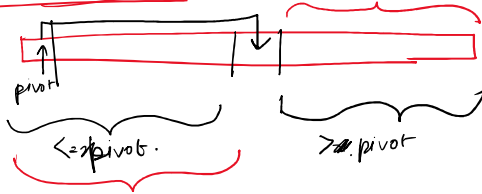


Quick Sort TC & SC.



Best Case / Avg

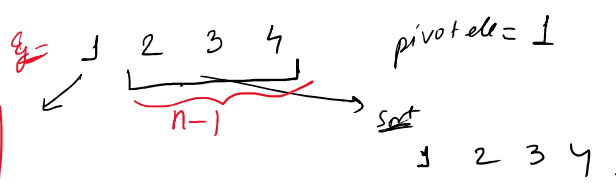
- Pivot \rightarrow original position \rightarrow middle

$n/2$ $n/2$ p or $p+1$

$$T(n) = 2T(n/2) + n$$

$$= O(n \log n)$$

Worst case

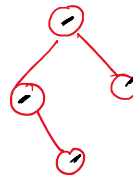


$$T(n) = T(n-1) + n$$

$$TC = O(n^2)$$

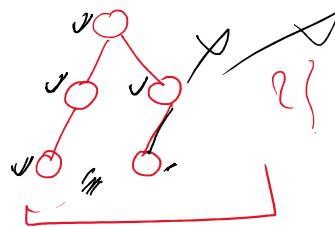
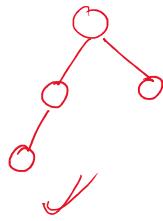
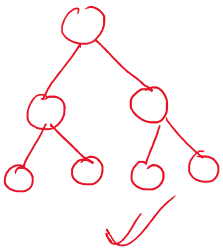
Binary Tree - Kuch nodes hoga.

Nodes ka 0/1/2 children



Almost Complete Binary Tree -

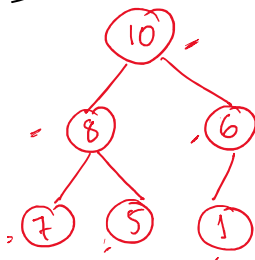
Nodes insert karo from left direction



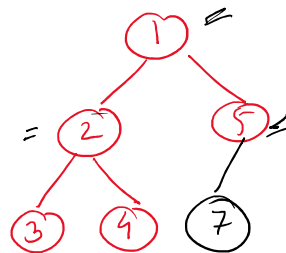
Heap - ① ACBT.

- Max heap (Parent's value $>$ child's value)
- Min heap (Parent's value $<$ child's value).

Max heap eg



Is this Min heap ??

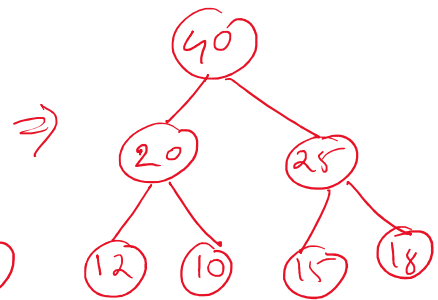
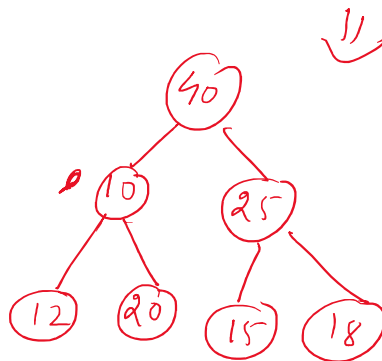
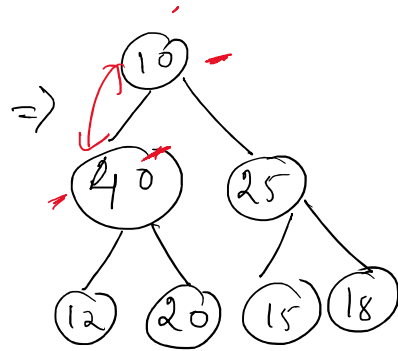
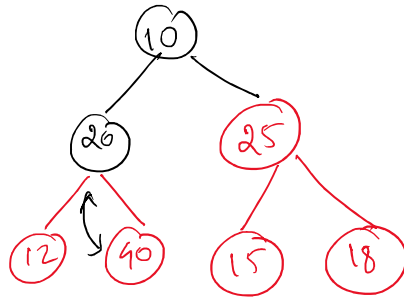
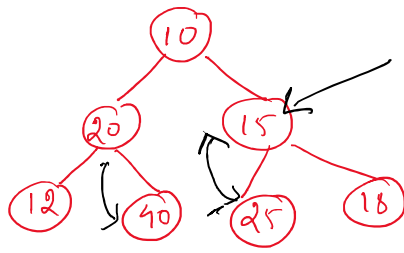


HEAPIFY - Convert array to Max/Min Heap.

HEAPIFY - ~~Ab~~ Convert array to Max/Min Heap.

10 20 15 12 40 25 18.

- ① Convert into ACBT
- ② LAST non-leaf node.



- ① Root value ko Aay se likho
- ② Root \rightarrow value = Last node value.
- ③ Delete last node.