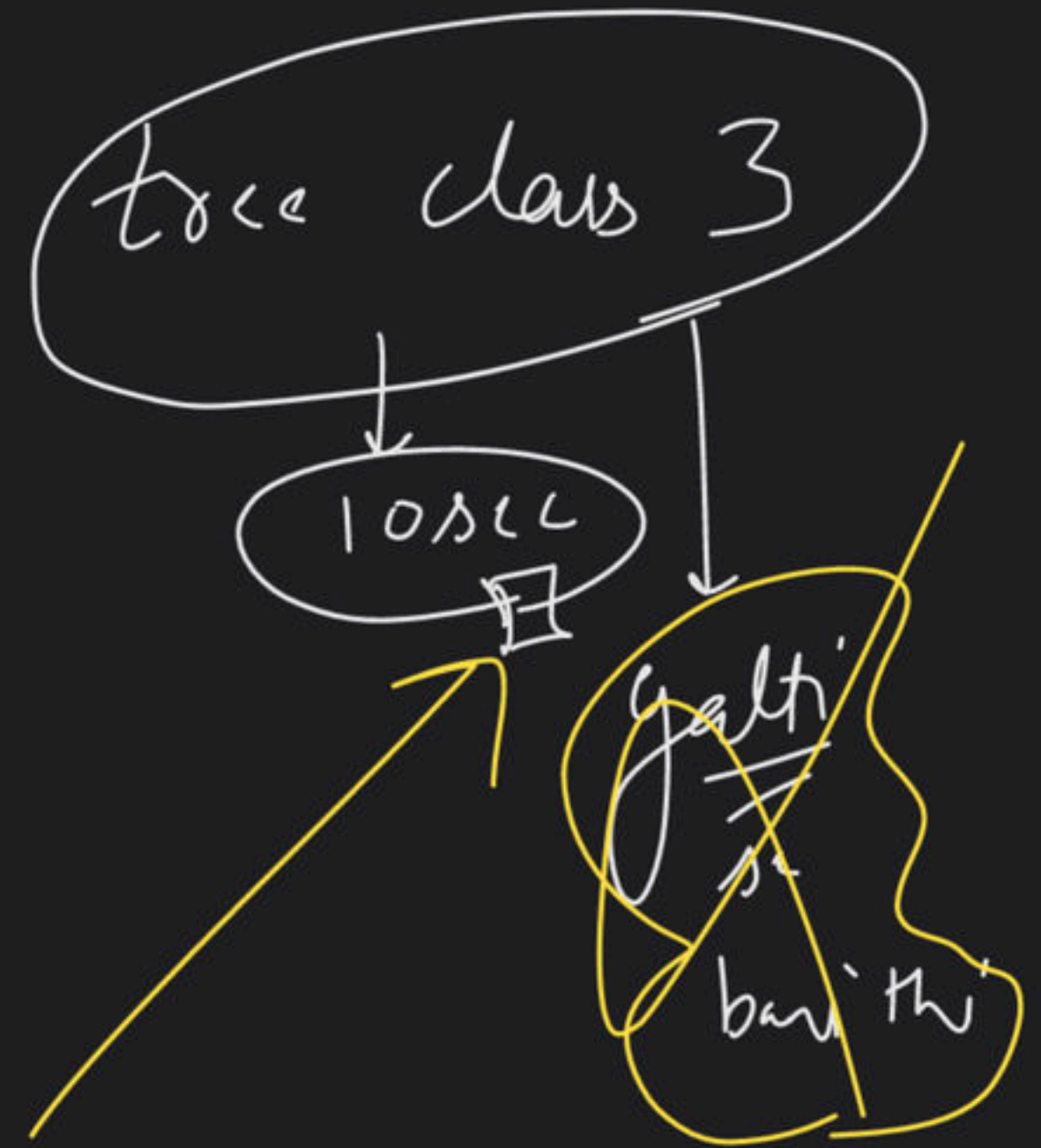
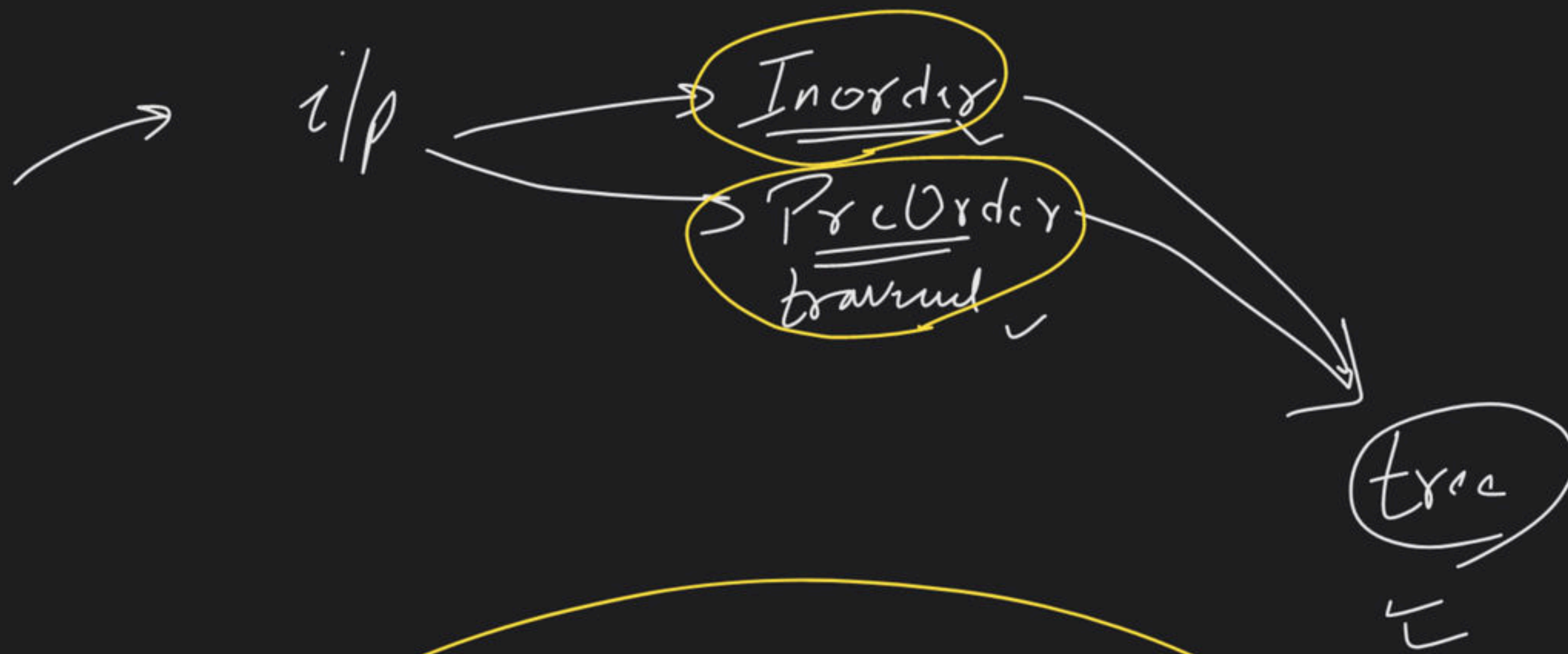




