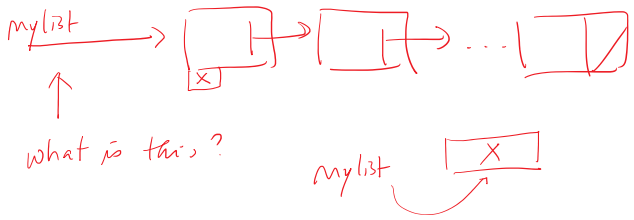
linked lists (singly linked list)



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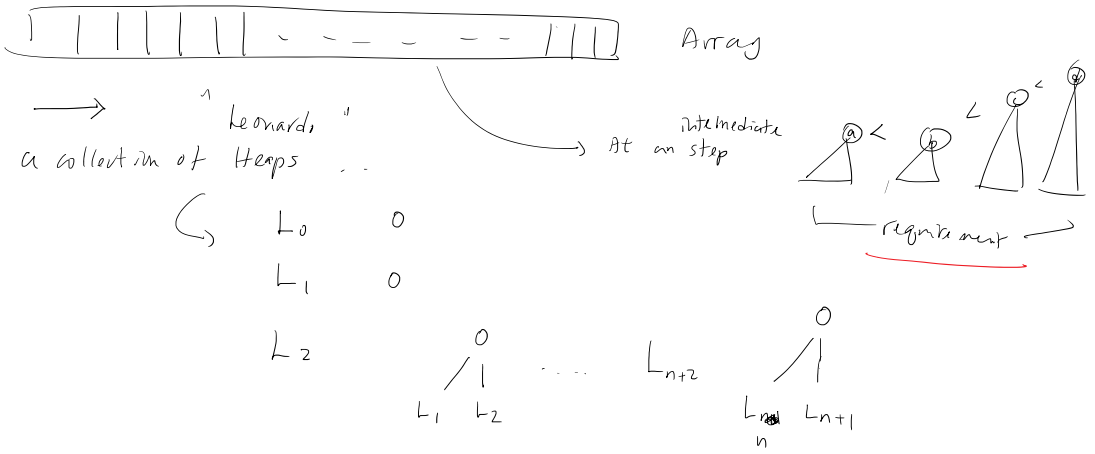
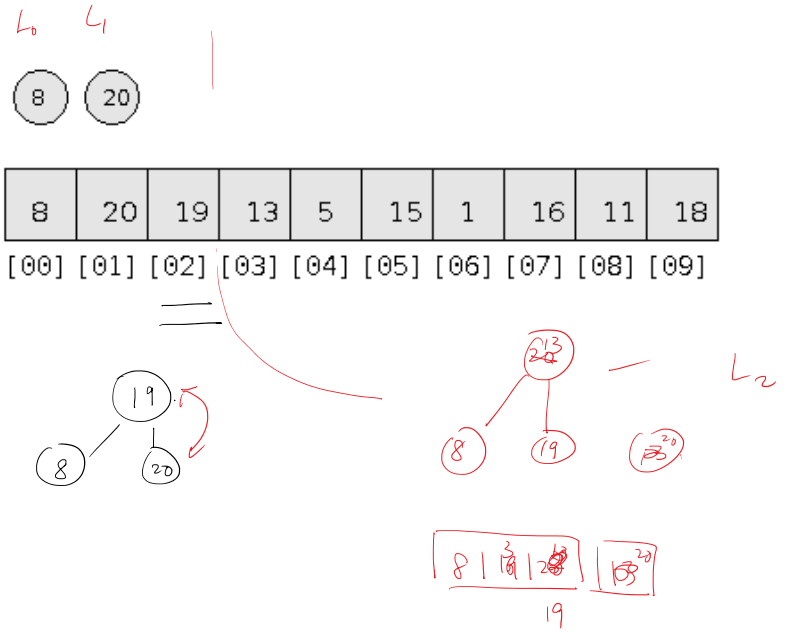
(2) Leonardo Heap (for Smooth Sort) "Dijkstra"

