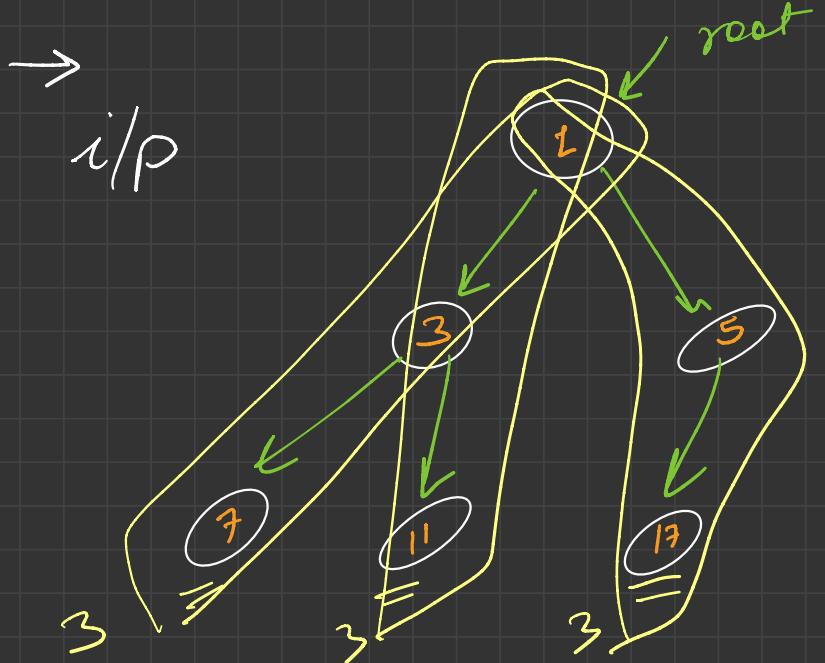


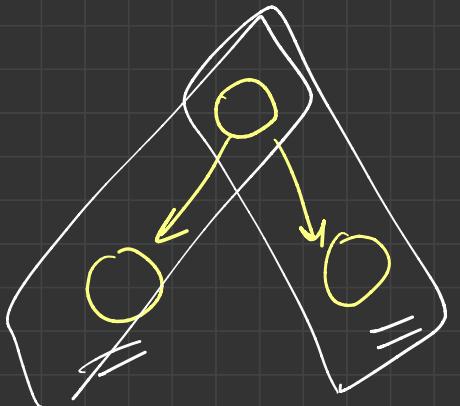

Trees



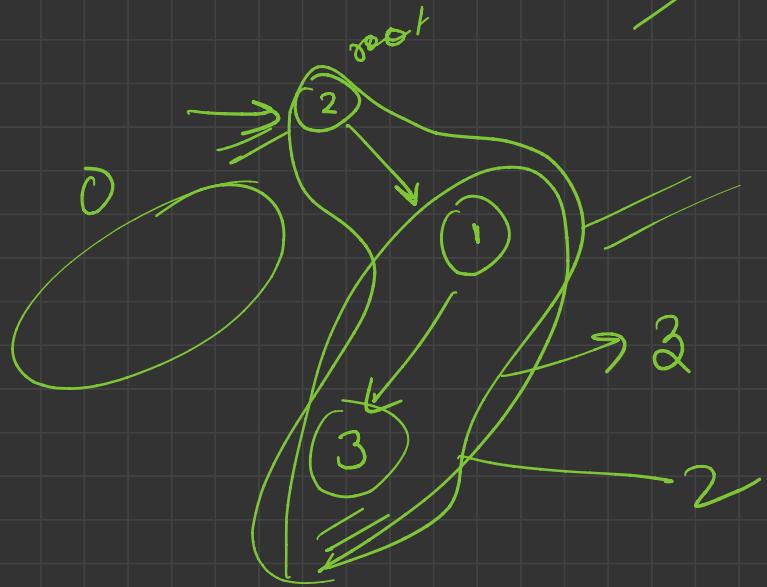
height = ?

longest path b/w
root node & a left
node

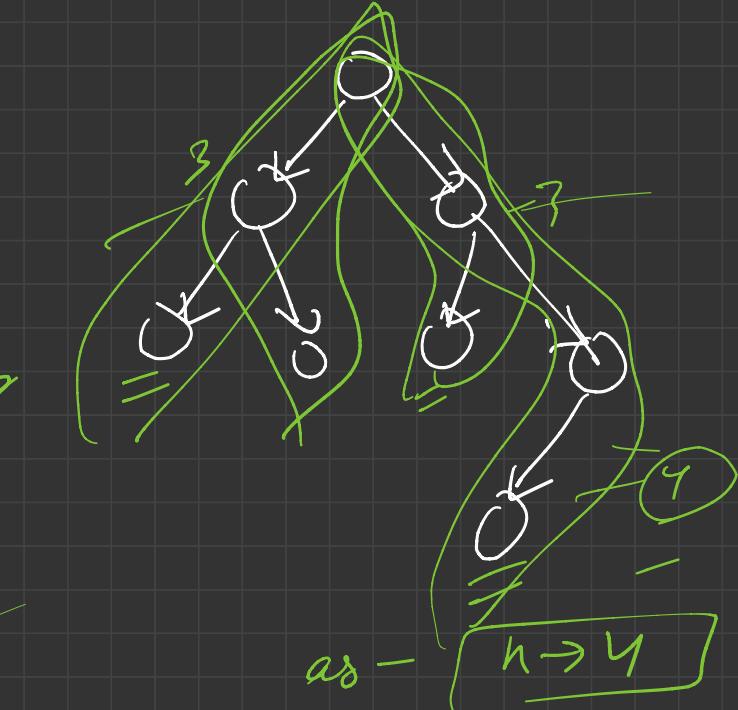
no of nodes → height



(2)

