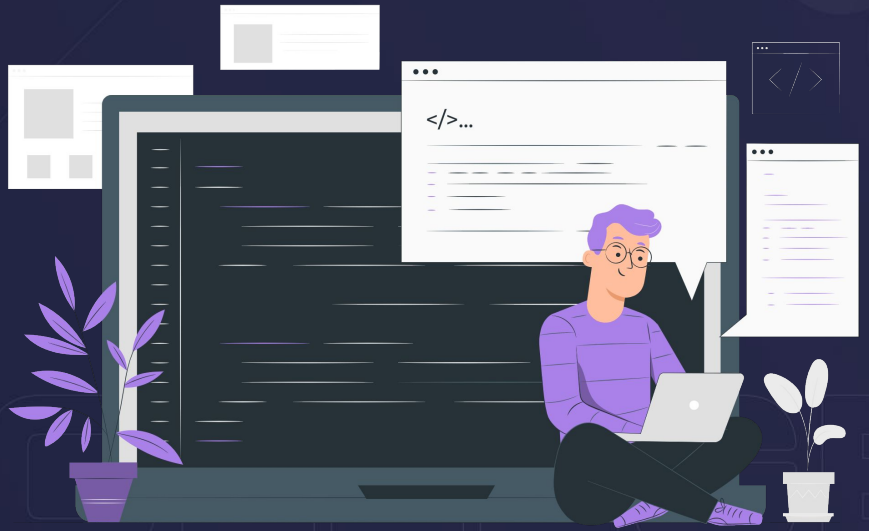
PW SKILLS

Lecture – 54

Binary Trees

[Interview Ques]



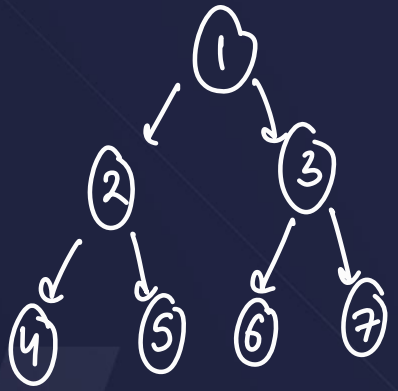
Recap

- Types of Trees, Terminology, (Size, Sum, Max, height) problems
- Some Leetcode questions
- Traversals, DFS and BFS

1. Preorder Traversal (Iterative)

Root Left Right

↳ stack



1 2 4 5 3 6 7


```
while (st.size()>0){
    temp = st.top();
    st.pop();
    ans.push_back(temp->val);
    if(temp->right) st.push(
    if (temp->left) ——
}
```

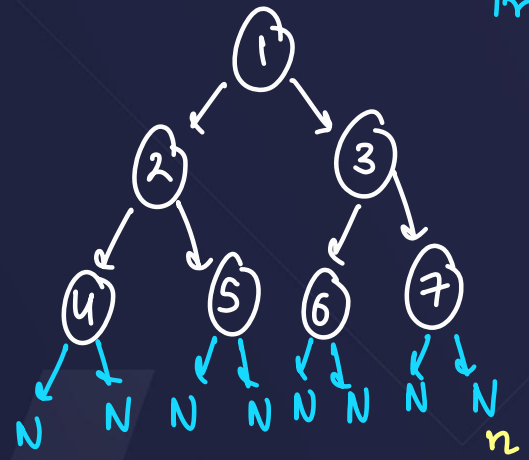
Stack < TreeNode*> st;

