

Traversal + View

30 March 2024 02:08 PM

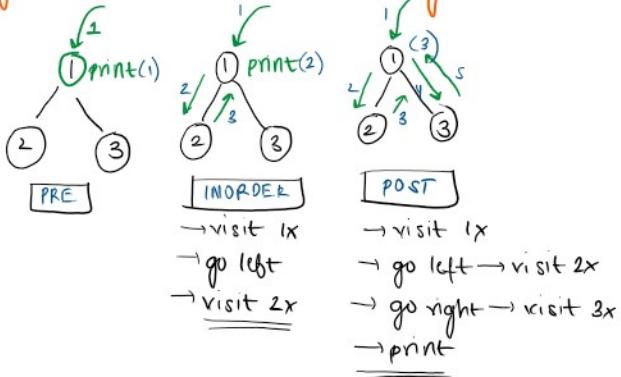
| Tree Traversal Docs: <https://takeuforward.org/binary-tree/binary-tree-traversal-inorder-preorder-postorder/>

TC $\rightarrow O(N)$
SC $\rightarrow O(3N)$

► Preorder Inorder Postorder Traversals in One Traversal

→ How many times you visit a node before printing it?

- ① Preorder $1 \times$
Print $\rightarrow L \rightarrow R$
- ② INORDER $2 \times$
 $L \rightarrow$ Print $\rightarrow R$
- ③ POST ORDER $3 \times$
 $L \rightarrow R \rightarrow$ Print



SOLN

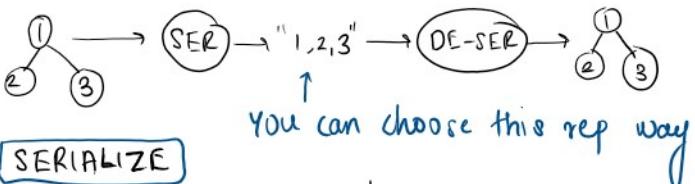
$Q = [(Root, 1)]$

while (Q):

```
    cur = Q.pop()
    if cur[1] == 1:        elif cur[1] == 2:        elif cur[1] == 3:
        add preorder      add inorder       add postorder
        Q.append((curr, 2)) Q.append((curr, 3))   ↓
        Q.append((left, 1)) Q.append((right, 1))  ① you dont add
        ↓                   ↓                   ② L → R → print X
    / means you have pre 2 → INORDER
    → (print) → left ✓  → (L) → (print) → right ✓
    subtree
```

► SERIALIZED + DESERIALIZED

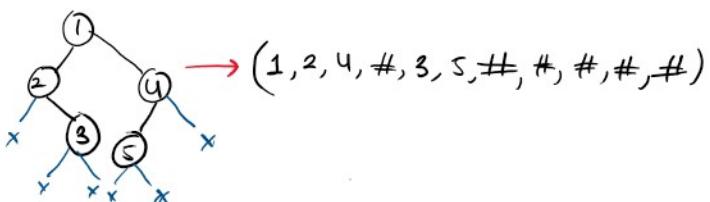
→ Given a tree convert it into any str rep (can use any delim or way)
→ Convert it back to tree