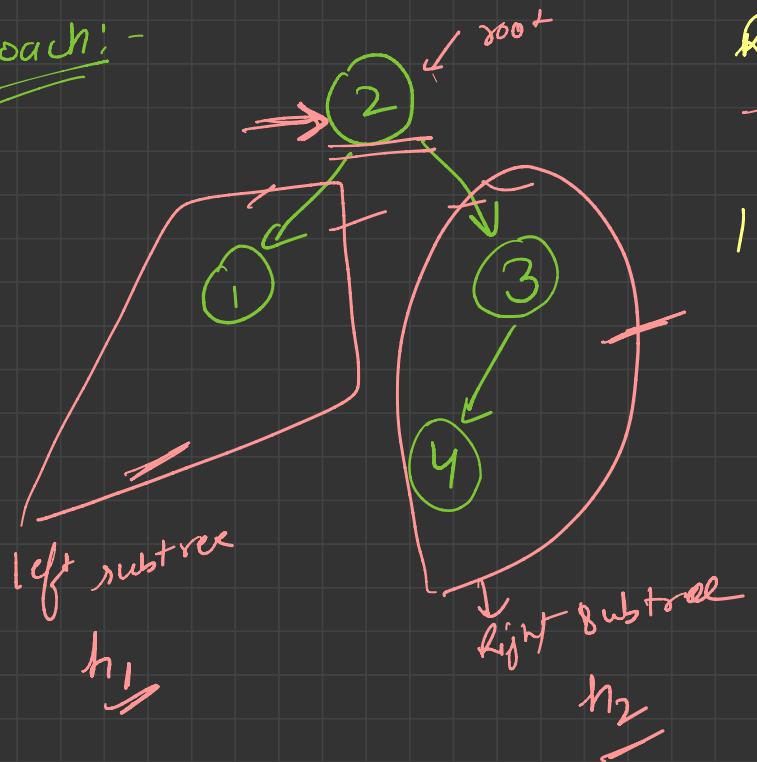


asort



(2, 0) 2 2 + 1 2 (3)

approach:-



Recursion:-

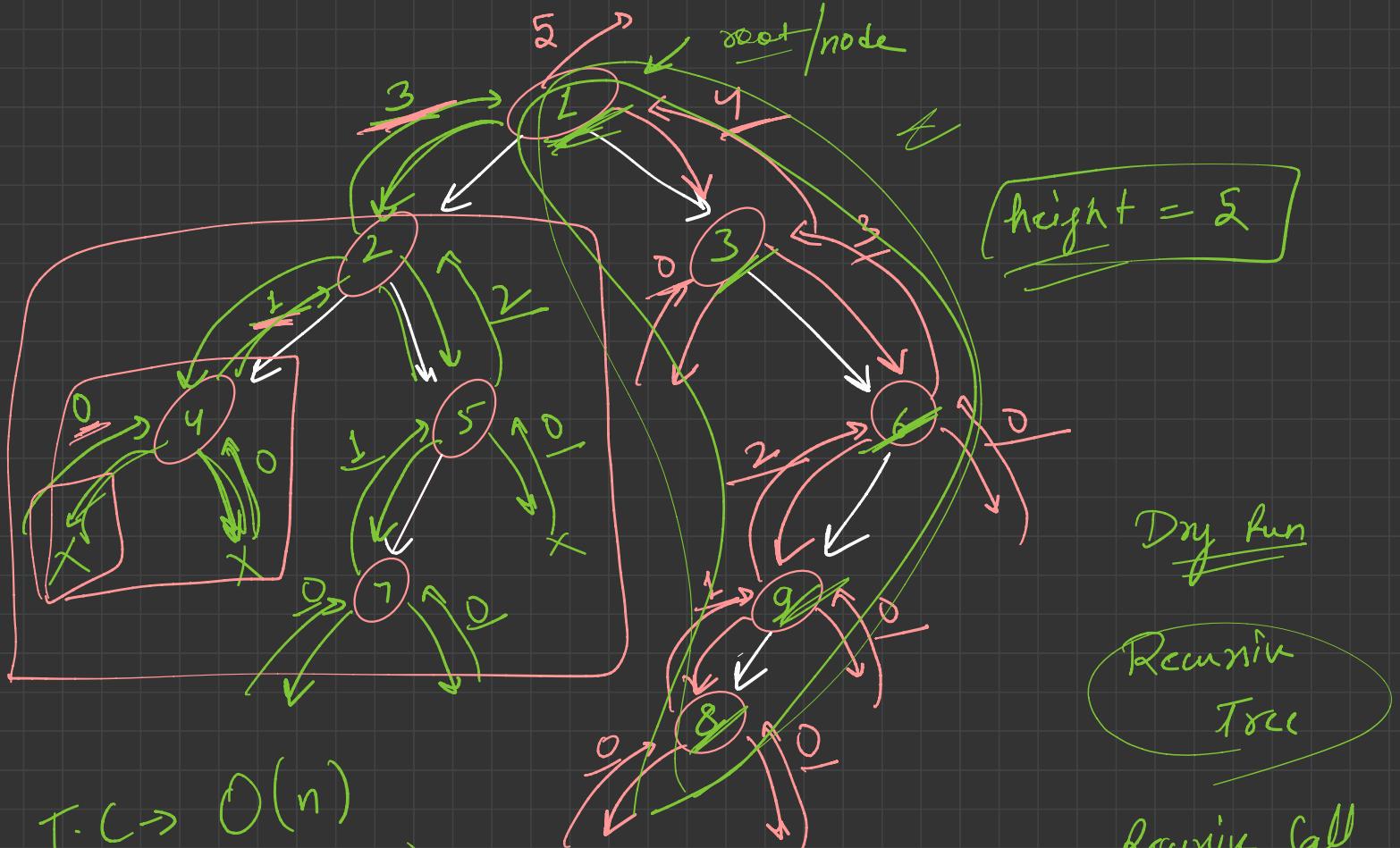
~~Recursion:-~~ Baaki Recursion
sub problem
lga

