

Computer Science and Engineering Faculty  
University of Information Technology and Sciences

# Assignment On

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Course code: CSE 214

Course Title: Algorithm Lab

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## Introduction:::

Linear search is a very basic and simple search algorithm. In Linear search, we search an element or value in a given array by traversing the array from the starting, till the desired element or value is found.

The time complexity of Linear search algorithm is  **$O(n)$** , we will analysis the same and see why it is  **$O(n)$**  after implementing it.

## Taking input from stdin after freopen():::

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    freopen("Output.text","w",stdout);
    long int i=0;
    int long Arr[10000];
    for(i=0;i<=10000;i++)
    {
        printf("%d ", i);
    }
    return 0;
}
```

Output - Notepad

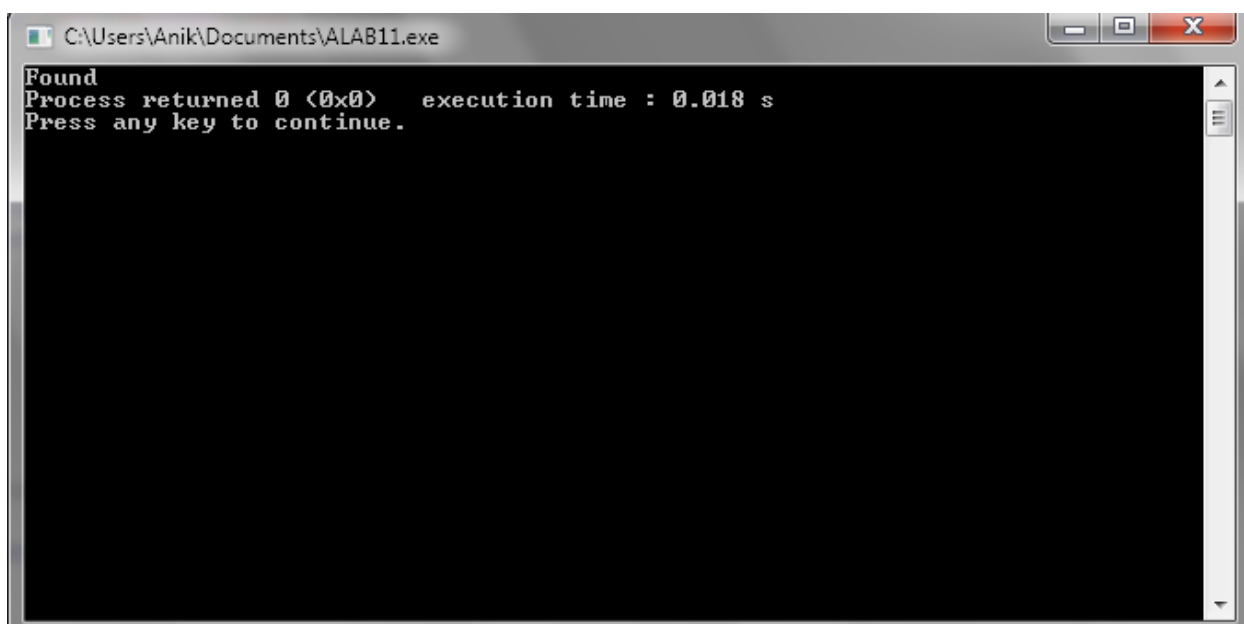
File Edit Format View Help

```
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
3 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
9 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556
5 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812
041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1
1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259
1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464
1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669
1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874
2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079
2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284
2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489
2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694
2886 2887 2888 2889 2890 2891 2892 2893 2894 2895 2896 2897 2898 2899
3091 3092 3093 3094 3095 3096 3097 3098 3099 3100 3101 3102 3103 3104
3296 3297 3298 3299 3300 3301 3302 3303 3304 3305 3306 3307 3308 3309
3501 3502 3503 3504 3505 3506 3507 3508 3509 3510 3511 3512 3513 3514
3706 3707 3708 3709 3710 3711 3712 3713 3714 3715 3716 3717 3718 3719
3911 3912 3913 3914 3915 3916 3917 3918 3919 3920 3921 3922 3923 3924
4116 4117 4118 4119 4120 4121 4122 4123 4124 4125 4126 4127 4128 4129
4321 4322 4323 4324 4325 4326 4327 4328 4329 4330 4331 4332 4333 4334
4526 4527 4528 4529 4530 4531 4532 4533 4534 4535 4536 4537 4538 4539
```

Ln 1, Col 1

## Using freopen to search a number:::

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    freopen("Output.text","r",stdin);
    long int i=0;
    long long arr[100001];
    for(i=0;i<=10000;i++)
    {
        int tm;
        scanf("%lld",&arr[i]);
    }
    long int src=101;
    for(i=0;i<=10000;i++)
    {
        if(arr[i]==src)
        {
            printf("Found");
            return 0;
        }
    }
    printf("Not Found");
    return 0; }
```



```
Found
Process returned 0 (0x0) execution time : 0.018 s
Press any key to continue.
```

