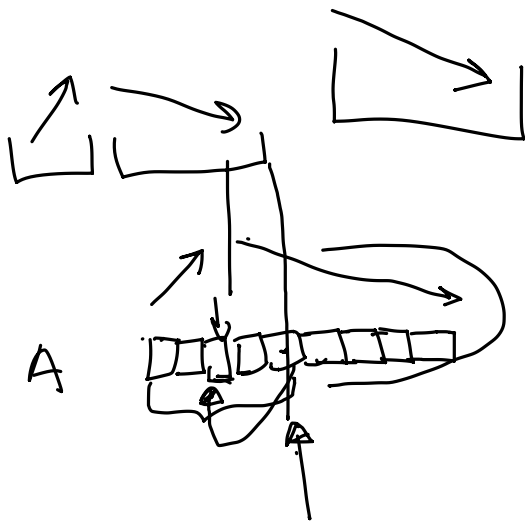


- Binary Search HW.
- Test
- Stack HW.



$O(\log n)$



middle m

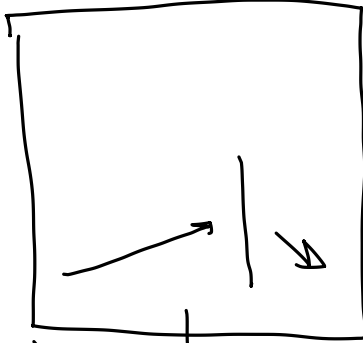
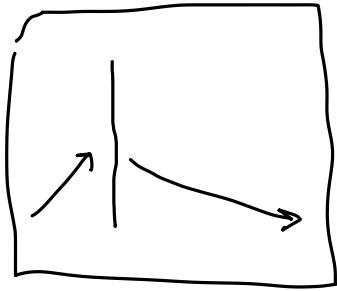
if we are in decreasing part:

go left

if we are in increasing part:

go right

$[0, 10^6] \rightarrow \text{int}$   
 $\rightarrow 4 \text{ bytes}$



12543210

1234571

121

$10^4$

123



$$\therefore \frac{0 \dots 10^5}{\dots}$$
$$\frac{0,0}{2} \quad \frac{1,1}{2} \quad \frac{2,2}{2} \quad 3,3,4, \dots$$

0, 0, 1,

2 cases: g-size

Diagram illustrating the merge step of Merge Sort. Two sorted arrays are merged into a result array. The first array contains [0, 1, 2, 3] and the second array contains [4, 5, 6, 7]. The result array is [0, 0, 1, 2, 2, 3, 3, 7, 7]. An arrow points to the element 4 in the second array, indicating it is being compared with the current element in the first array (3). The result array shows the merged output, with the element 4 having been placed at index 4.

$$\sigma|_3 = \sigma|_4 : g \circ \text{left}$$

or  
 $a[4] = a[5] : \text{go right}$