1 case solve

Kardo

$$\max(h_1, h_2) + 1$$

height



$T.C \rightarrow O(n)$
 $S.C \rightarrow O(\text{height}) \rightarrow O(n)$

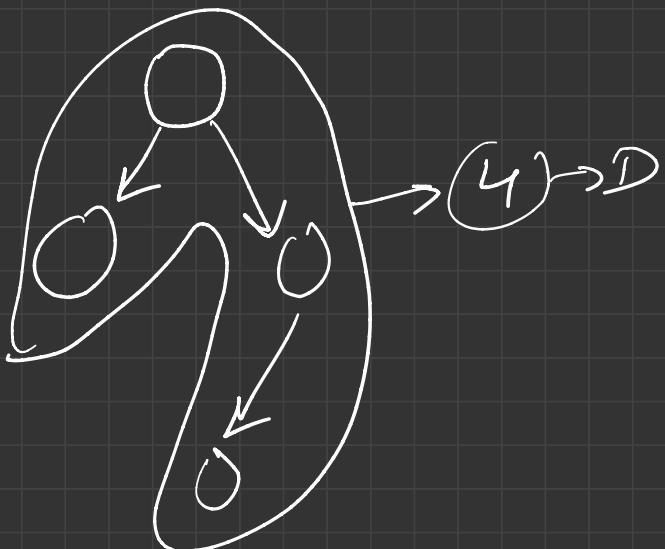
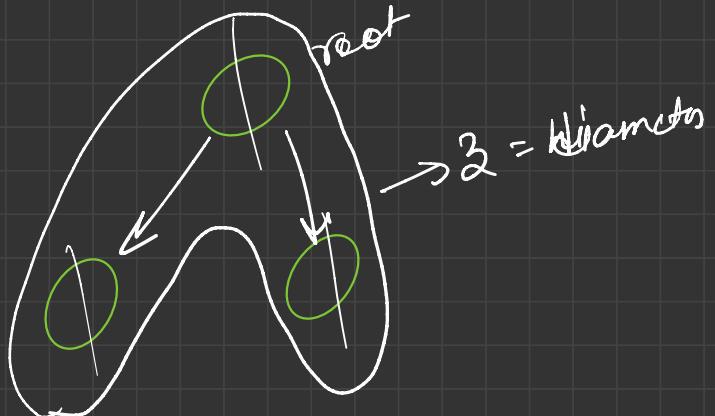
Recursive call stack

