

## < 이진 탐색 ( Binary Search ) >

list 

0	1	2	3	4	5	6	7
1	3	4	5	7	9	11	13

11? 시간 복잡도:  $O(N)$

Diagram illustrating a linked list structure. The list contains nodes with values 1, 2, ..., 2. The indices 0, 1, 2, ..., 99999 are shown above the corresponding nodes. The list is labeled 'list' on the left, with an arrow pointing to the first node.

list

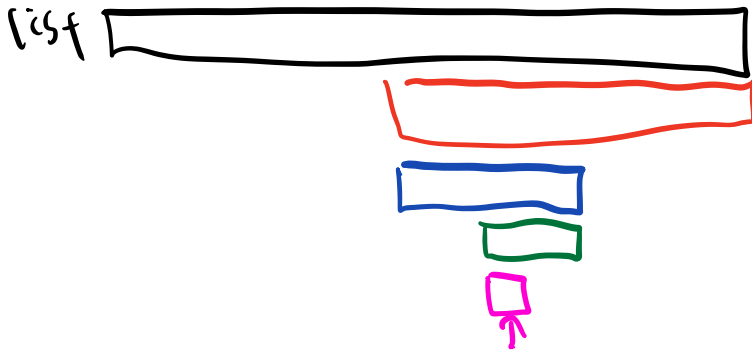
0	1	2	3	4	5	6	7	8
1	3	4	7	9	11	15	21	37

n?  $9/2 \Rightarrow 4$  6은 없나?

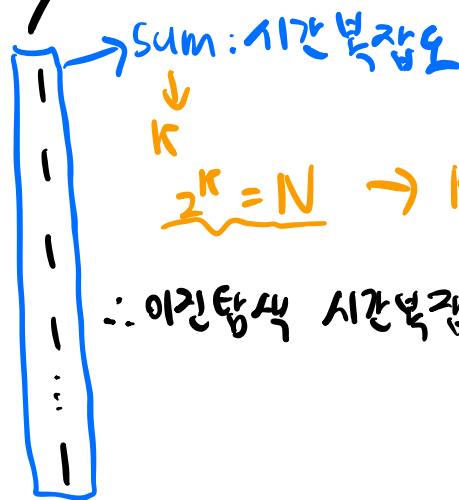
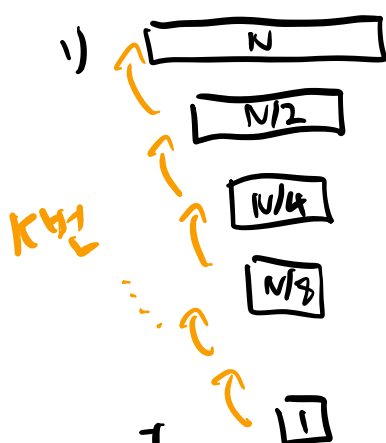
0	1	2	3
1	3	4	7

$$4/2 \Rightarrow 2$$
$$1/2 \Rightarrow 0$$

# < 이진탐색의 시간복잡도 >

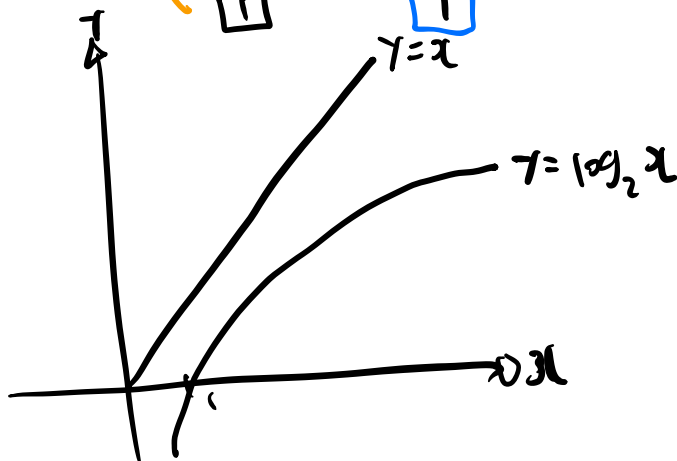


< input size = N >



$$2^K = N \rightarrow K = \log_2 N$$

$\therefore$  이진탐색 시간복잡도:  $O(\log N)$



$$N = 20억$$

$$O(N)$$

$$\downarrow$$
  

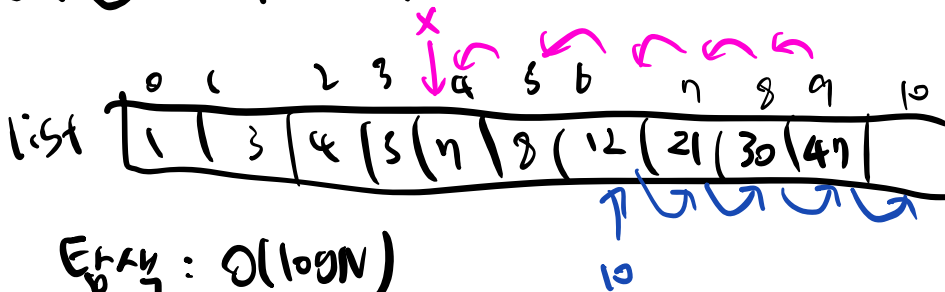
$$20억$$

vs

$$O(\log N)$$

$$\log_2 20억 \approx 30$$

<이분 탐색  $\rightarrow$  이진 탐색트리>



$$\text{탐색} : O(\log N)$$

$$\text{삽입} : O(\log N) + O(N) = O(N)$$

$$\text{삭제} : O(\log N) + O(N) = O(N)$$

< 이진 탐색 트리 (Binary Search Tree) > → 자식 최대 2

