

# Binary Search



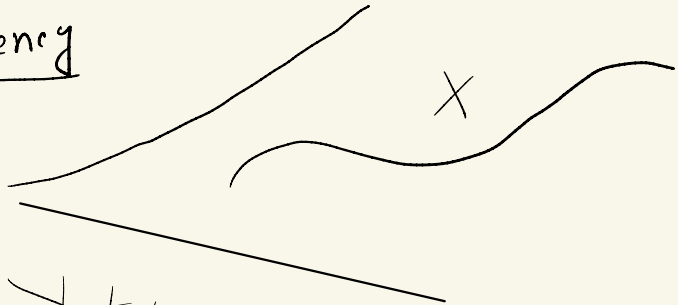
[2, 3, 3, 4, 7, 25, 35, 48]

$\Rightarrow k$   $\rightarrow$   $\text{sqrt}$

$\leftarrow 0 \rightarrow$

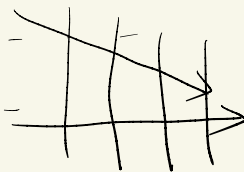
Their monotonic tendency

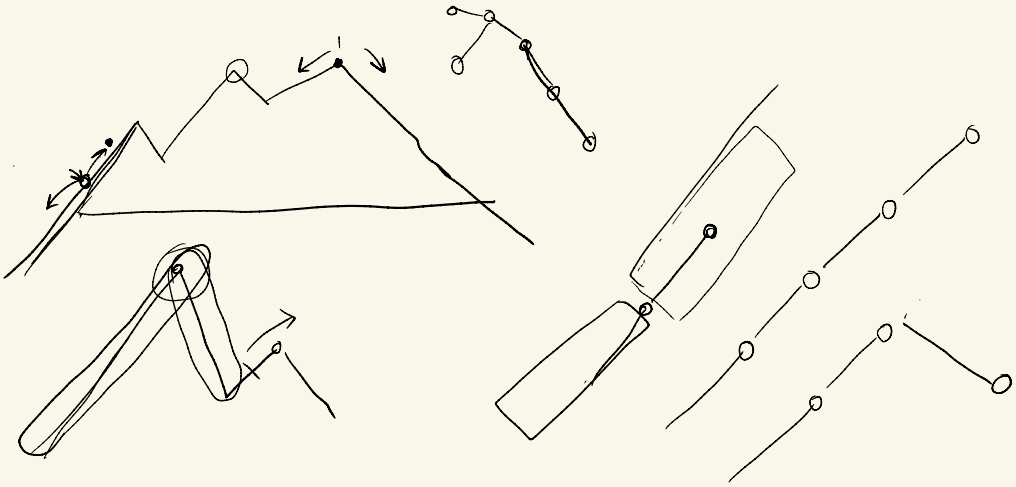
$a_i \leq a_{i+1}$



$\downarrow$   
 $\text{sq}$

$\text{sq}^2$





1	2	3	4	5	6
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1	2	3	4
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Kth element of this array (after merging)

1 1 2 2 3 3 4 4 5 6

$O(1)$ ,  $O(n \log n)$

1	2	3	4	5	6
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↑      n

1	2	3	4
---	---	---	---

↑      m

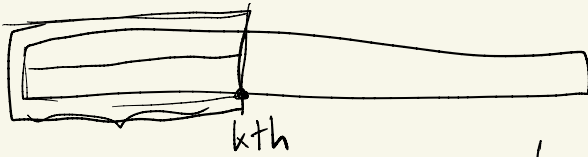
$O(n)$

1	1	-	-	-	-	-	-	-	-
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n + m

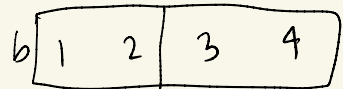
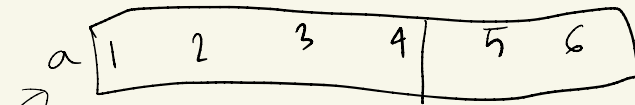
$O(\log(m+n))$

