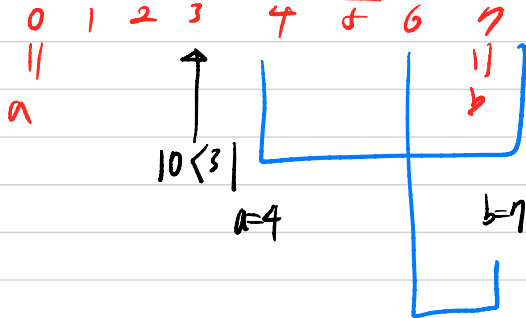


# 이진 탐색 (Binary Search)

$A = [2, 3, 9, 10, 17, 28, 31, 45]$



정렬 (오름차순)

$k=31$  (찾고 싶은)

$a=0, b=7$   $(a+b)//2 = 7//2 = 3$

$(4+7)//2 = 5$

$a=6, b=7$   $(6+7)//2 = 6$

$31=31$  find!

## <Pseudo Code>

```
def binary_search (A, start, end, k)
    if start > end:
        return -1
    m = (start + end) // 2
    if start < A[m]:
        return binary_search (A, start, m+1, k)
    elif m < A[m]:
        return binary_search (A, m-1, end, k)
    else:
        return m
```

## <수행시간 분석>

## 이진 탐색 절차식

$$T(n) = T(n/2) + C$$

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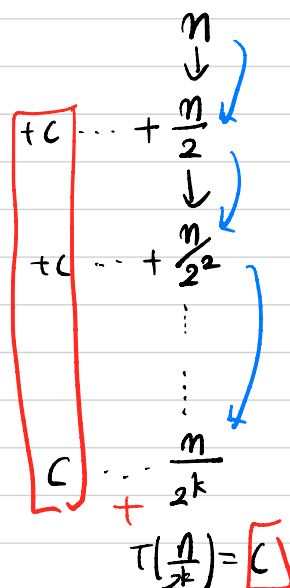
$$T(1) = C$$

$$\text{가정 } n = 2^k$$

$$\Rightarrow k = \log_2 n$$

$$T(n) = T(n/4) + 2C$$

$$= O(\log_2 n)$$



$k$ 번 재귀함  
 $\Rightarrow C$ 는  $k$ 번 생성  
 $= kC$  번 생성

$$T(n) = kC$$

$$= O(k)$$

$$= O(\log_2 n)$$