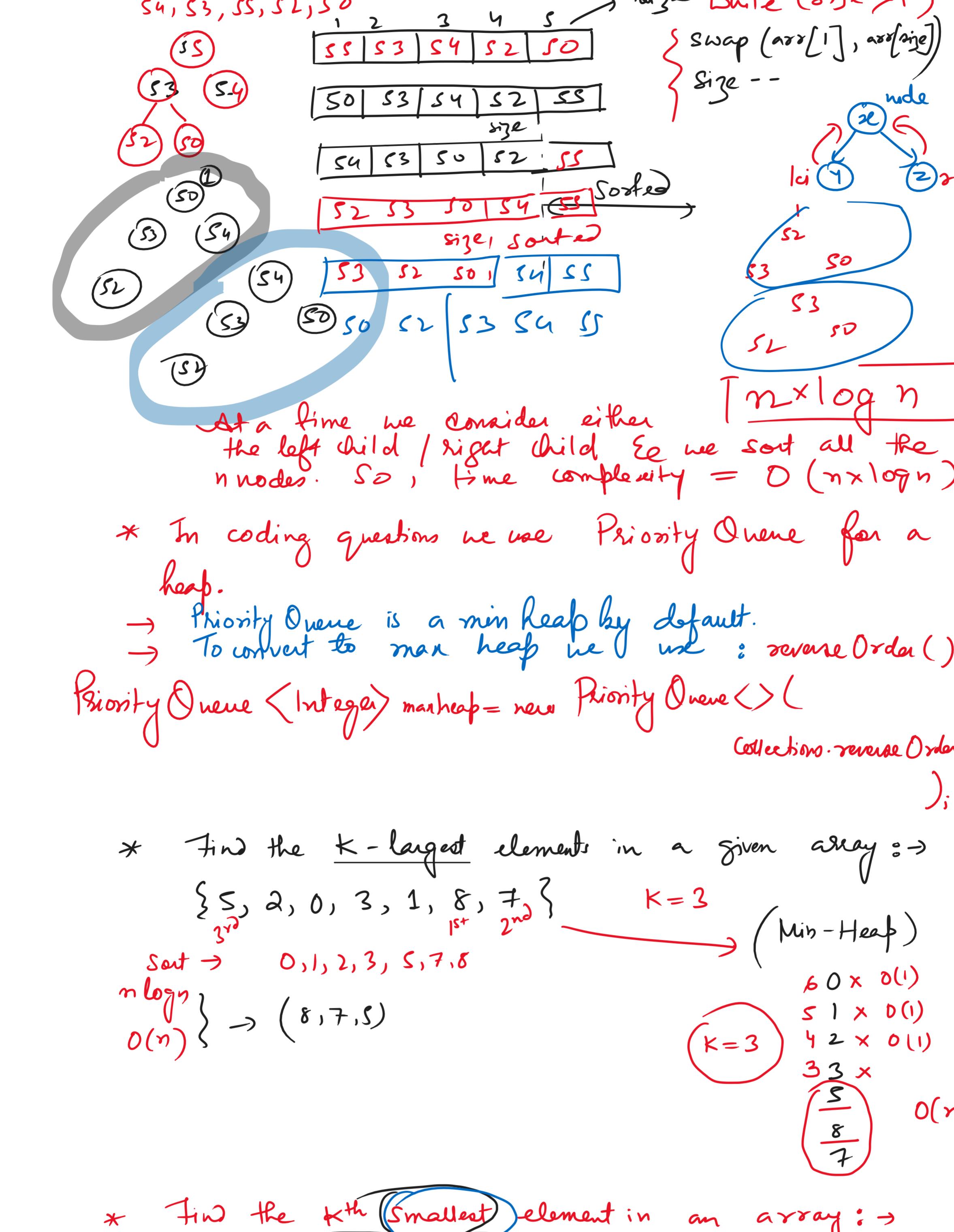


- * **Heapify** :> Converting an array into a heap data structure.