Sorting method (Comparison based)

worst case $\Theta(n \lg n)$

best case $O(n)$

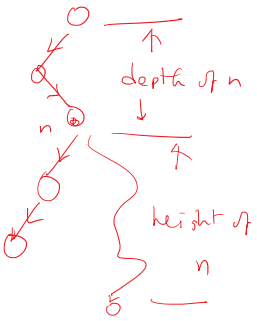




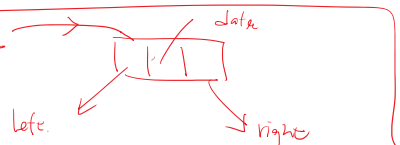
Trees (free trees : graphs)

Trees (free trees : graphs)

- rooted tree
- ordered tree



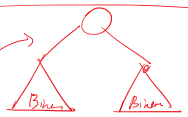
Binary tree T

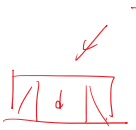


① Base case

empty tree is a binary tree

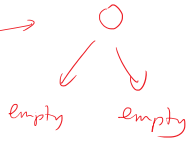
② General Case

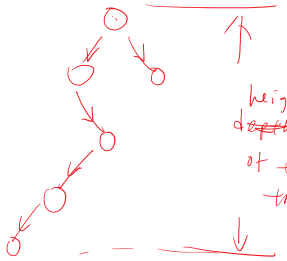




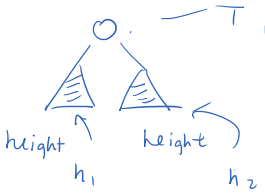
Tree T_1

height (T_1) = 0



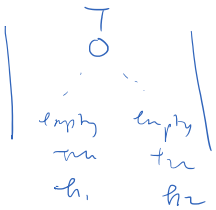


Write a function to compute



height (T) = 1 + max { h_1, h_2 }

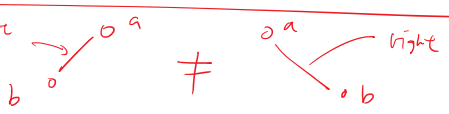
What is the height of the empty tree ??



height (T) = 1 + max { h_1, h_2 }

= 0 (−1)

binary tree



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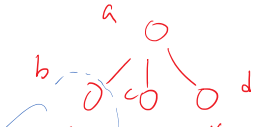
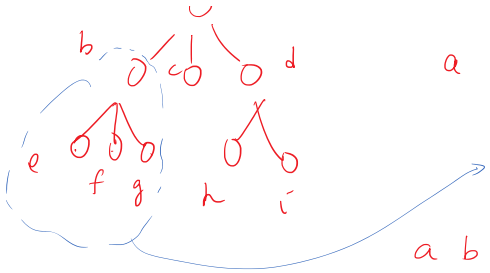
Traversal

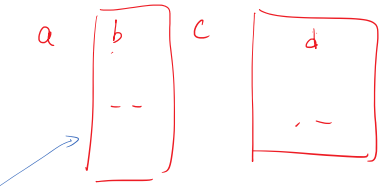
preorder

n T_1 ... T_n



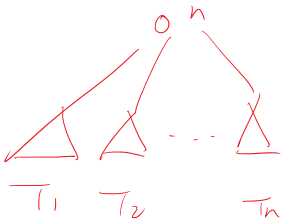
a [b c [d





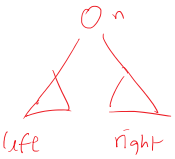
a b [e f g] c d [h, i]

post-order

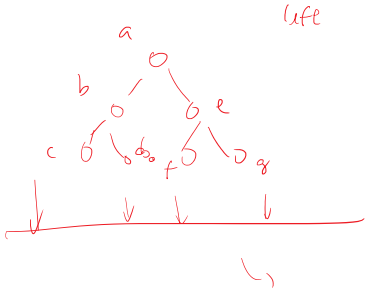


$T_1 \dots T_n$ o n

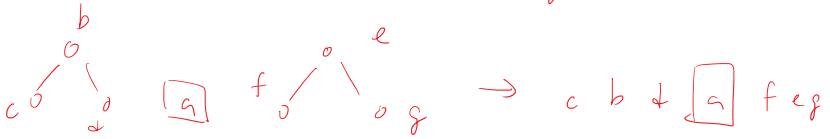
In-order



left o n right



c b d [a] f e g



→ c b d [a] f e g