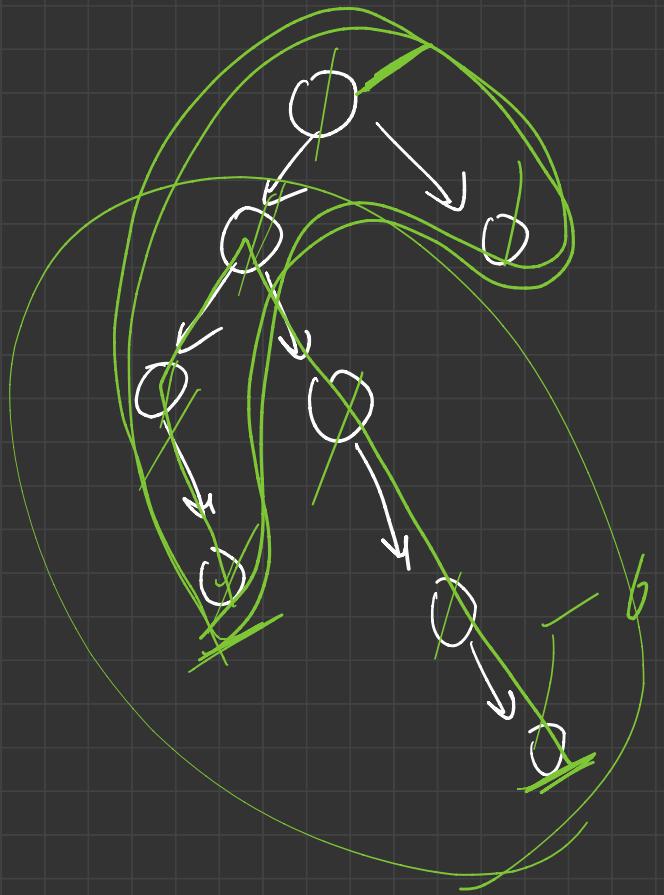
Recursive trace

\Rightarrow Diameter of Tree \rightarrow Longest path b/w
 any 2 nodes

width \uparrow

no. of nodes

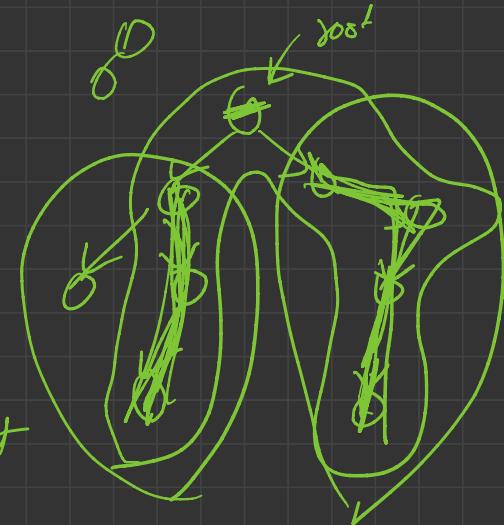
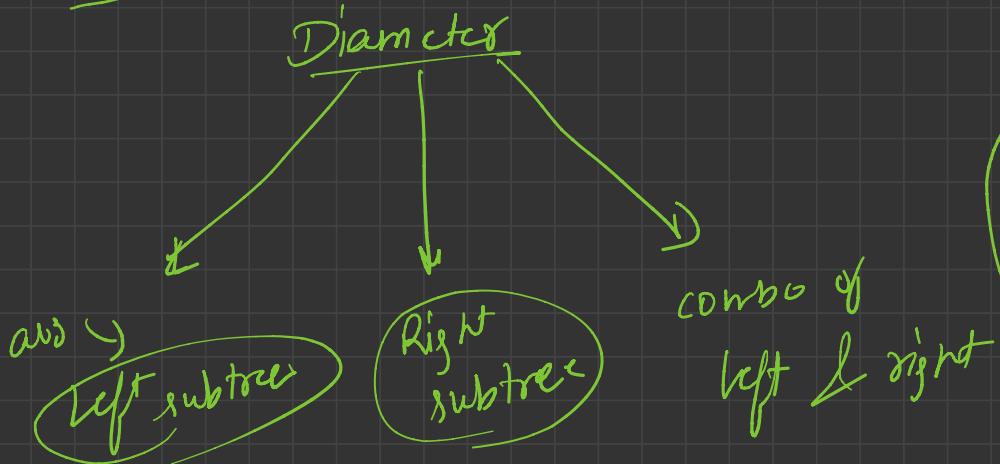