queue	stack
FIFO	LIFO/FILO

2. Inorder Traversal (Iterative)

Left Root Right

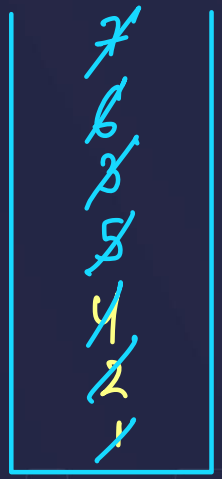
↳ 1 stack



Fn: 4 2 5 1 6 3 7

4 2 5 1 6 3 7

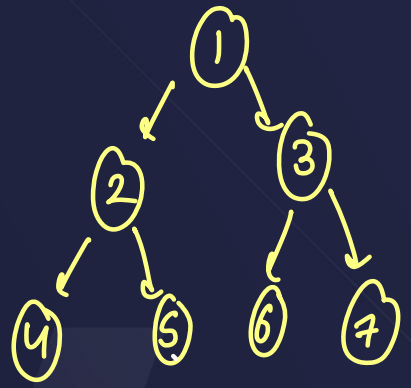
TreeNode* node = root

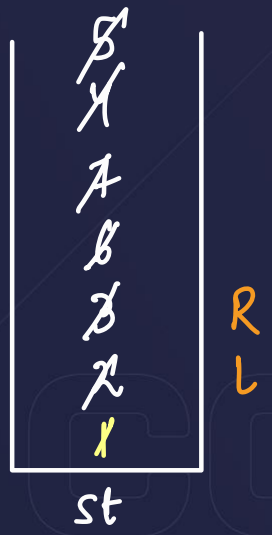



```
if(node!=NULL)
    st.push(node)
    node = node->left
}
else{
    empty st cond
    temp = st.top()
    st.pop()
    visit
    node = temp->right
}
```

3. Postorder Traversal (Iterative) Left Right Root

↳ 1 stack



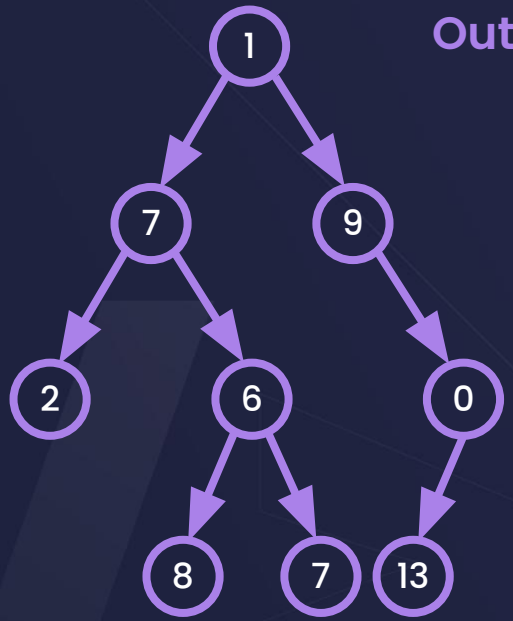


ans = {1, 3, 7, 6, 2, 5, 4}

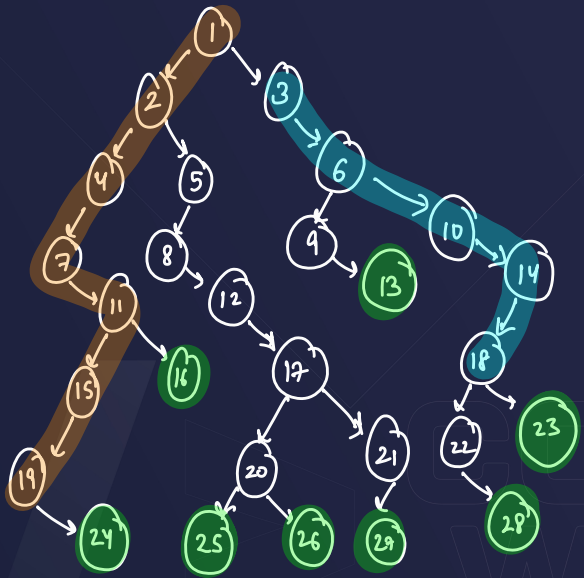
rev ↳ {4, 5, 2, 6, 7, 3, 1}

Boundary Traversal

Given a binary tree, print boundary nodes of the binary tree Anti-Clockwise starting from the root.