# Trees Class - 4

Special class

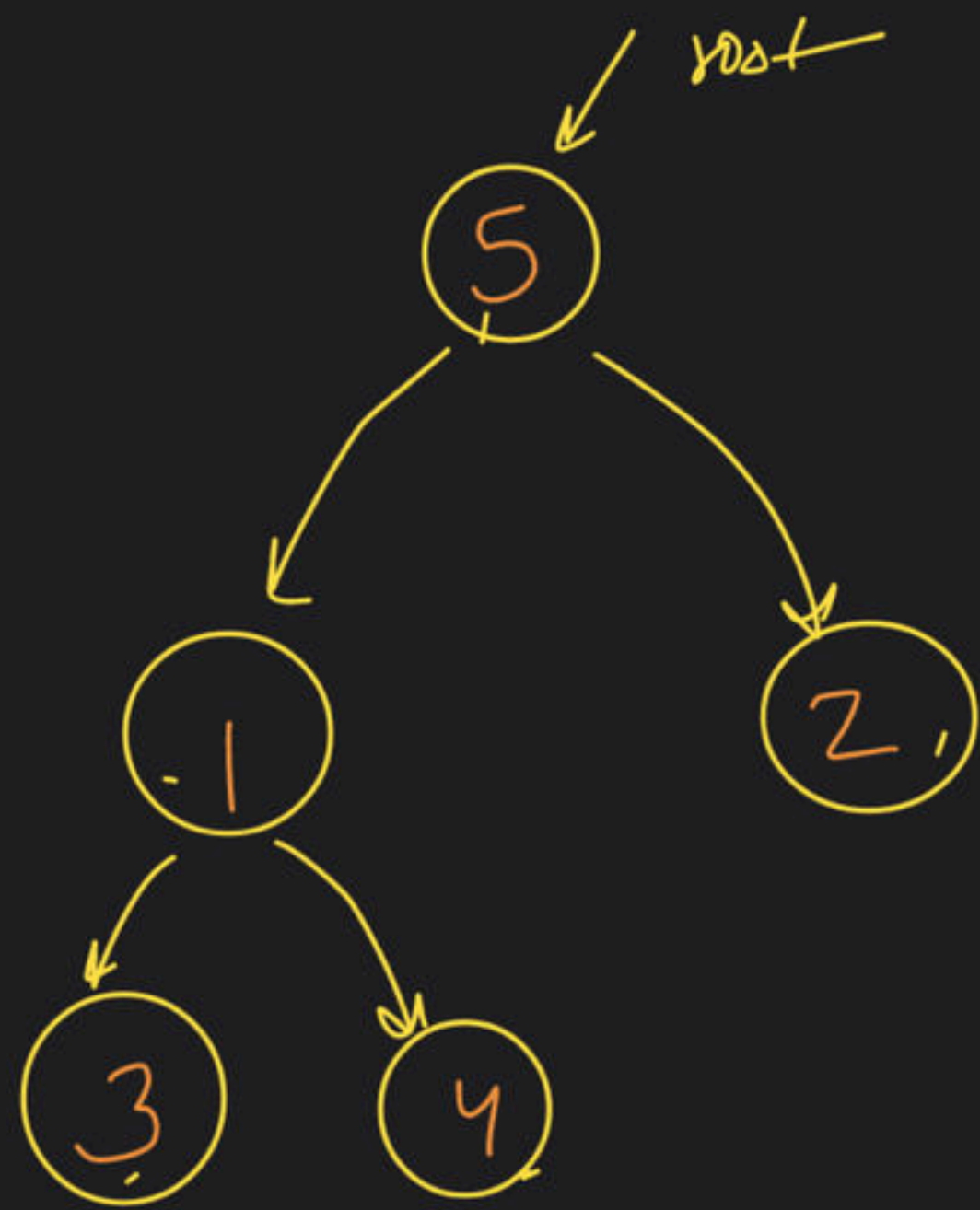


Inorder  $\rightarrow$  LNR

PreOrder  $\rightarrow$  NLR

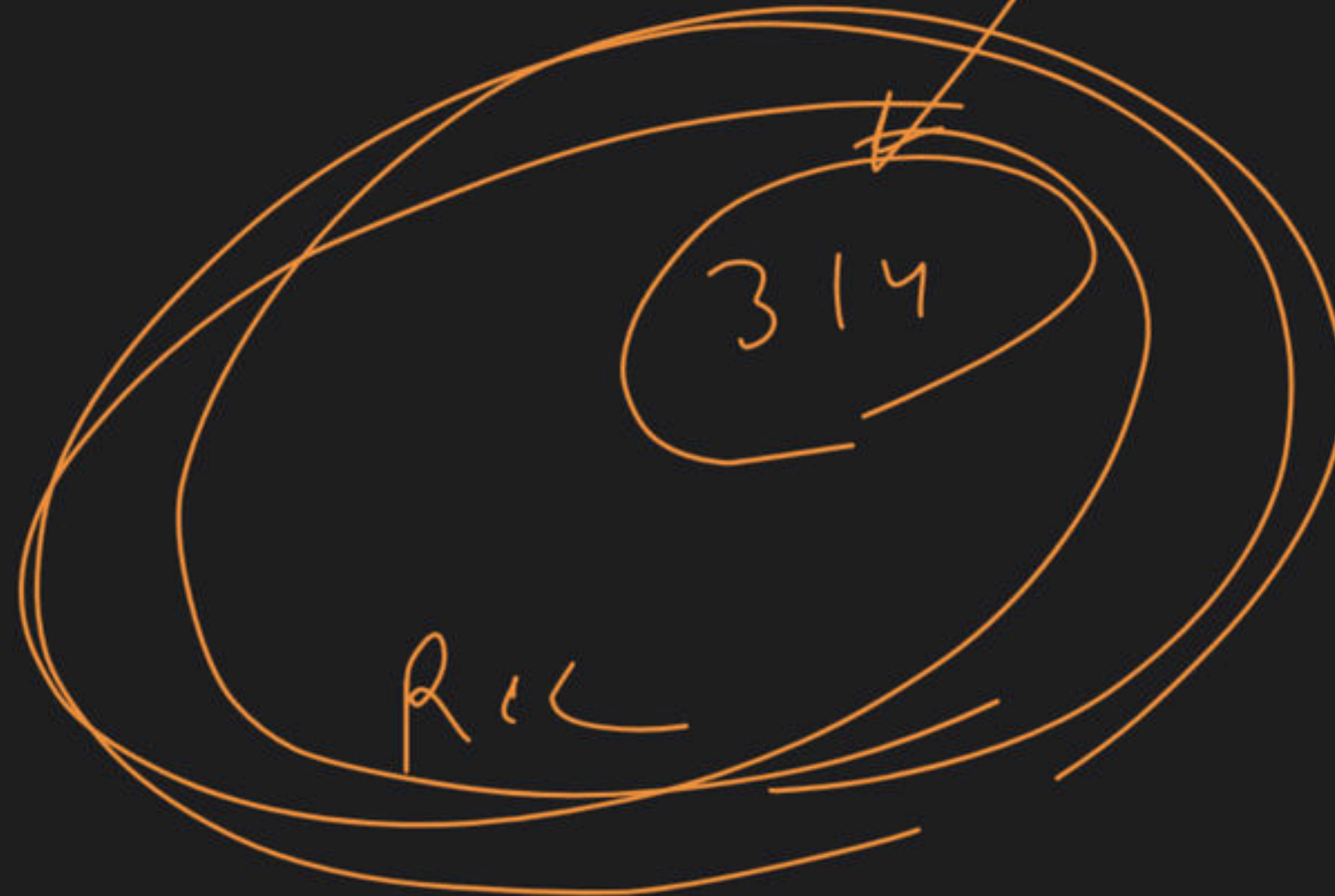
PostOrder  $\rightarrow$  LRN





LNK  