5

longest path b/w
any 2 crd nodes
Leaf / Root nodes

→ approach -



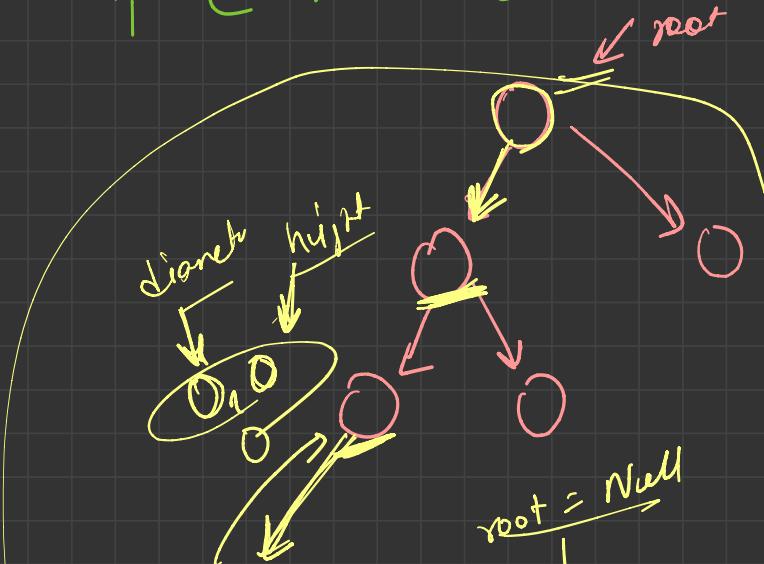
max {

op 1 = diameter (root → left) ✓

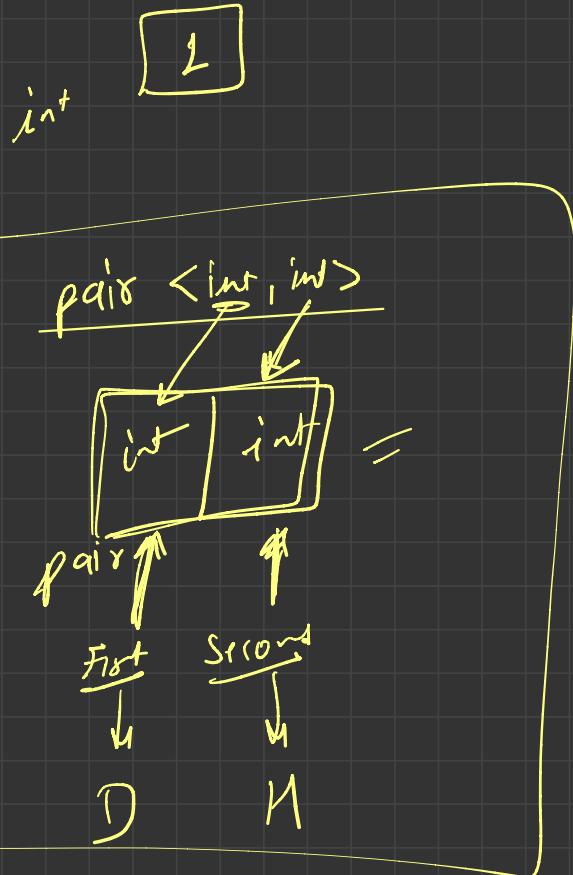
op 2 → diameter (root → right) ✓

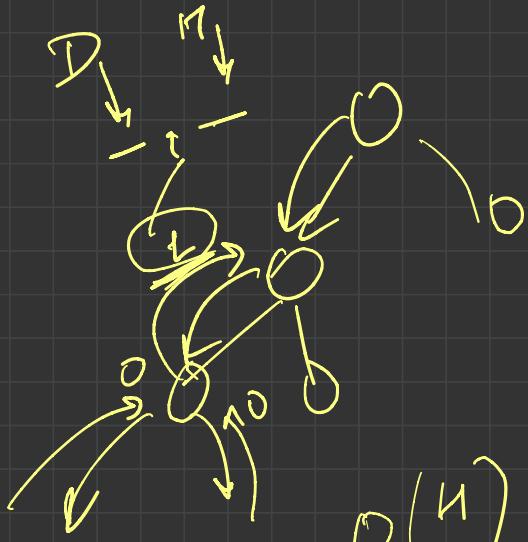
op 3 = height (root → left) + 1 + height (root → right)

$T \cdot C \rightarrow O(n^2) \rightarrow$ Optimize - ?



