Wednesday

Contest 9 - 10:30

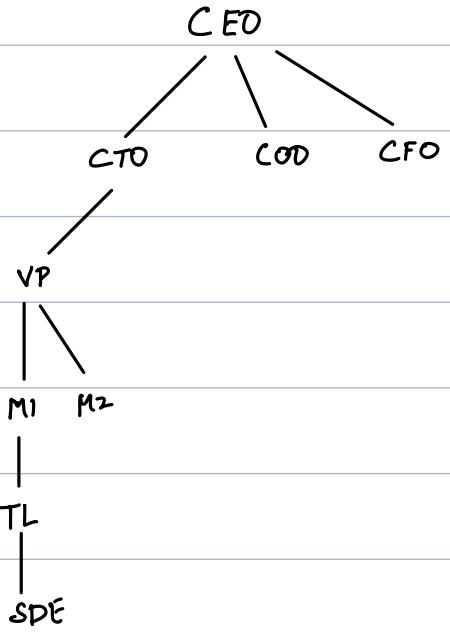
[strings to LL]

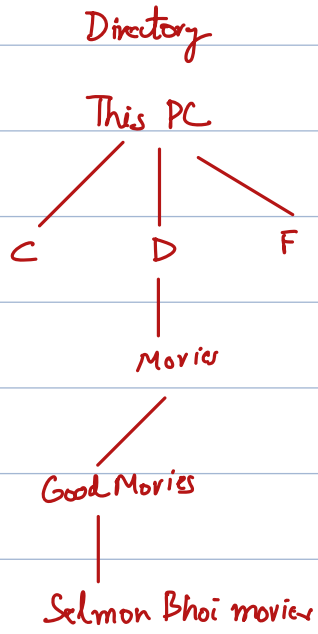
Trees

Strings , Arrays , LL

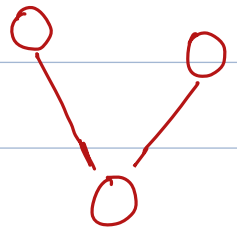
Hierarchical DS

Trees , Graphs





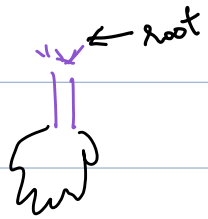
SQL {Relation DB}



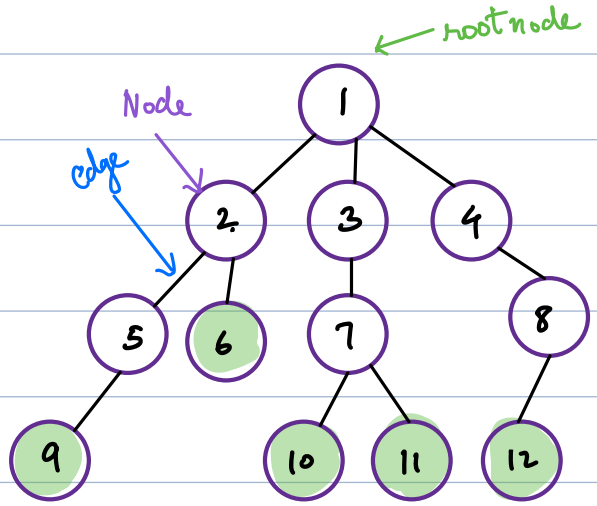
Not a tree

Every node of a tree has only one parent

Naming conventions



1 is ancestor to everyone



4 related to 1

1 ⇄ 4 (parent / child)

8 is a grand child of 1

12 " " descendent of 1

8 " " " " "

4 " " " " "