Inorder: 3 1 4 5 2

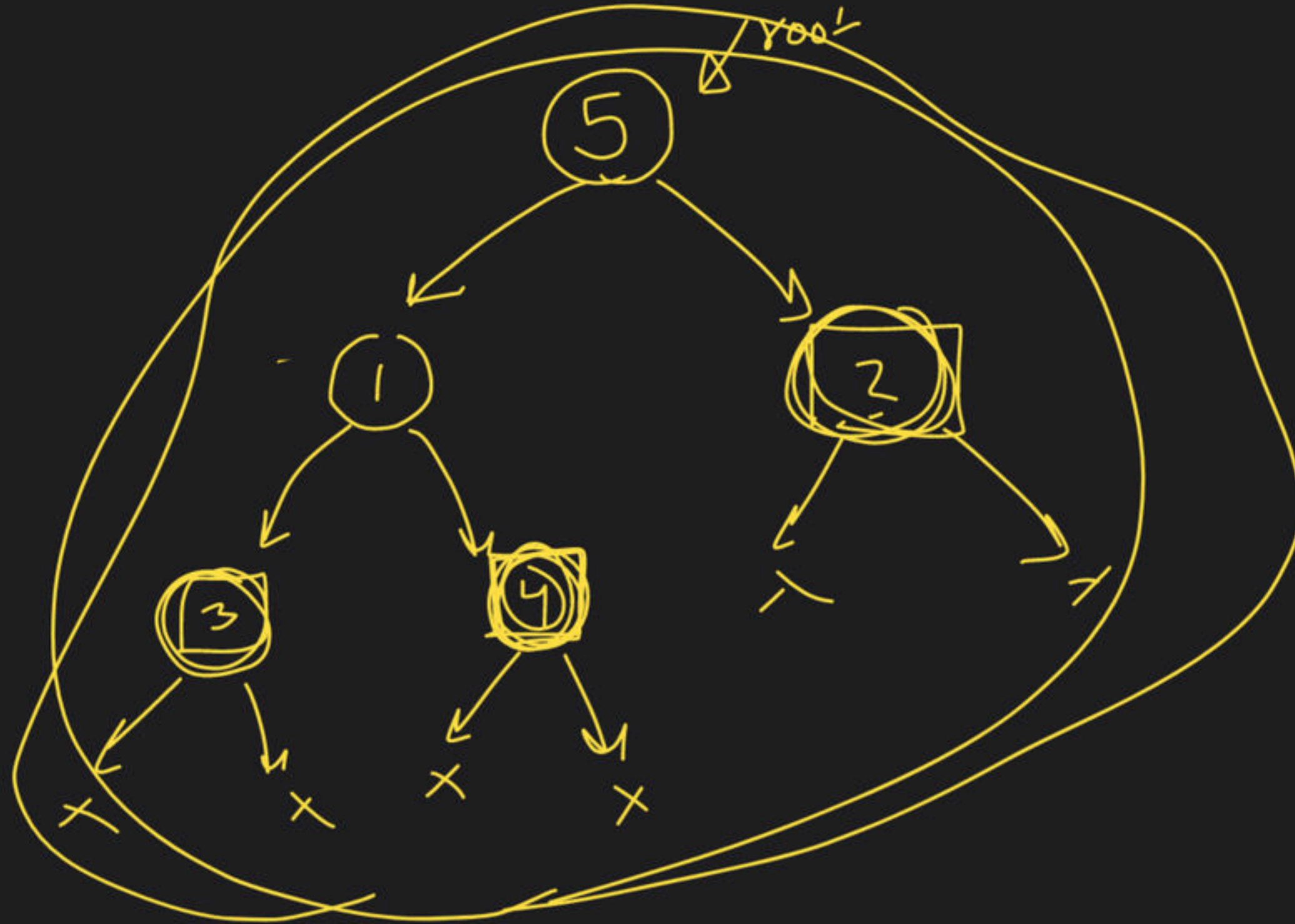
NLK  
Preorder → 5 1 3 4 2







tree



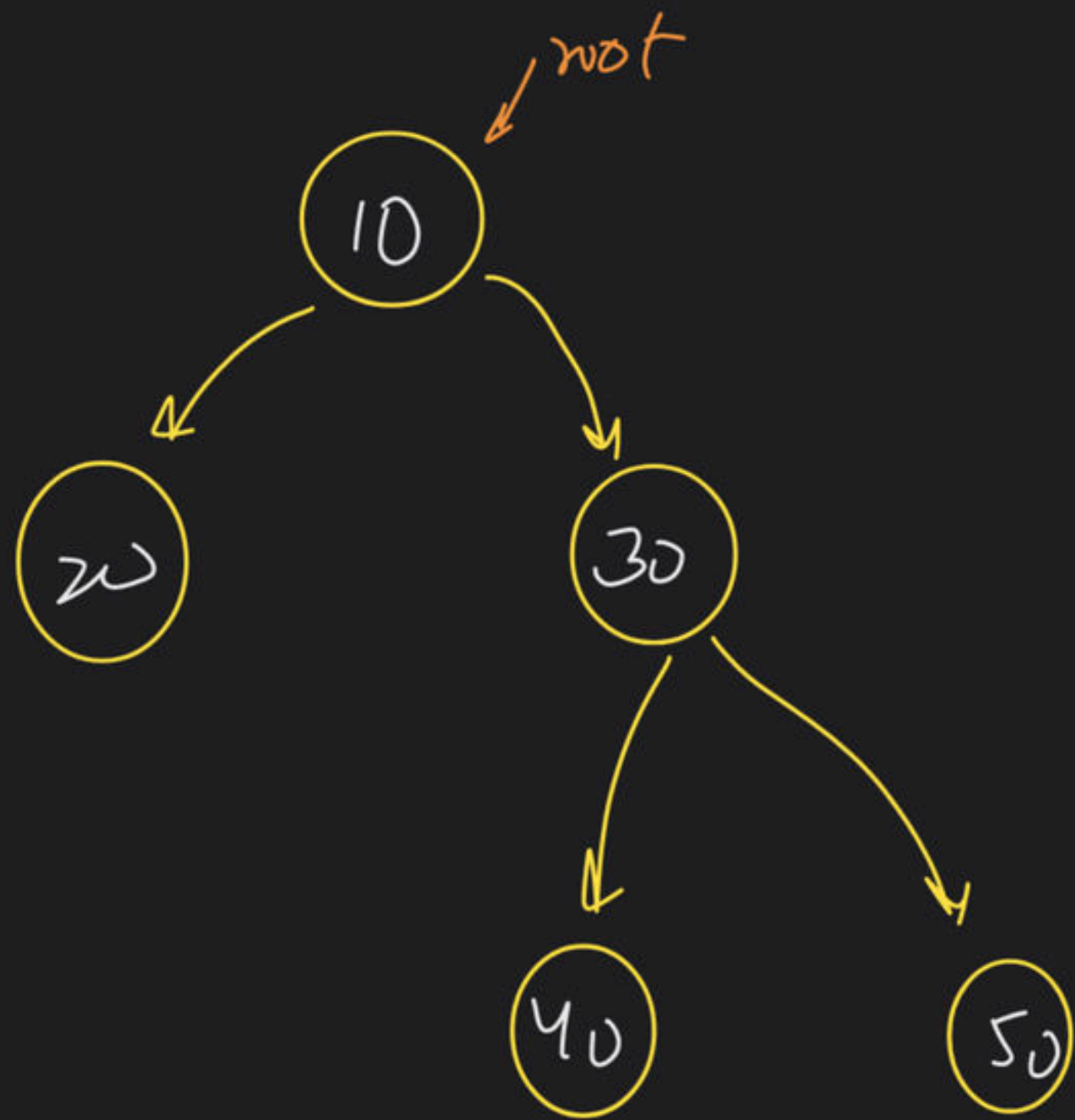
inorder → 2

in → 3 | 1 | 4

pre

inorder → 3

in → 4