$\text{root} = \text{Null}$
 $D = 0$
 $H = 0$





int
 $\text{pair}\langle\text{int}, \text{int}\rangle$

$O(n)$
 S.C

class mystore

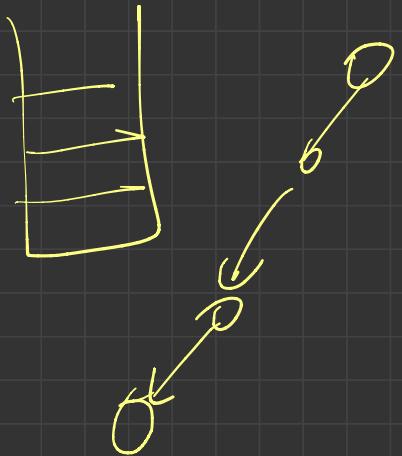
{

int a

int b

int c

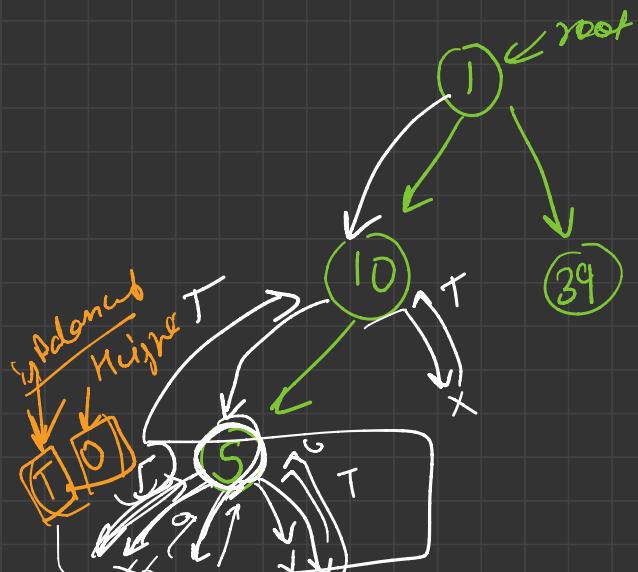
}



→

check for Balanced Tree

$$\text{abs} \left[\text{height (left)} - \text{height (right)} \right] \leq 1$$



{

left abs $\nearrow T$

right abs $\nearrow T$

$h(l) - h(r) \leq 1$ $\rightarrow T_{\text{un}}$

$0 - 0 \leq 1$

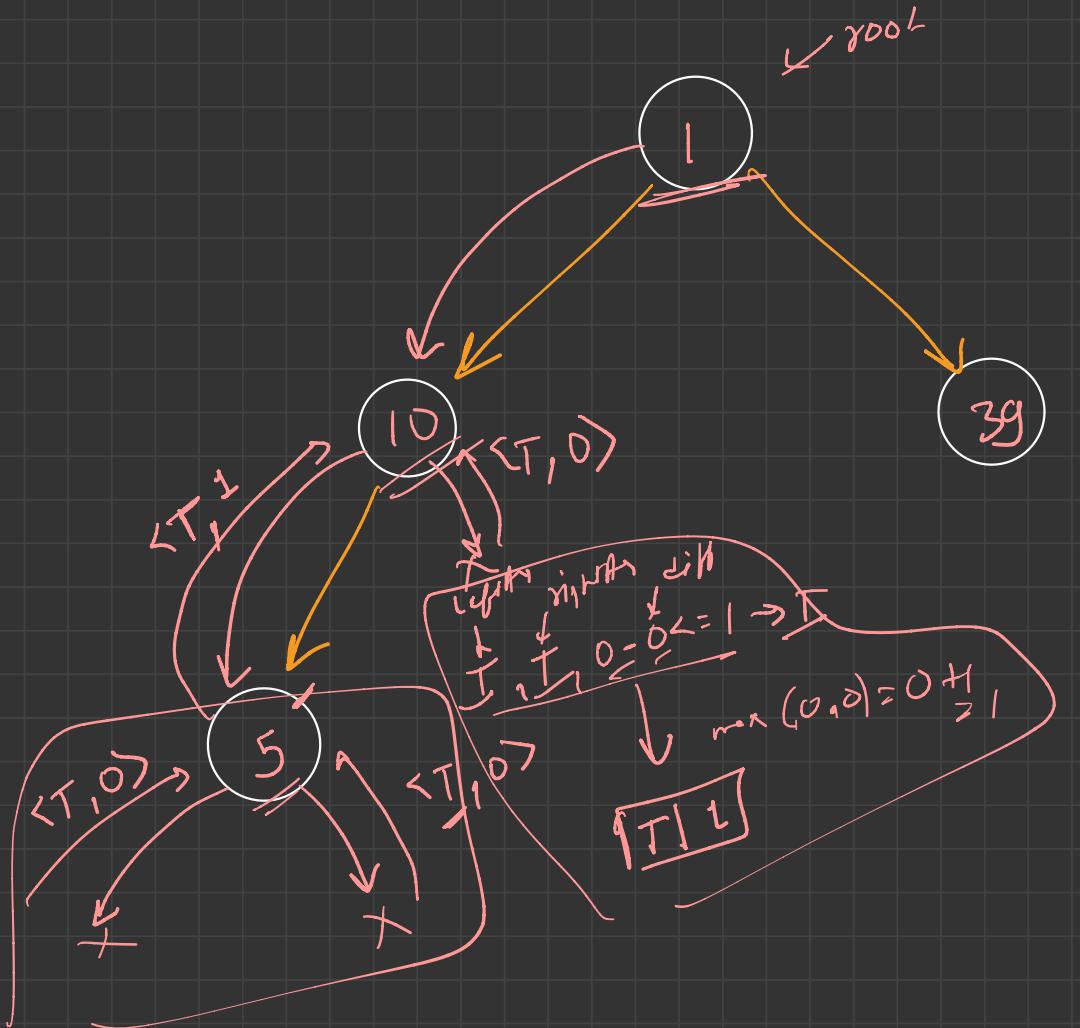
5. Andere

$0 \leq i \rightarrow \text{TRUE}$

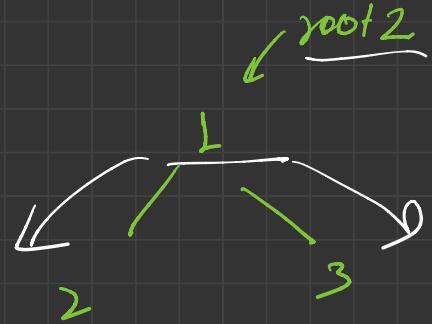
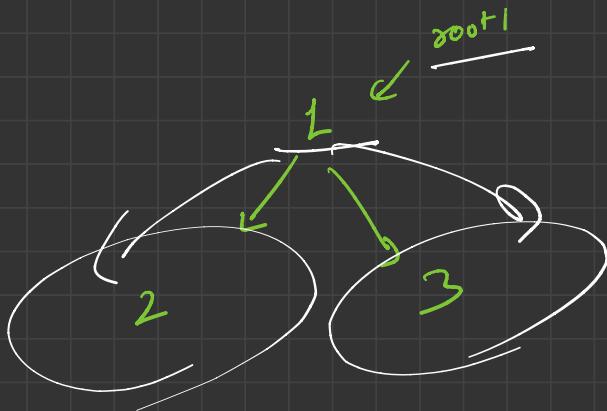
$$T.C \rightarrow \begin{cases} O(n^2) \\ O(n) \end{cases}$$