Output : 1 7 2 8 7 13 0 9



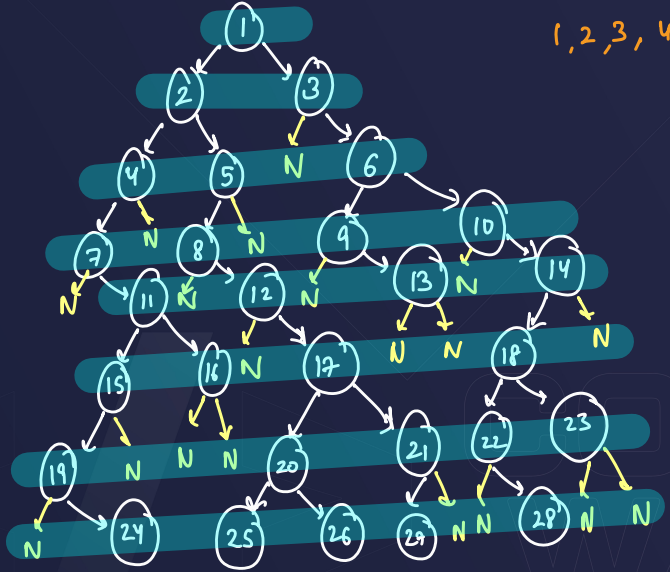
1) Left Boundary (excluding ln)

2) Leaf nodes (l → r)

3) Right boundary (excluding ln) (reverse order)

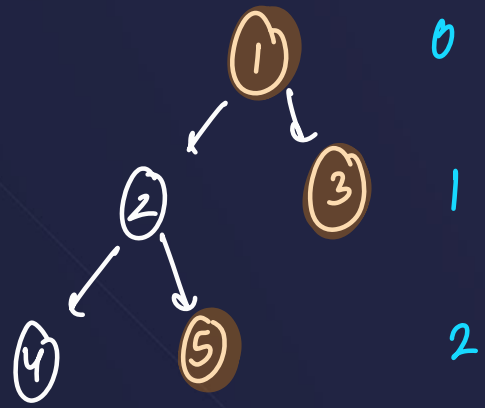
BB: 24 16 25 26 27 13 28 23

Construct using BFS : array



1, 2, 3, 4, 5, N, 6, 7, N, 8, N, 9, 10,

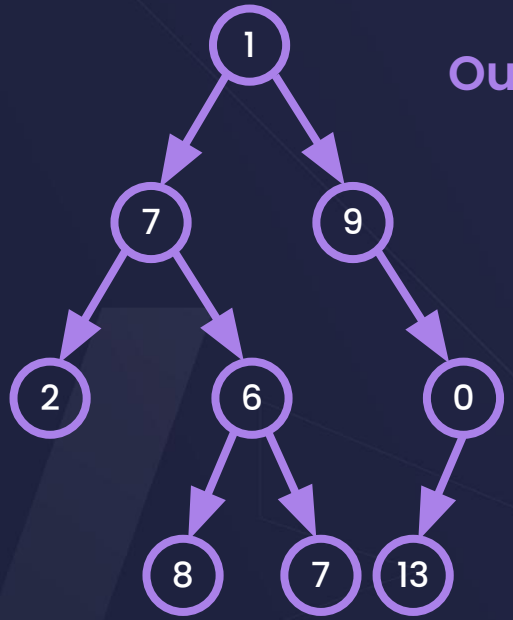
Ques: Binary Tree Right Side View [LeetCode 199]



ans = { 0, 0, 0 }
0 1 2

Top View of Binary Tree : Important

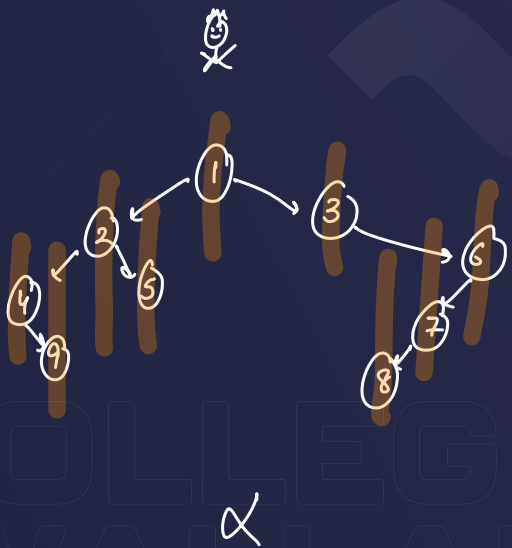
Given a Binary Tree, print the Top view of it.
The top view of a binary tree refers to the set of nodes that are visible when the tree is viewed from the top side.