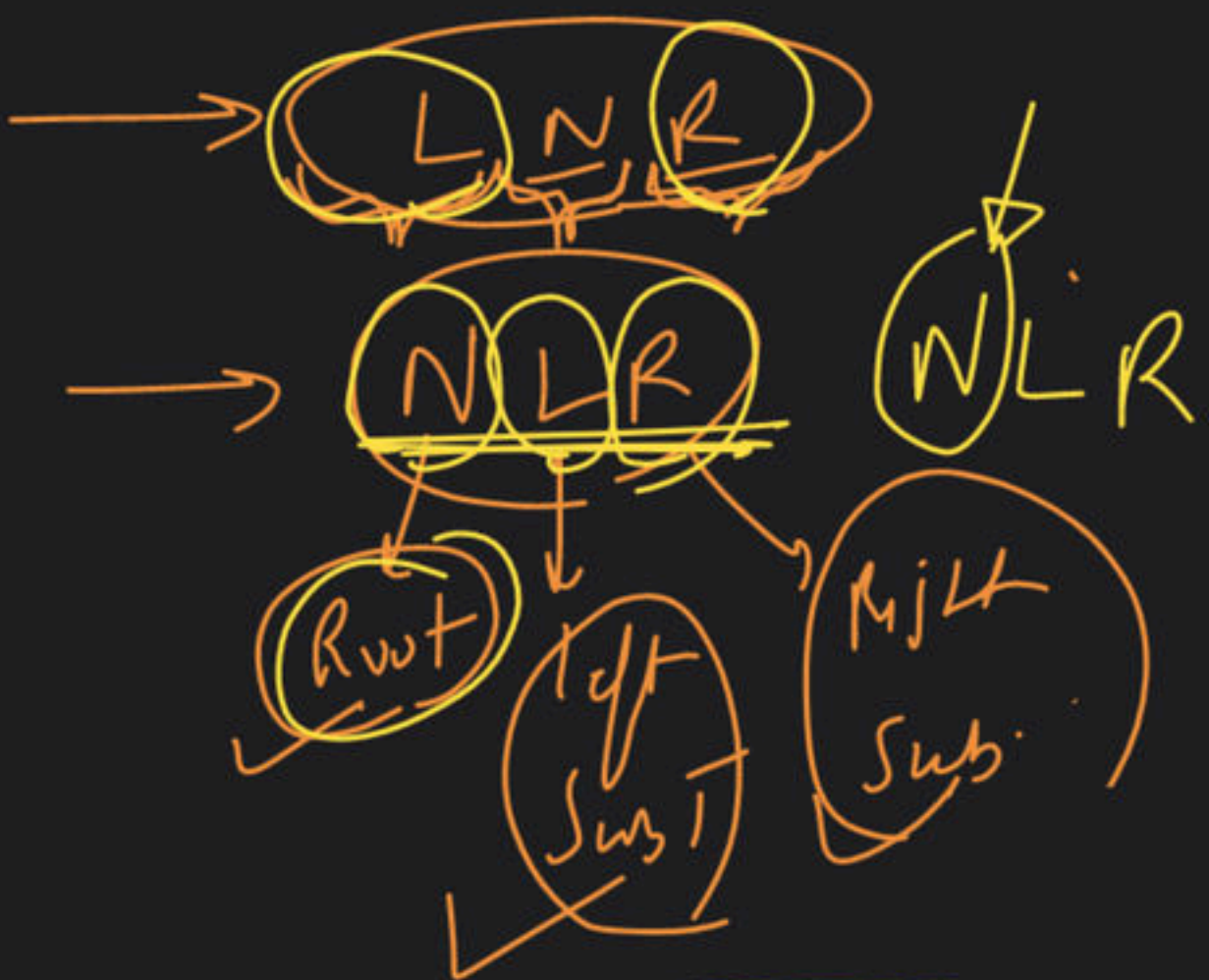
LN R

inorder	→	20	10	40	30	50
preorder	→	10	20	30	40	50

NLR



inorder  $\rightarrow$  20, 10 <sup>N Root</sup> 40 30 50  
 preOrder  $\rightarrow$  10 20 30 40 50  
 root  $\rightarrow$  10