SERIALIZE

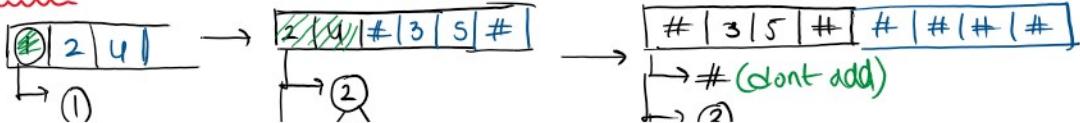
problem → handle null/empty nodes

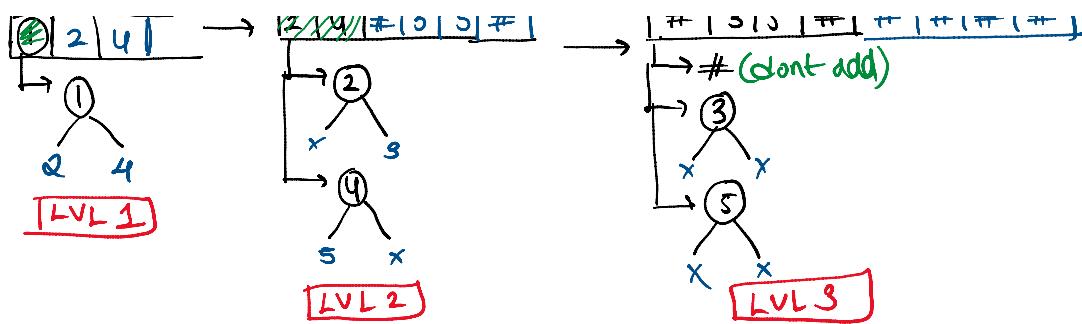
SOLUTION: Replace **NULL → #** in str + Level order traversal



