
24 void main(){
25     int ch;
26     for(;;){
27         printf("\n1.Linear Search\n2.Binary Search\nEnter Choice:");
28         scanf("%d",&ch);
29         if(ch==1){
30             printf("---Linear Search---\n");
31
32             int search,c,n;
33             srand(time(0));
34             printf("Enter number of elements in array:");
35             scanf("%d",&n);
36             int array[n];
37             for(c=0;c<n;c++){
38                 array[c]=rand()%100;
39                 printf("The List is,\n");
40                 for(c=0;c<n;c++){
41                     printf("%d\n",array[c]);
42                 }
43                 printf("Enter a number to be searched:");
44                 scanf("%d",&search);
45                 clock_t start,end;
46                 start=clock();
47                 for (int c = 1; c <= 32767; c++) for (int d = 1; d <= 32767; d++) { }
48                 int index = LinearSearch(array, 0, n-1, search);
49                 end=clock();
50                 printf("Time Taken:%lf\n",(double)(end-start)/CLOCKS_PER_SEC);
51                 if (index != -1)
52                     printf("Element %d is present at position %d\n", search, index+1);
53                 else
54                     printf("Element %d is not present\n", search);
55             }
56         }
57         else if(ch==2){
58             printf("---Binary Search---\n");
59
60             int c, first, last, middle, n, search, a;
61             srand(time(0));
62             printf("Enter number of elements:");
63             scanf("%d", &n);
64             int array[n];
65             for(c=0;c<n;c++){
66                 array[c]=rand()%100;
67                 printf("The List is,\n");
68                 for(c=0;c<n;c++){
69                     printf("%d\n",array[c]);
70                 }
71                 for (int i = 0; i < n; ++i)
72                 {
73                     for (int j = i + 1; j < n; ++j)
74                     {
75                         if (array[i] > array[j])
76                         {
77                             a = array[i];
78                             array[i] = array[j];
79                             array[j] = a;
80                         }
81                     }
82                 }
83                 printf("The sorted list is,\n");
84                 for(c=0;c<n;c++){
85                     printf("%d\n",array[c]);
86                 }
87                 printf("\nEnter element to be searched:");
88                 scanf("%d", &search);
89                 clock_t start,end;
90                 start=clock();
91                 for (int c = 1; c <= 32767 ; c++) for (int d = 1; d <= 32767; d++) { }
92                 int index = BinarySearch(array, 0, n-1, search);
93                 end=clock();
94                 printf("Time Taken:%lf\n",(double)(end-start)/CLOCKS_PER_SEC);
95                 if (index != -1)
96                     printf("Element %d is present at position %d\n", search, index+1);
97                 else
98                     printf("Element %d is not present\n", search);
99             }
100         }
101     }
102 }

```

```
1.Linear Search
2.Binary Search
Enter Choice:1
---Linear Search---
Enter number of elements in array:400
The List is,
60
41
47
37
0
91
58
96
69
32
69
83
40
69
58
78
71
41
59
75
39
2
96
15
73
66
26
94
7
85
55
19
26
3
57
78
46
67
75
15
```

```
3
81
1
3
63
72
3
27
5
4
7
83
7
15
82
30
98
Enter a number to be searched:98
Time Taken:0.000003
Element 98 is present at position 400
```

```
1.Linear Search
2.Binary Search
Enter Choice:2
---Binary Search---
Enter number of elements:100
The List is,
39
9
23
9
4
7
98
79
82
48
88
31
50
69
95
25
24
86
86
20
```

74
75
75
77
78
78
79
80
80
81
82
83
84
86
86
87
87
88
89
90
91
92
92
92
94
94
95
95
97
97
98

Enter element to be searched:98

Time Taken:0.000002

Element 98 is present at position 100