tree  $\rightarrow$  1 node

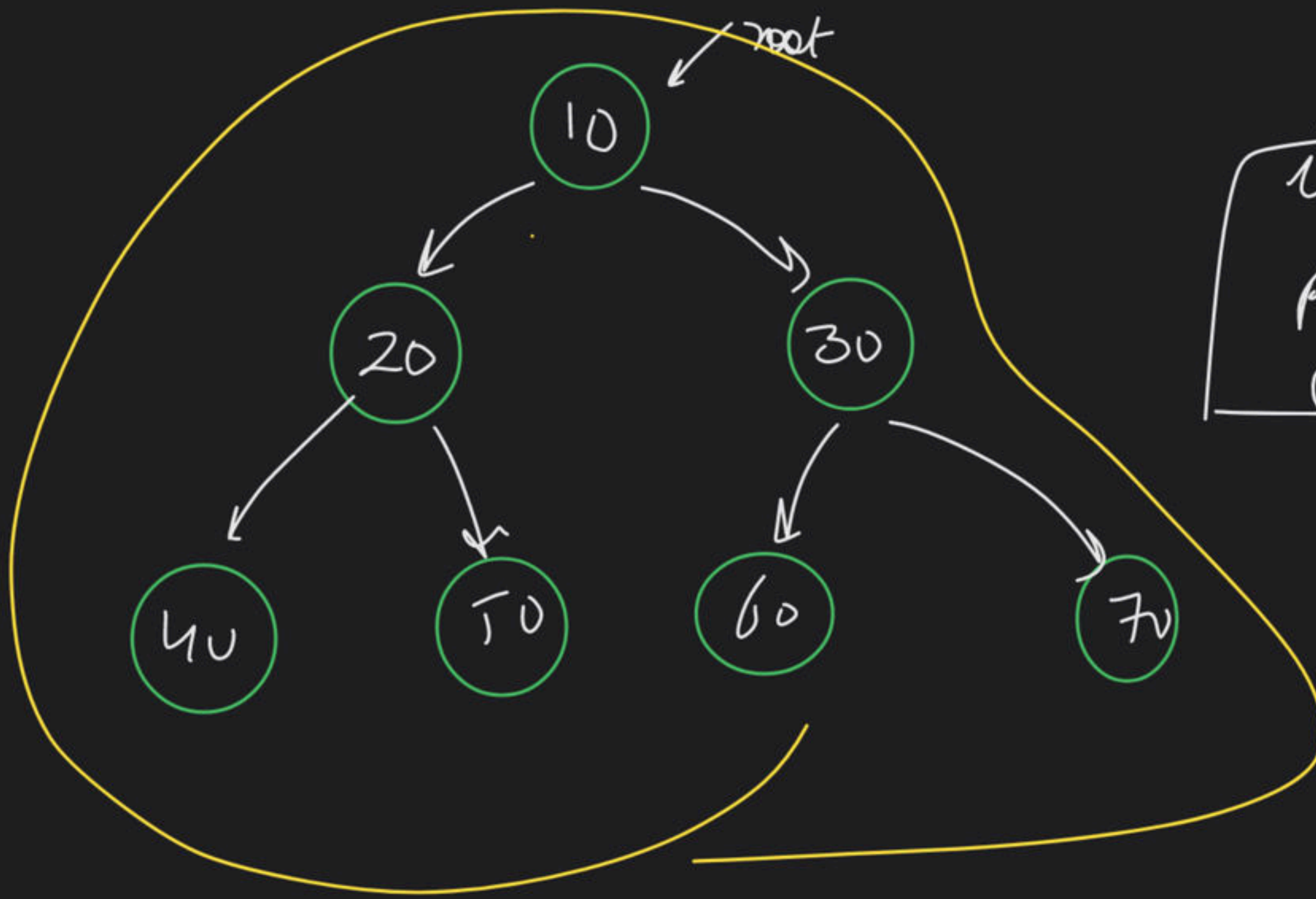


inorder  $\rightarrow$  40 30 50 <sup>Root</sup>



inorder  $\rightarrow$  40  
 inorder  $\rightarrow$  50





LNR

inorder  $\rightarrow$  40 20 50 10 60 30 70

preorder  $\rightarrow$  10 20 40 50 30 60 70

NLR



inorder →

0			$i-1$	$i$	$i+1$		$k+1$
40	20	50	10	60	30	70	

preOrder →

