DSA through C++

Searching

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Agenda

1. Linear Search
2. Binary Search

Linear Search

	0	1	2	3	4	5	6	7	8	9
Array →	34	41	29	62	87	91	43	18	27	5

Item → 25 , 43

```
for (i=0; i<N; i++)
    if ( A[i] == Item)
        return i;

return -1;
```

Time Complexity of Linear Search

$$O(n)$$

Binary Search

0	1	2	3	4	5	6	7	8	9
35	40	29	18	90	87	62	53	61	59

Sort

0	1	2	3	4	5	6	7	8	9
18	29	35	40	53	59	61	62	87	90

$$m = \frac{l+u}{2} \qquad \frac{0+9}{2} = 4$$

$$O(\log_2 n)$$

```
if(A[m]==Item)
      return m;
if (Item < A[m])
          binary_search(A, l, m-1)
  else
      binary_search(A, m+1, u)
```