$$T.C \rightarrow \underline{\underline{O(n)}}$$

10



\Rightarrow Identical Trees



Recursion

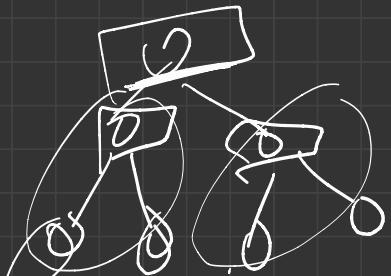
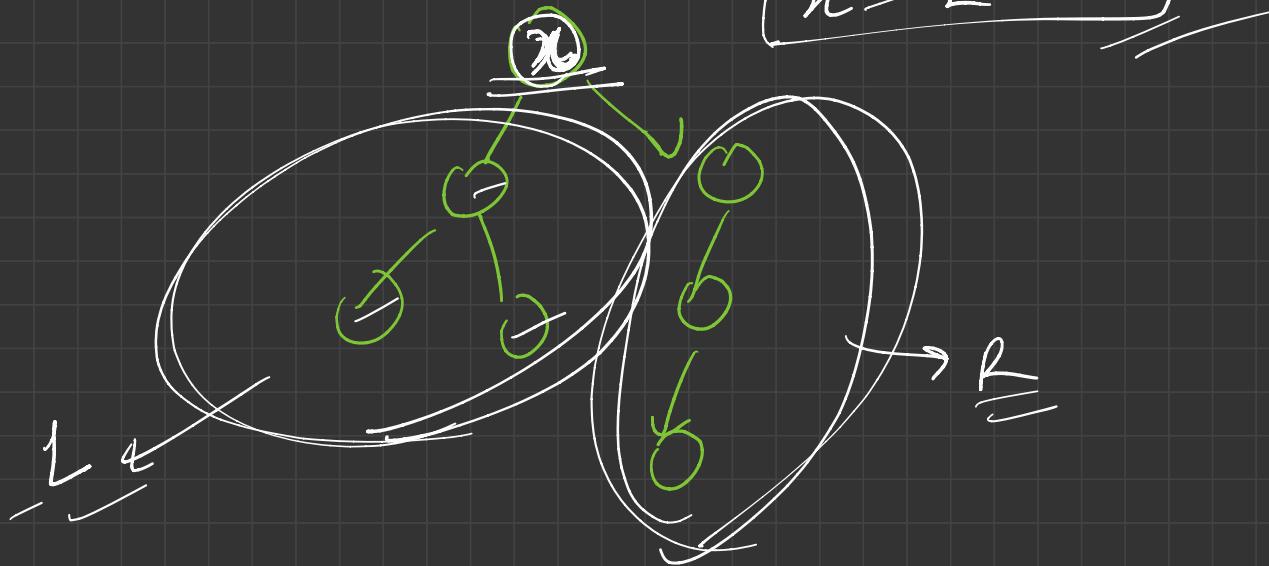
\rightarrow node value Left, Right
 |
 fals
 |
 value fals

