Searching — Find an element from an array.

↳ Linear Search, Binary Search.

arr=[] 40 7 24 42 51   ele = 42.
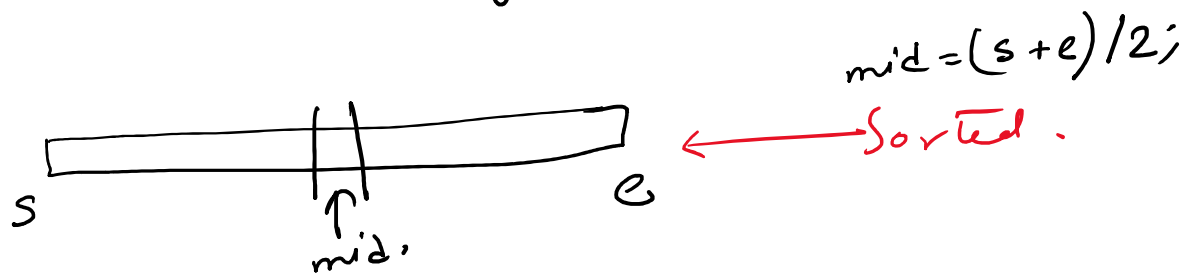   0   1   2   3   4.   return 3;

$$TC \rightarrow O(n)$$
$$SC \rightarrow O(1).$$

Search (12).
  return -1;

Binary Search —
① Sorted Array
② $TC \rightarrow O(\log n)$

$$mid = (s+e)/2;$$
→ Sorted.

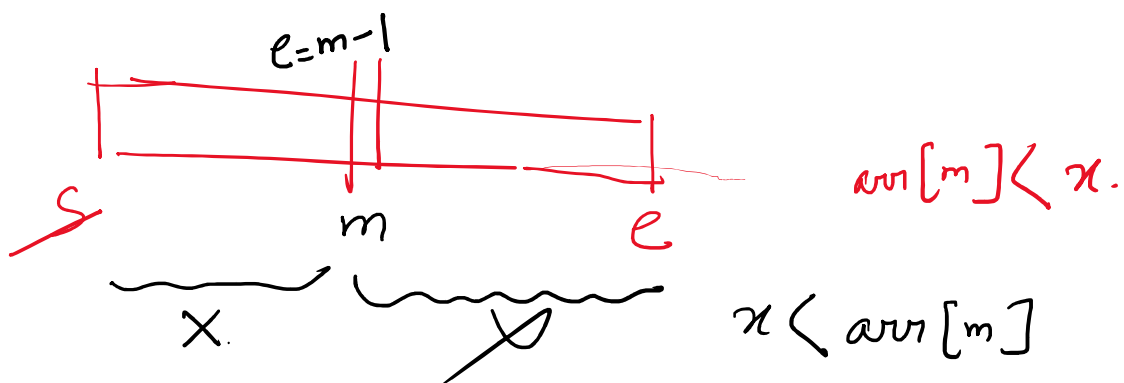S   mid,   e

Case 1 — arr[mid] == X   return mid;
Case 2   arr[mid] < X   (X lies on right, Ignore left)
Case 3   arr[mid] > X   (X lies on left, Ignore right.)

e = m-1

S   m   e

arr[m] < x.

X.

x < arr[m]

X.

$x < arr[m]$

$TC \longrightarrow O(\log n)$

$n \longrightarrow n/2 \longrightarrow n/4 \longrightarrow \cdots$