

215 kth Largest Element in array

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Sorted order Array

Solve it without sorting?

(Approach-1)

[3, 2, 1, 5, 6, 4] , k=2 \Rightarrow 2nd largest

min-heap

[3, 2, 1, 5, 6, 4] , k=2



Heap.size() == k

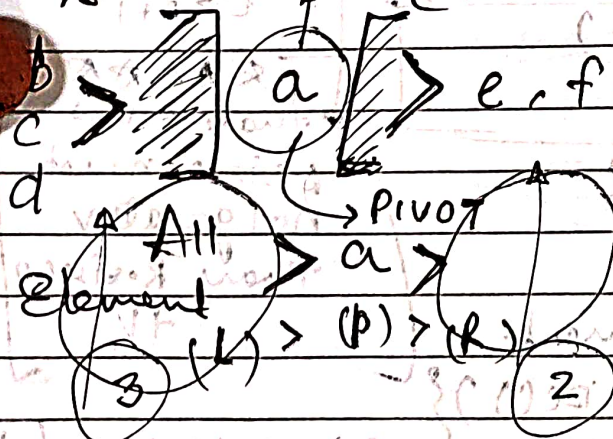
if size > k starting popping smallest element.

pq.top() = ans

[~~3~~ 2 1 5 6 4] E.T.C.
 $O(n \log n)$

Approach-2 Quick Select (Hoar's partition)

Assume 4th [3, 2, 1, 5, 6, 4] , (k=2)



[~~3~~ 2 1 5 6 4]
p \uparrow k=2 j \uparrow

if (x < p && y > p)
replace (x \rightarrow y)
(y \rightarrow x)

Arrays.sort [a, b, c, d]

if (nums[i] < p && nums[j] > p)
Swap(nums[i], nums[j])

\star always be a 4th Largest Element

if (nums[i] == p) {
i++;
}

if (nums[i] == p) {
i++;
}