10	20	40	50	30	60	70	
----	----	----	----	----	----	----	--

inorder →

40	20	50
----	----	----

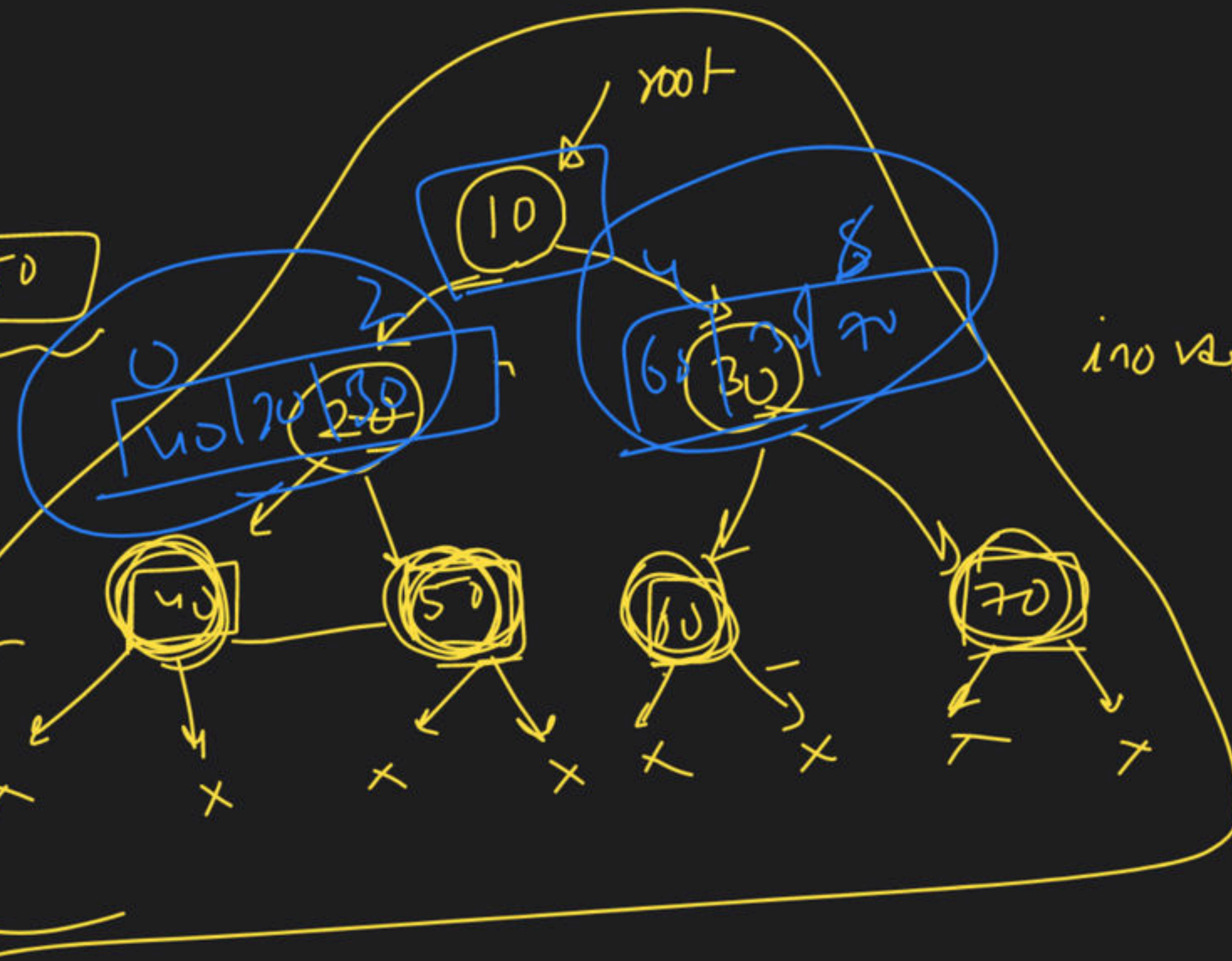
inorder →

40
----

inorder →

50
----

root



inorder →

60	30	70
----	----	----

inorder →

60
----

inorder → 70

(A)

root  
crash  
Karo

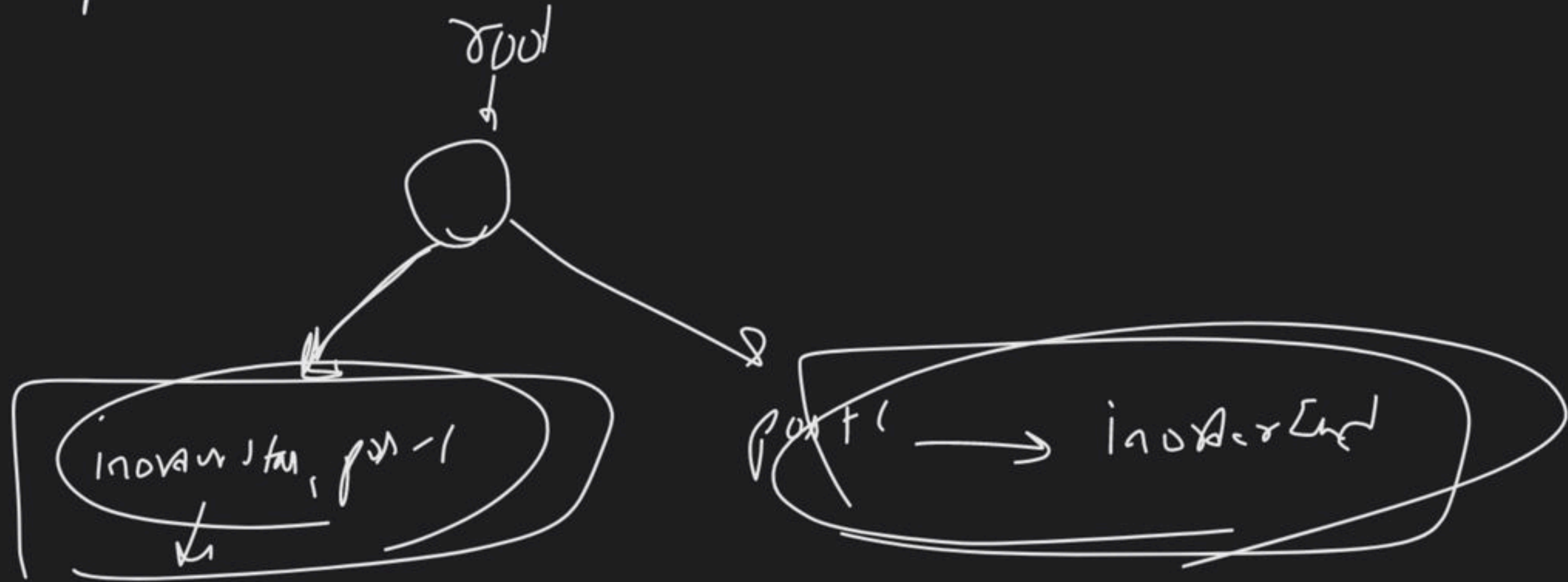
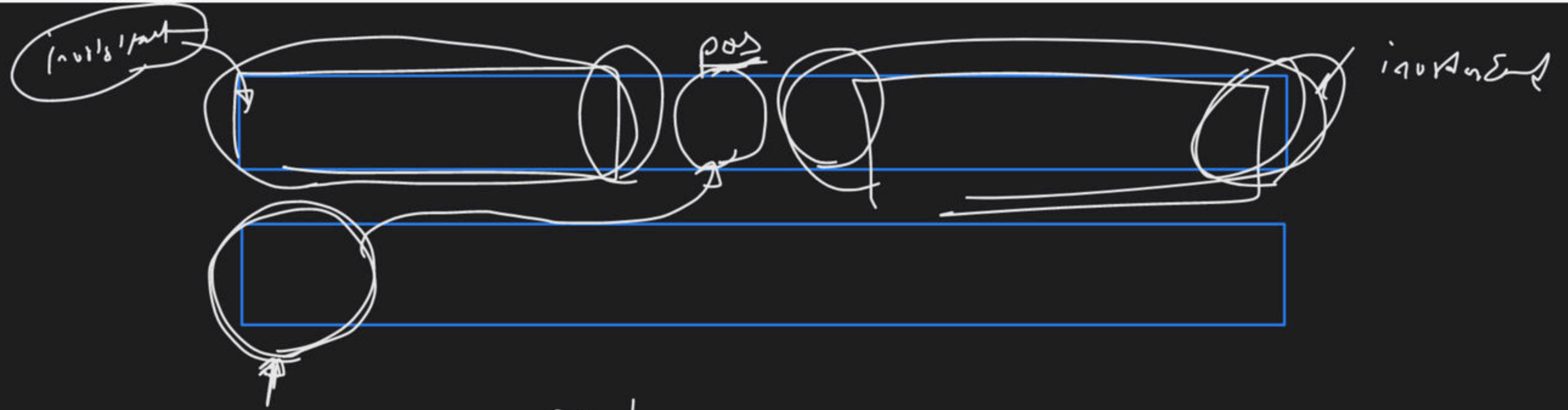
(B)