→ handle commas added at end of str
→ return only val in case only root node

DRY RUN

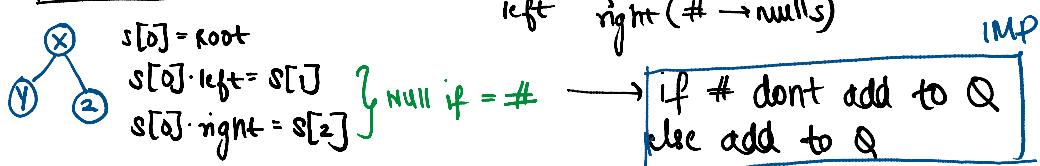




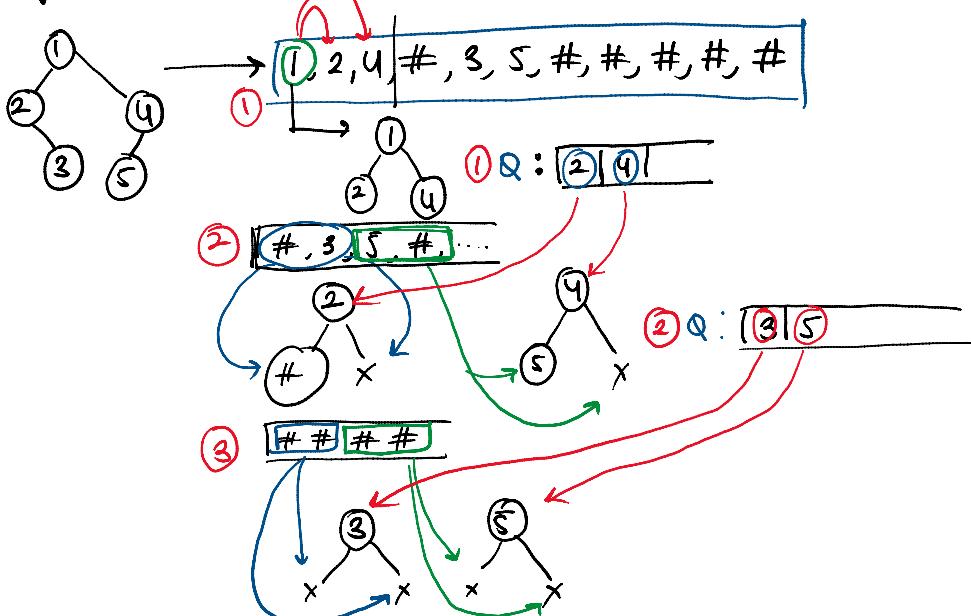
DESERIALIZE

* In SER we made sure we added **2 nodes + node**

* **x | y | z | ...**

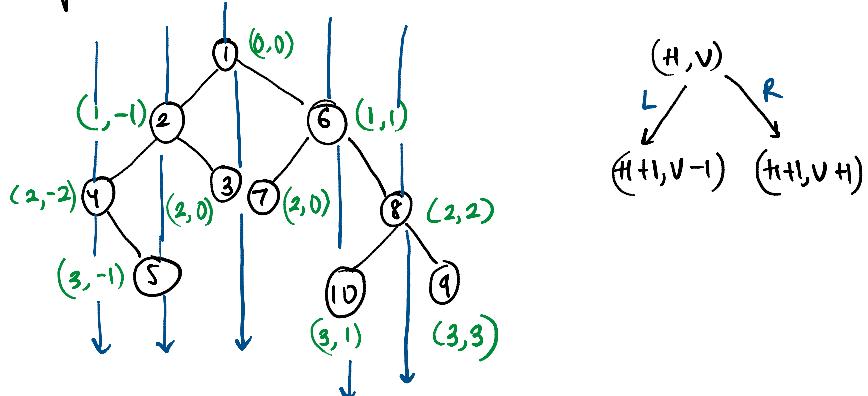