1 is an ancestor of 7

" " " " " 10

10 is not a descendant of 4, 2

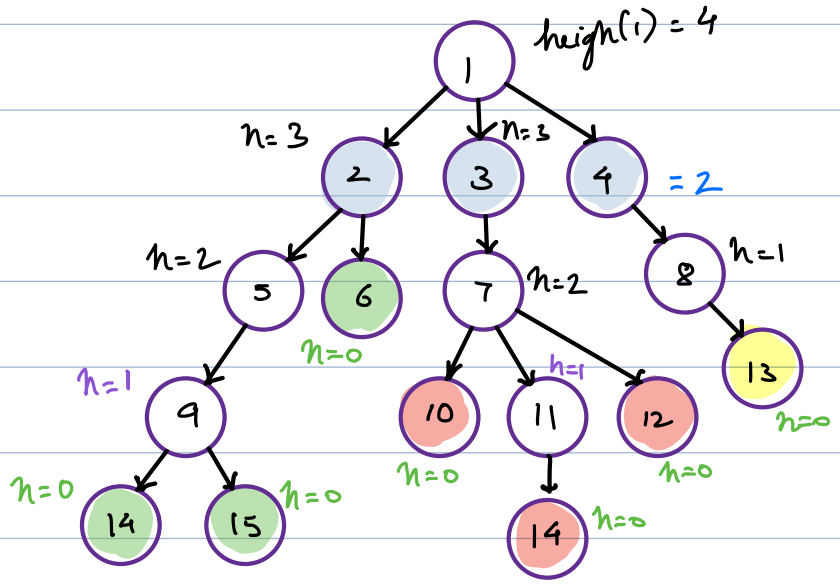
Why? Not in same branch

Leaf nodes: Nodes with 0 children

Height

Height of a node is max path length between a node to its descendant leaf node

Path len: No. of edges b/w nodes



height (node) = max (height of its children) + 1

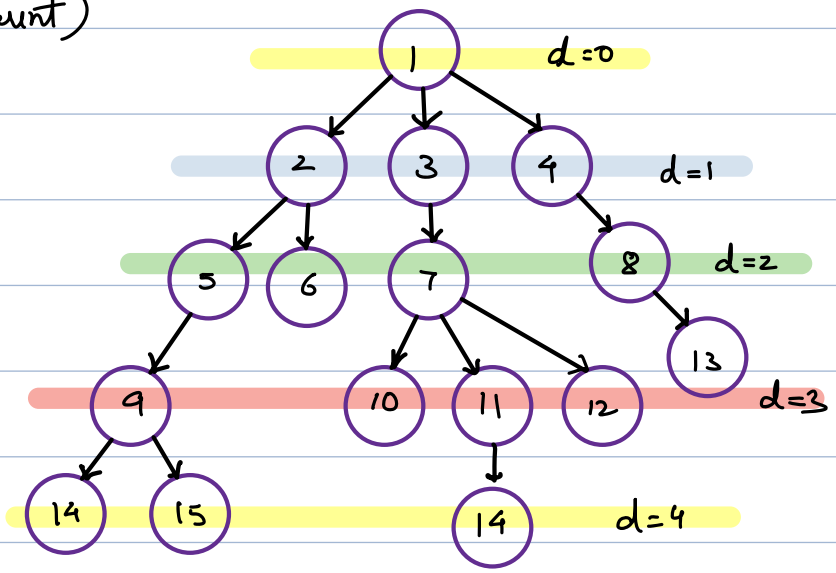
Depth

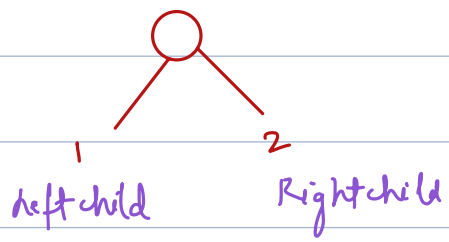
Distance of any node to root node

depth (node) = 1 + depth (parent)