kth element

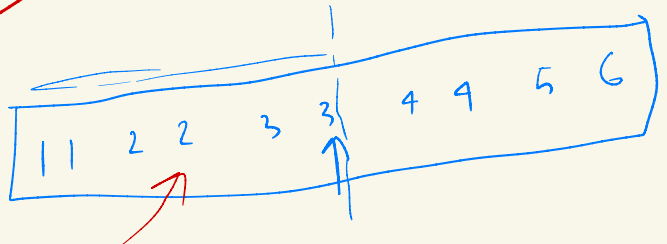
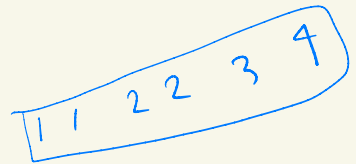
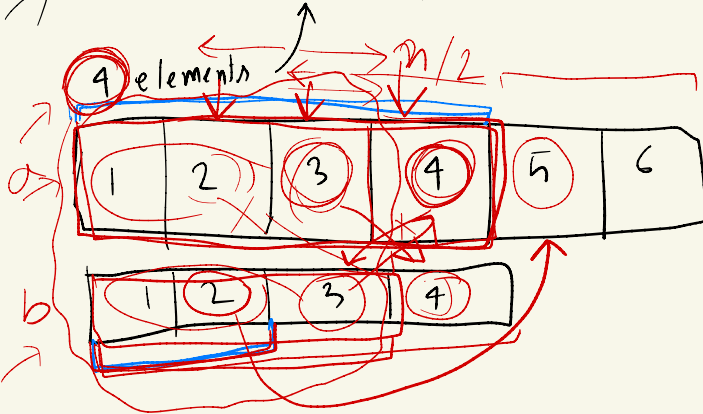


$P$  elements are coming from our first array  
 $k - P$  elements that will come from 2nd array

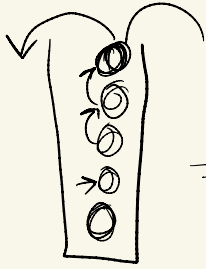
let  $k = 6$



2 elements



# Stack:



stack < >  
↔

$\Rightarrow \underline{((()())())} \Rightarrow \text{valid parentheses}$

$(a+(b)+(c))+(d+(e)) \Rightarrow$

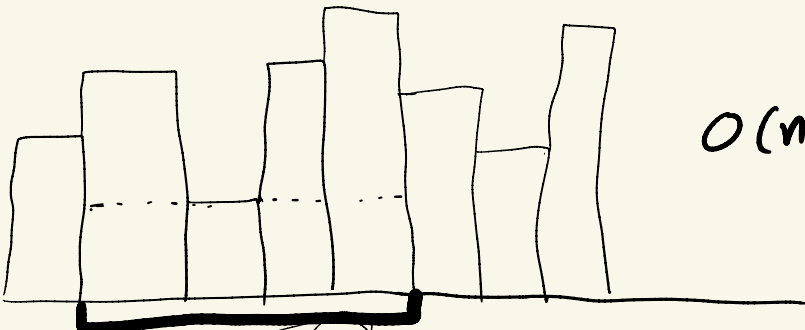
) ( ( ( )

$\underline{((()())())} \underline{((()())())} ( )$   
↑ ↑ ↑ ↑ ↑ ↑

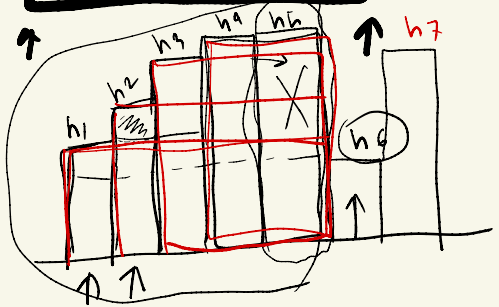
count += 1

$[ \{ \} ( ) [ \{ \} ]$

[  
  
(



$O(n^2)$



cnt = 3

- $h_5 \times 1$
- $h_4 \times 2$
- $h_3 \times 3$
- $h_2 \times 4$
- $h_1 \times 5$

