

```

1
2
3 lower_bound:
4
5     int l = -1;      /// a[mid] < x
6     int r = n;      /// a[mid] >= x
7
8     while(r > l+1)    /// <----- remember that line always( r > l+1 )
9     {
10         int mid = l+(r-l)/2;    /// No_overflow
11
12         if(arr[mid] < x)
13         {
14             l = mid ;
15         }
16         else
17             r = mid ;
18     }
19
20     cout << r+1<<"\n";    /// One_base_index
21
22
23
24 upper_bound:
25
26
27     int l = -1;    ///a[mid] <= x
28     int r = n;    ///a[mid] > x
29
30     while(r > l+1)
31     {
32         int mid = l+(r-l)/2;
33
34         if(arr[mid] <= x)
35         {
36             l = mid ;
37         }
38         else
39             r = mid ;
40     }
41
42     cout << l+1<<"\n";    /// Zero_base_index
43

```