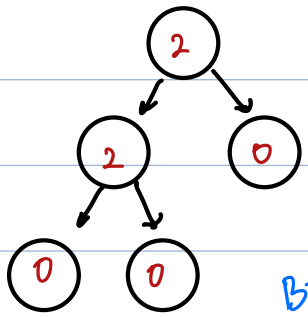
d(root) = 0

by definition

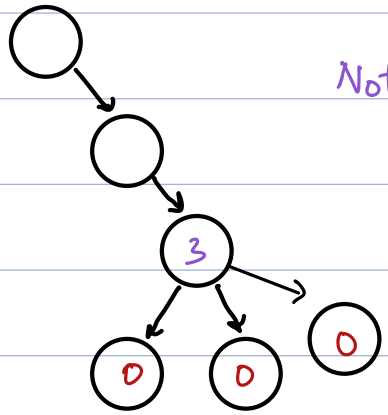



1
2
leftchild
Rightchild

Binary Tree : A tree having all nodes <= 2 children



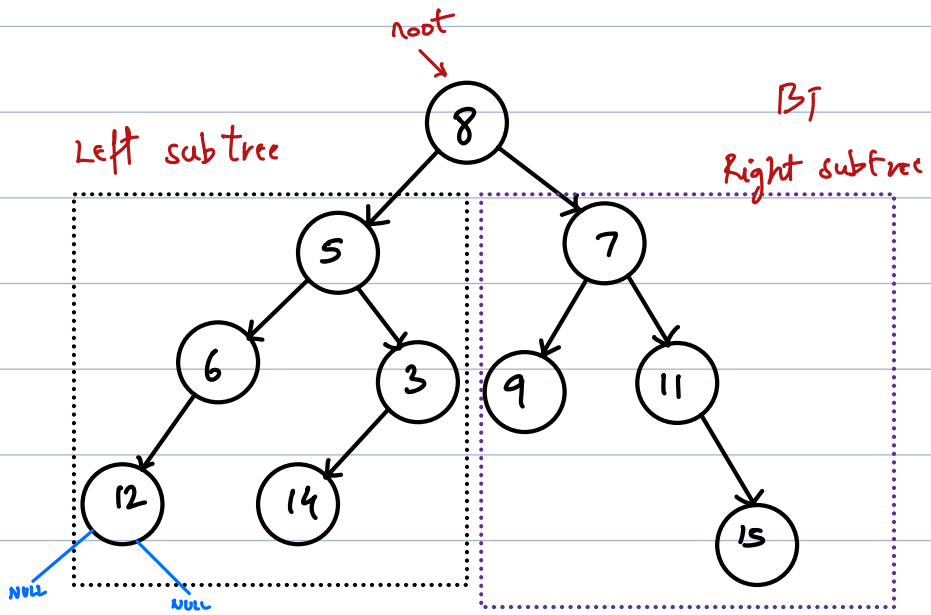
BT



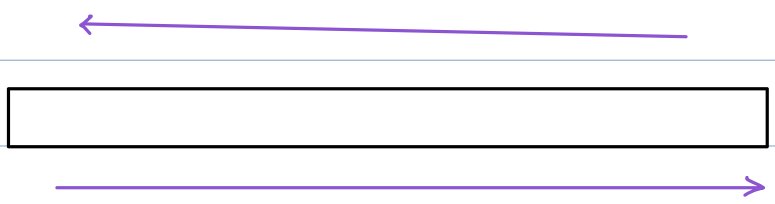
Not a BT

BT

NULL smallest Binary Tree



Recursive DS



Traversals in a BT

1) Preorder : Root → Left subtree → Right subtree
2) Inorder : LeftSubtree → Root → Right subtree
3) Postorder : Left Subtree → Right Subtree → Root
4) Level order → Advance [Queue]