# How to measure time taken by a function in C::

```
#include <stdio.h>
```

```
#include <time.h>
```

```
int main()
```

```
{
```

```
    clock_t st=clock();
```

```
    double cpu_time_used;
```

```
    int i,j,sum=0;
```

```
    for(j=1;j<=10000;j++)
```

```
    {
```

```
        for(i=1;i<=10000;i++)
```

```
        {
```

```
            sum++;
```

```
        }
```

```
    }
```

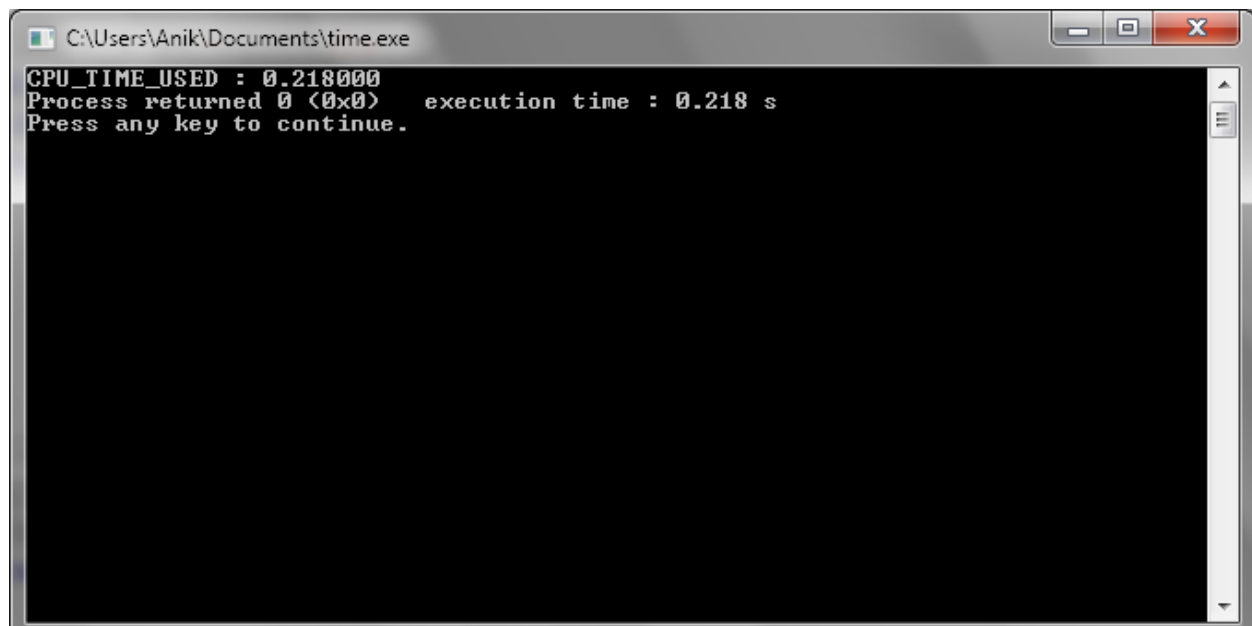
```
    clock_t en=clock();
```

```
    cpu_time_used = ((double)(en- st)) / CLOCKS_PER_SEC;
```

```
    printf("CPU_TIME_USED : %lf",cpu_time_used);
```

```
    return 0;
```

```
}
```



```
C:\Users\Anik\Documents\time.exe
CPU_TIME_USED : 0.218000
Process returned 0 (0x0)   execution time : 0.218 s
Press any key to continue.
```

## Conclusion:

We know Linear search is so damn simple to implement, but it is not used practically because binary search is a lot faster than linear search.