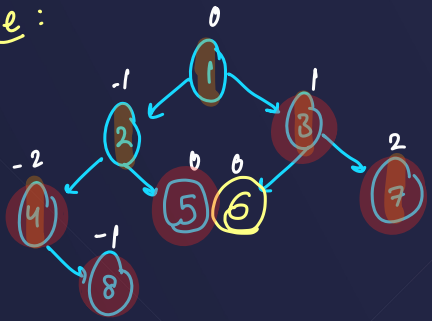
Output : 2 7 1 9 0

View, Top & Bottom

ans = {4, 2, 1, 3, 6}



Example :



Top View : 4 2 1 3 7

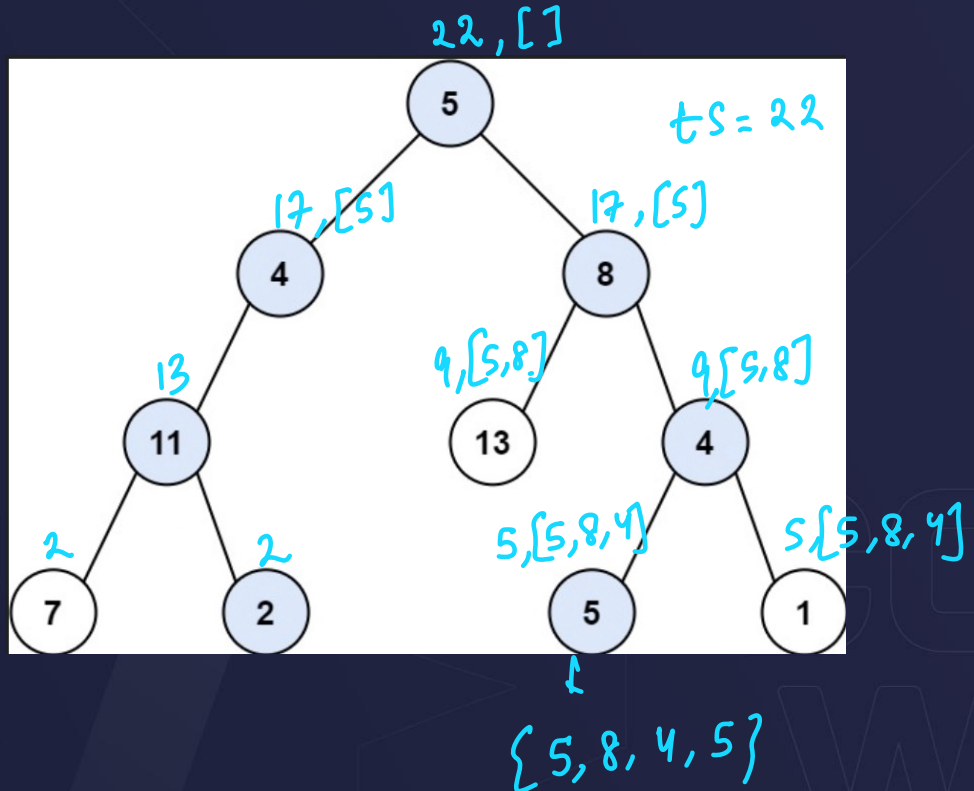
Bottom View : 4 8 5 3 7

↓

overlapping hogi

Ques: Path Sum II

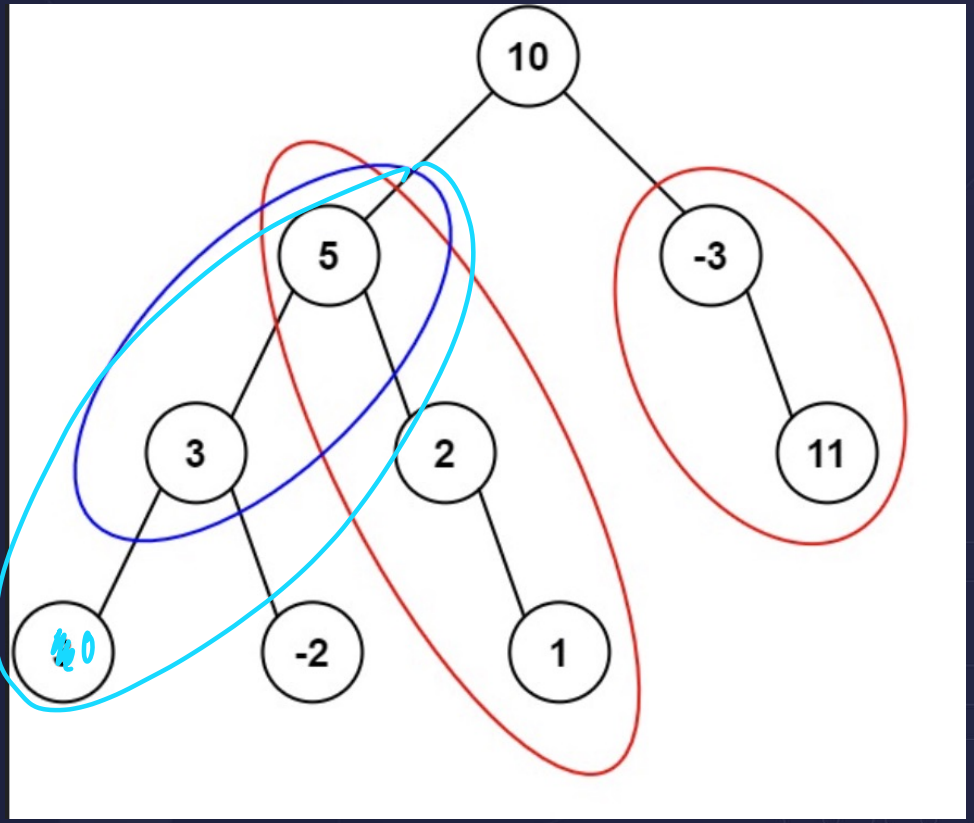
[LeetCode 113]



Ques: Path Sum III

[LeetCode 437]

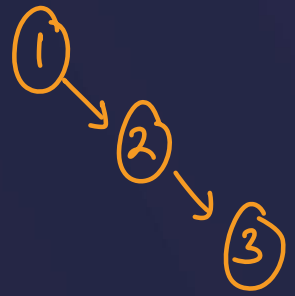
target = 8



Ques: Construct Binary Tree from Preorder & Inorder Traversal [LeetCode 105]

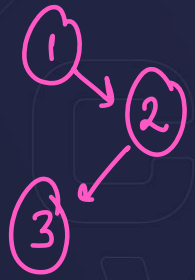
pre : 1 2 3

pre : 1 2 3



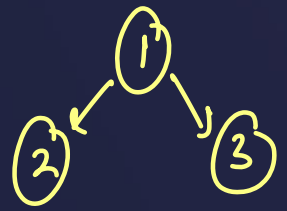
pre : 1, 2, 3

pre : 1 2 3



pre : 1 2 3

Ques: Construct Binary Tree from Preorder & Inorder Traversal [LeetCode 105]



In : 2 1 3

In : 2 1 3

In : 2 1 3

Ques: Construct Binary Tree from Preorder & Inorder Traversal [LeetCode 105]

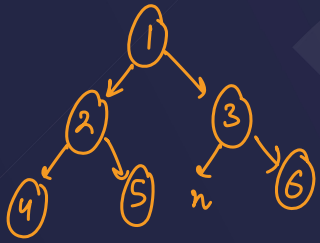
Ques: Construct Binary Tree from Preorder & Inorder Traversal [LeetCode 105]

Homework : Leetcode 106, 889


pl
pl+1
pl+lc
pl+lc+1
ph
Pre :
1 2 4 5 3 6
In :
4 2 5 1 3 6
inlo
i-1
i
i+1
inhi


pl
ph
pre:
2 4 5
In:
4 2 5
pre: 4
In : 4
pre: 5
in: 5


pl
ph
pre:
3 6
In :
3 6
il
ih
i


1
2
3
4
5
n
6

Next Lecture

- Binary Search Trees

SKILLS

THANK YOU