$T \hookrightarrow O(n)$

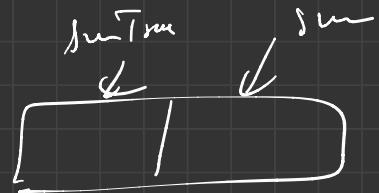
$S \cdot C^{-1} \quad H/k$

→ Check Sum Tree or Not

$$n = L + R$$



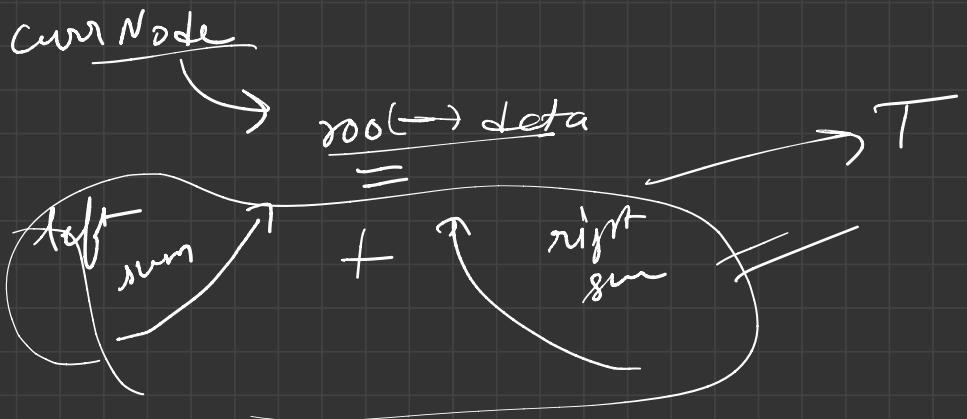
ans

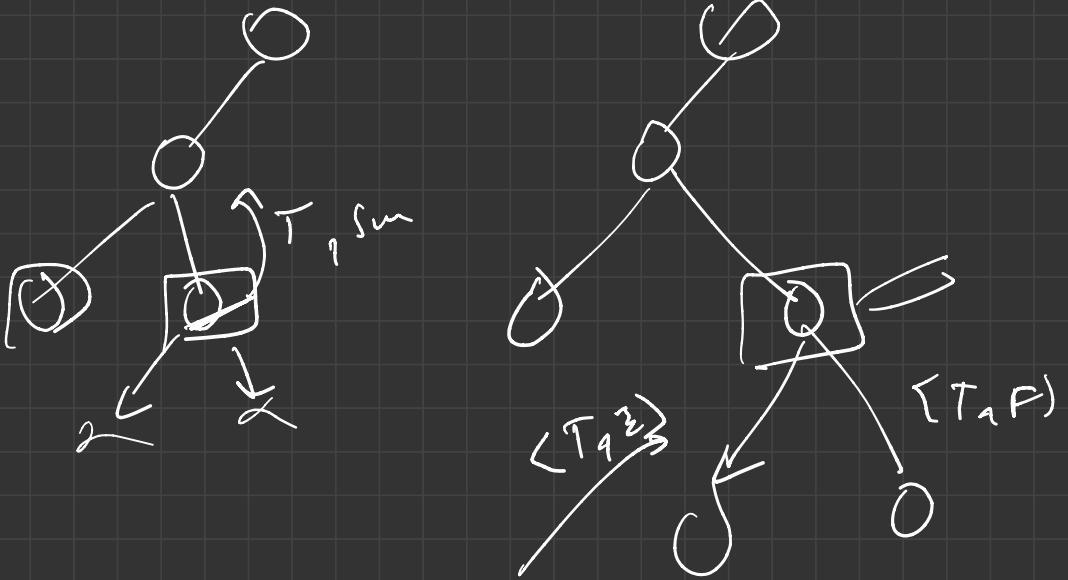


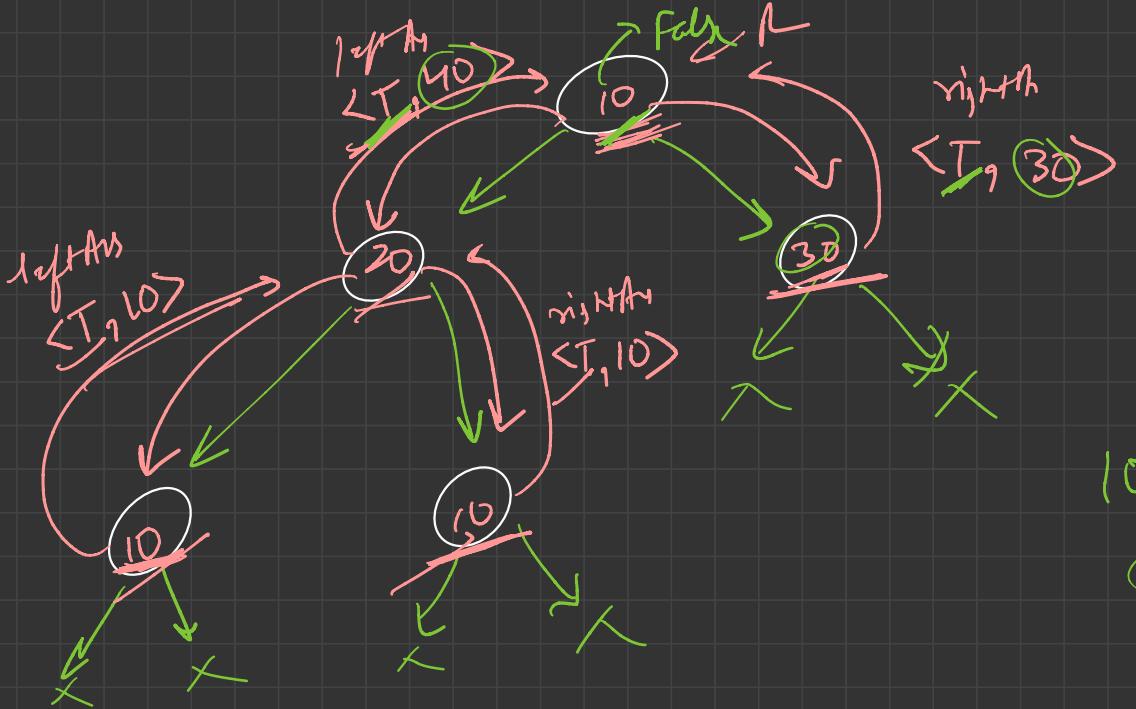
isSum → T/F
sum → int

W
V T/F 0

→ isSum (root → left) → T
→ isSum (root → right) → T







$$20 == 10 + 10$$

$$10 == 10 + 30$$

$$10 == 70$$

$T \hookrightarrow O(n)$

$S \hookrightarrow O(H)$