$\text{int}[] \text{arr} = \{54, 53, 55, 52, 50\}$ $\text{heapify}(\text{arr}, n, i)$



- * In coding questions we use Priority Queue for a heap.

→ Priority Queue is a min heap by default.

→ To convert to max heap we use : `reverseOrder()`

Priority Queue <Integer> maxheap = new Priority Queue<>(
 $\text{Collections.reverseOrder()}$)

- * Find the K-largest elements in a given array =>

$\{5, 2, 0, 3, 1, 8, 7\}$ $K=3$
 Sort $\rightarrow 0, 1, 2, 3, 5, 7, 8$
 $O(n \log n) \rightarrow (8, 7, 5)$

$$\frac{6}{0} \times O(1) \\ \frac{5}{1} \times O(1) \\ \frac{4}{2} \times O(1) \\ \frac{3}{3} \times O(1) \\ \frac{2}{8} \times O(n)$$

- * Find the Kth smallest element in an array =>

$\text{int}[] \text{arr} = \{7, 4, 3, 10, 20, 8\}$ $K=3$

Max Heap:

20×5
 10×4
 8×3

`mh.peek()`
`mh.poll()`

`root` \leftarrow invalid sentinel null

`a` \leftarrow wordEnd = true

`m` \leftarrow wordEnd = true

`b` \leftarrow wordEnd = true

`c` \leftarrow wordEnd = true

`d` \leftarrow wordEnd = true

`e` \leftarrow wordEnd = true

`f` \leftarrow wordEnd = true

`g` \leftarrow wordEnd = true

`h` \leftarrow wordEnd = true

`i` \leftarrow wordEnd = true

`j` \leftarrow wordEnd = true

`k` \leftarrow wordEnd = true

`l` \leftarrow wordEnd = true

`m` \leftarrow wordEnd = true

`n` \leftarrow wordEnd = true

`o` \leftarrow wordEnd = true

`p` \leftarrow wordEnd = true

`q` \leftarrow wordEnd = true

`r` \leftarrow wordEnd = true

`s` \leftarrow wordEnd = true

`t` \leftarrow wordEnd = true

`u` \leftarrow wordEnd = true

`v` \leftarrow wordEnd = true

`w` \leftarrow wordEnd = true

`x` \leftarrow wordEnd = true

`y` \leftarrow wordEnd = true

`z` \leftarrow wordEnd = true

`aa` \leftarrow wordEnd = true

`bb` \leftarrow wordEnd = true

`cc` \leftarrow wordEnd = true

`dd` \leftarrow wordEnd = true

`ee` \leftarrow wordEnd = true

`ff` \leftarrow wordEnd = true

`gg` \leftarrow wordEnd = true

`hh` \leftarrow wordEnd = true

`ii` \leftarrow wordEnd = true

`jj` \leftarrow wordEnd = true

`kk` \leftarrow wordEnd = true

`ll` \leftarrow wordEnd = true

`mm` \leftarrow wordEnd = true

`nn` \leftarrow wordEnd = true

`oo` \leftarrow wordEnd = true

`pp` \leftarrow wordEnd = true

`qq` \leftarrow wordEnd = true

`rr` \leftarrow wordEnd = true

`ss` \leftarrow wordEnd = true

`tt` \leftarrow wordEnd = true

`uu` \leftarrow wordEnd = true

`vv` \leftarrow wordEnd = true

`ww` \leftarrow wordEnd = true

`xx` \leftarrow wordEnd = true

`yy` \leftarrow wordEnd = true

`zz` \leftarrow wordEnd = true

`aa` \leftarrow wordEnd = true

`bb` \leftarrow wordEnd = true

`cc` \leftarrow wordEnd = true

`dd` \leftarrow wordEnd = true

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`xx` \leftarrow wordEnd = true

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`bb` \leftarrow wordEnd = true

`cc` \leftarrow wordEnd = true

`dd` \leftarrow wordEnd = true

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`pp` \leftarrow wordEnd = true