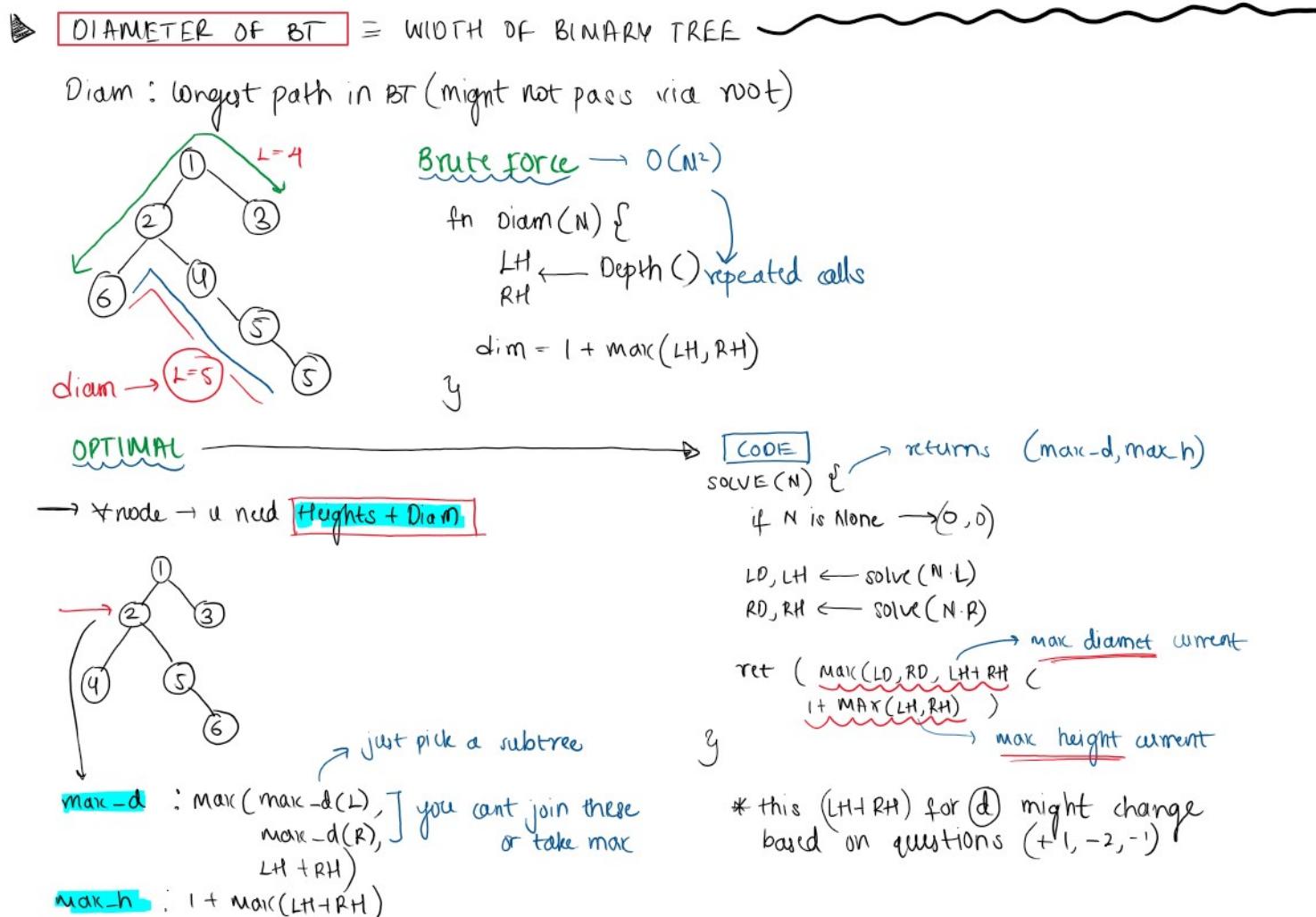
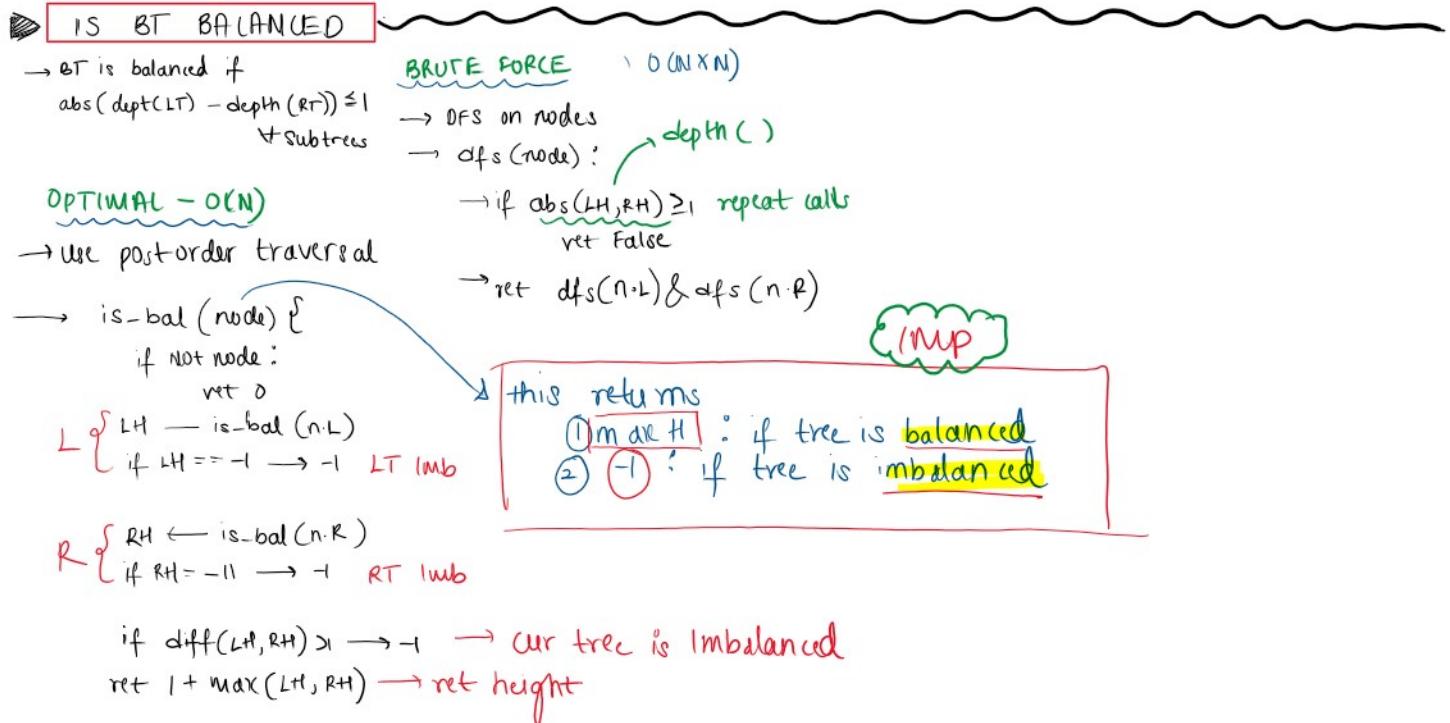
try run



VERTICAL TRAVERSALS

→ Assign vertical and horizontal levels to tree nodes





Path - Sum - Count based

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MAX PATH SUM IN BT