Linear Search :- Performed in unsorted list.

- Searches for element sequentially starting from the first element.
- On an average we need n comparisons
- also called as sequential search.

```
Linear ( K, Size, Key)
    Repeat for i = 1 to Size
        if K[i] = Key
            //print element present
            Count = 1
            return
    if (Count = 1)
        print element present
    else
        print not found
```

2 MON

```
Recursive_Linear ( K, first, last, key)
    if (first > last)
        return -1
    else if K[first] = key
        return first
    else
        return Recursive_Linear (K, first+1, last, key)
```

Notes

Binary Search : → Sorted data.

3 TUE

↳ Applies d & c Strategy.

↳ Divides the array into sub array based on mid value

↳ Search is performed only on part of array.

↳ On an average n/2 comparisons to search an element

```
Binary_Search (K, size, key)
    left = 0
    right = size - 1
    while left <= right
        mid = (left + right) / 2
        If key = K[mid]
            return mid // element present
        Else if key > K[mid]
            left = mid + 1
        Else
            right = mid - 1.
```

```
Recursive_Binary (K, left, right, key)
    if left <= right
        mid = (left + right) / 2
        if key = K[mid]
            return mid // present
        else if key > K[mid]
            return Recursive_Binary (k, mid+1, right, key)
        else
            return Recursive_Binary (K, left, mid-1, key).
```

Example :- search 1

0	1	2	3	4	5	6	7
1	5	11	25	36	48	66	75

① $mid = \frac{0+7}{2} = \frac{6}{2} = 3.5 = 3$.

$mid \neq key$ $key < K[mid]$

$right = mid - 1 = 2$

② $left = 0$ $right = 2$

$mid = \frac{0+2}{2} = \frac{2}{2} = 1$

$mid \neq key$ $key < K[mid]$

$right = mid - 1 = 0$.

4 WED

③ $left = 0$ $right = 0$ ~~$mid = 0$~~.

$mid = \frac{0+0}{2} = \frac{0}{2} = 0$.

$mid = key$ ✓.

Example 2 :- Search 75

① $mid = 3$

② $mid = \frac{4+7}{2} = \frac{11}{2} = 5$

③ $mid = \frac{6+7}{2} = \frac{13}{2} = 6$.

④ $mid = \frac{7+7}{2} = \frac{14}{2} = 7$.

Notes