root → left  
R.L.

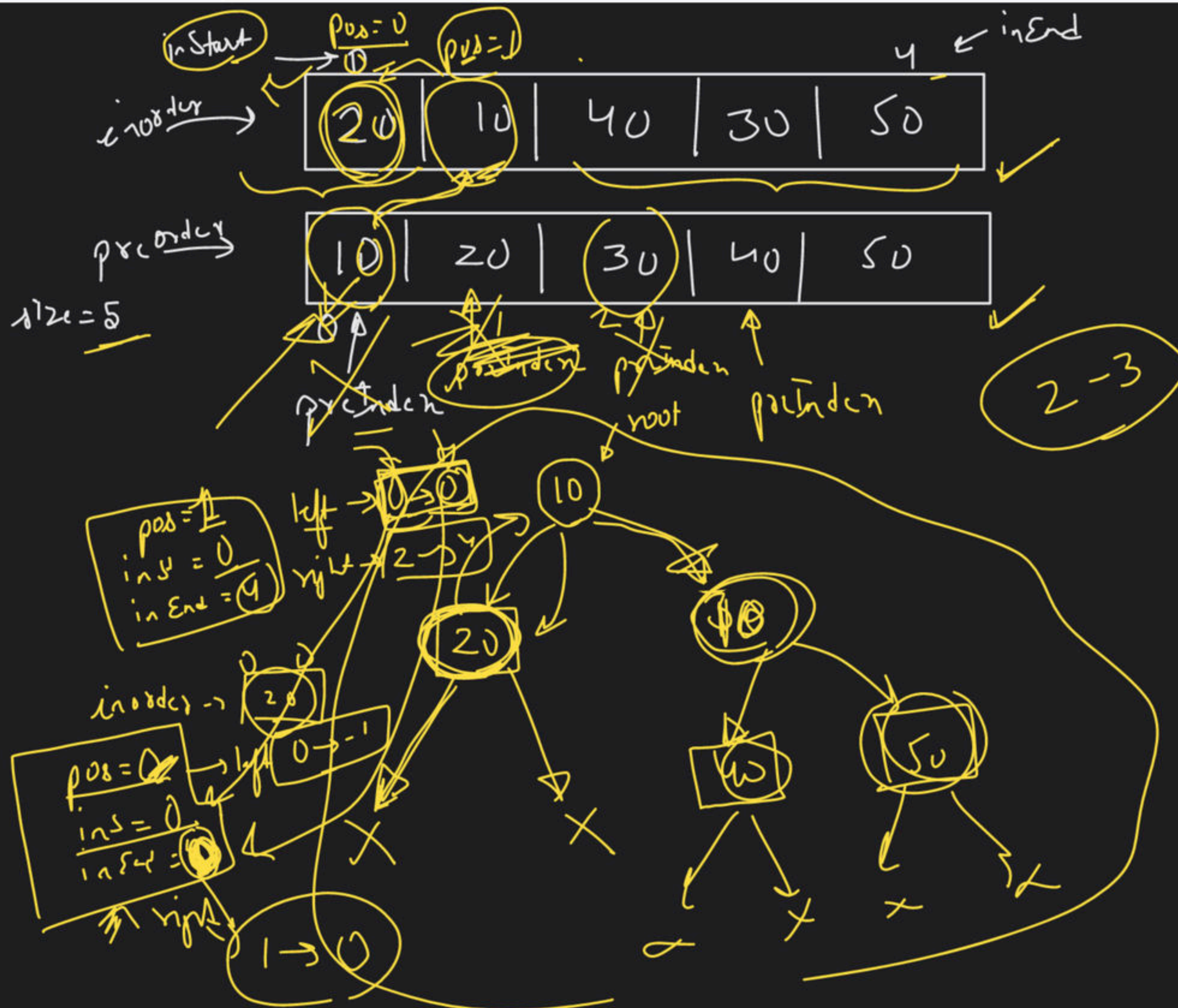
(C)

root → right  
R.C.