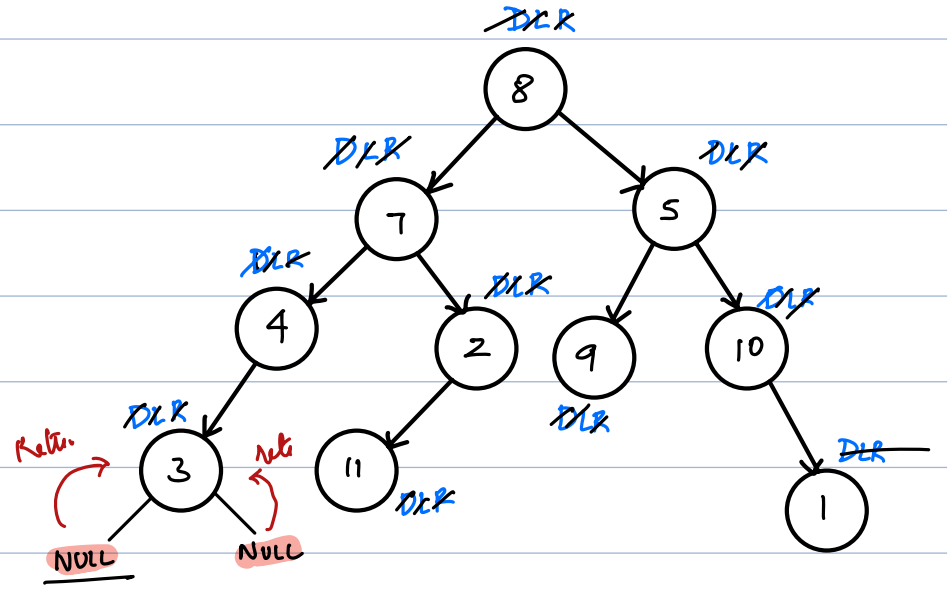
TREE TRAVERSALS

Print root

preorder : D L R

inorder : L D R

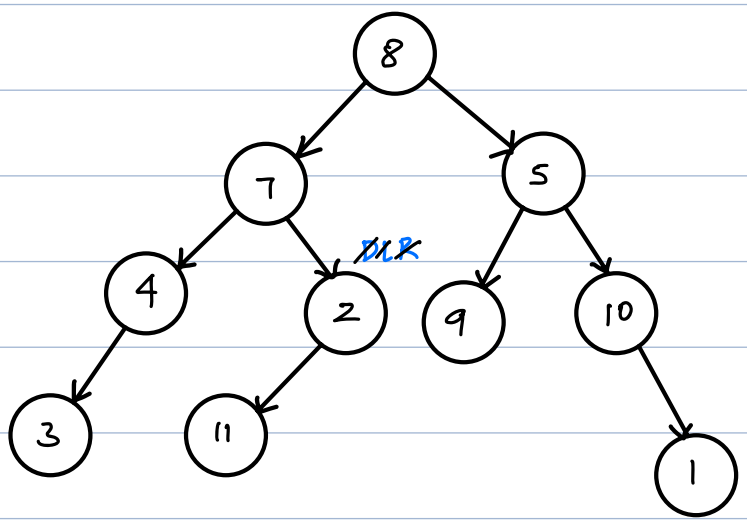
postorder : L R D



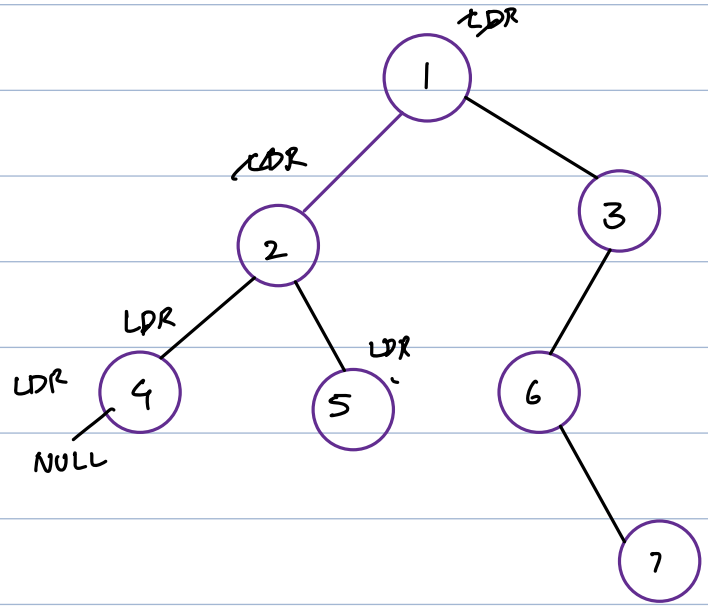
Preorder

Preorder

Print : 8 7 4 3 2 11 5 9 10 1



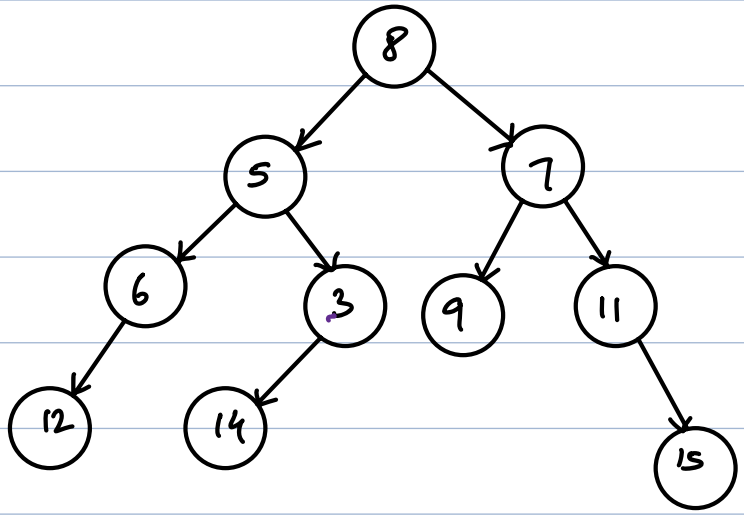
Inorder LDR



Inorder

4 2 5 1 6 7 3

Calculate size of a tree:



Find sum of all nodes

Find height of a tree