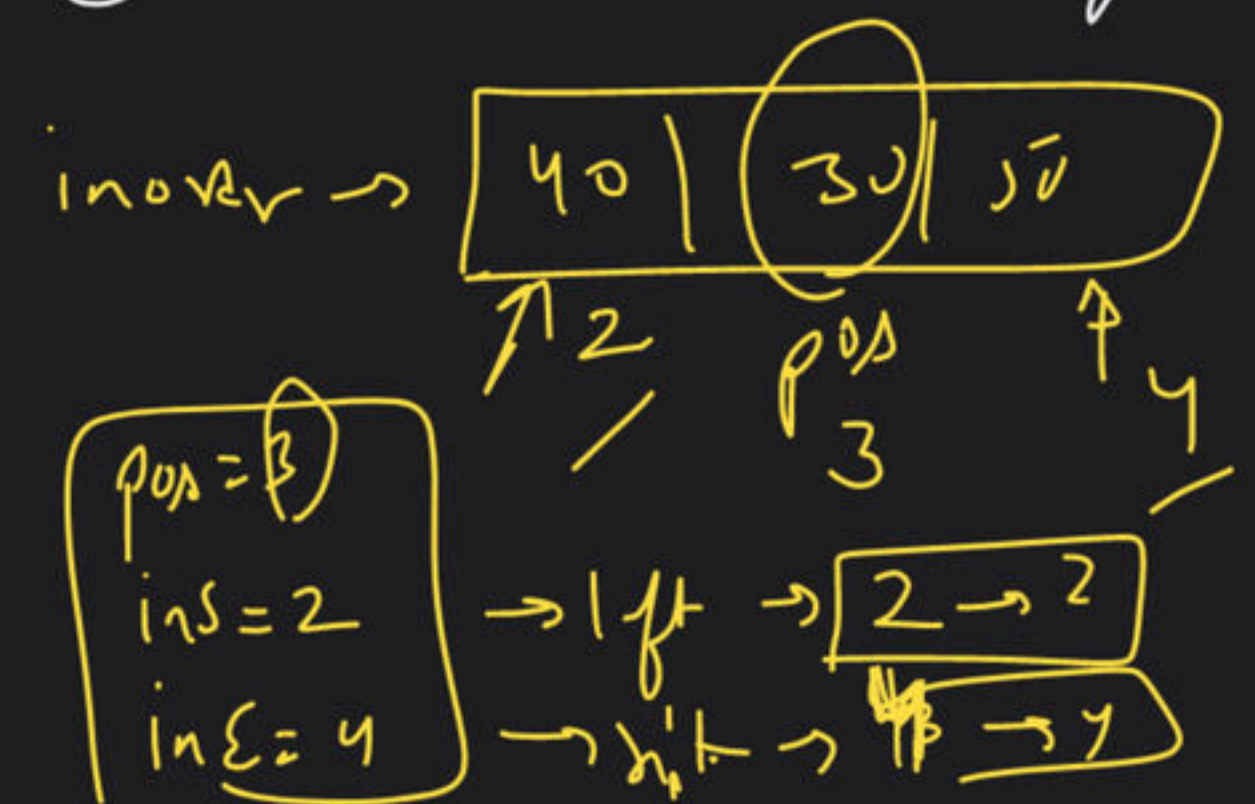








- (code)
- ① B.C  
 $\text{preIndex} > n$  ||  $\text{inStart} > \text{inEnd}$   
 when NULL
- ② create root node with value present at  $\text{preIndex}$   
 $\text{preIndex}++$
- ③ solve for root → left
- ④ \_\_\_\_\_ root → right

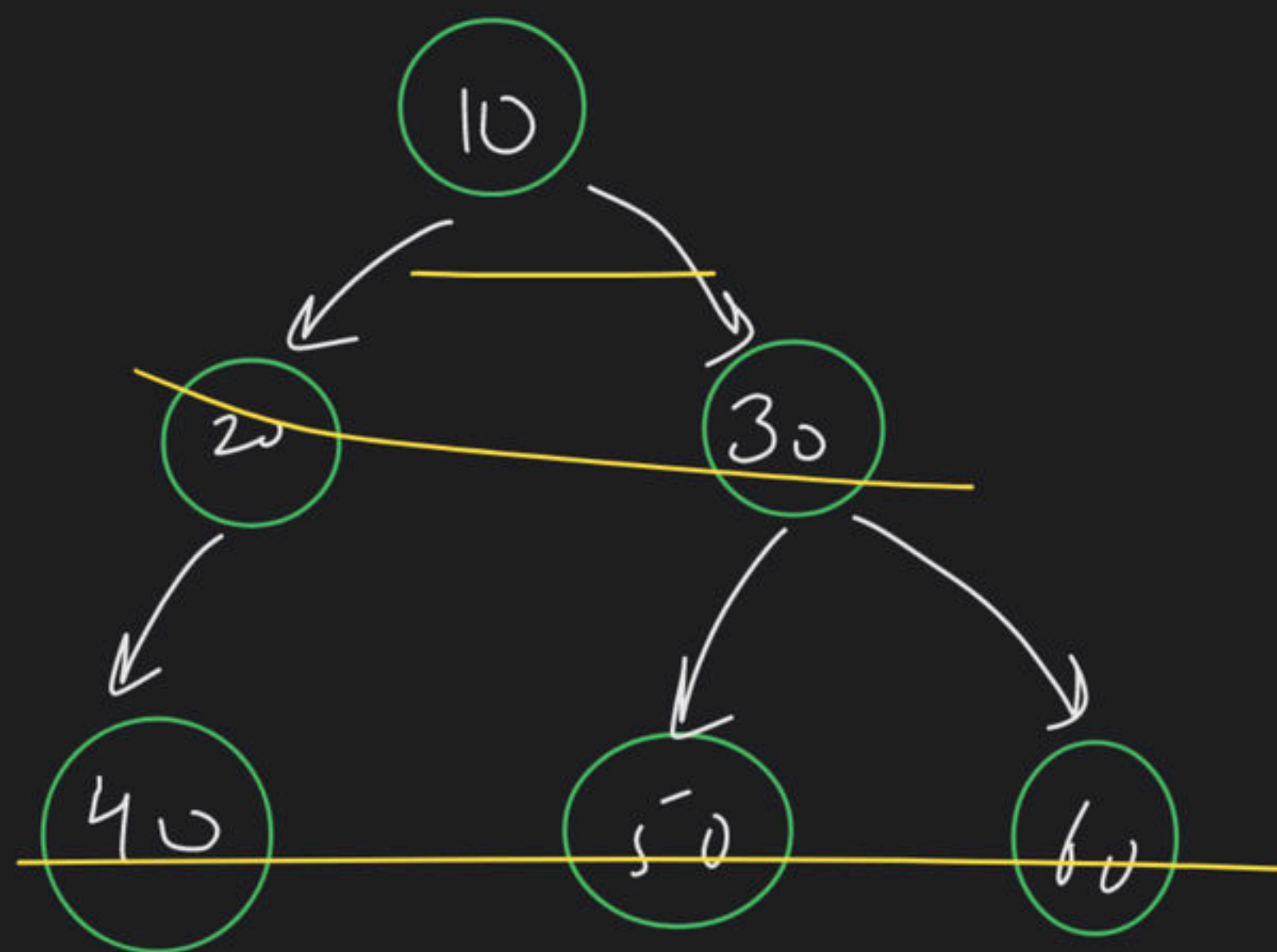






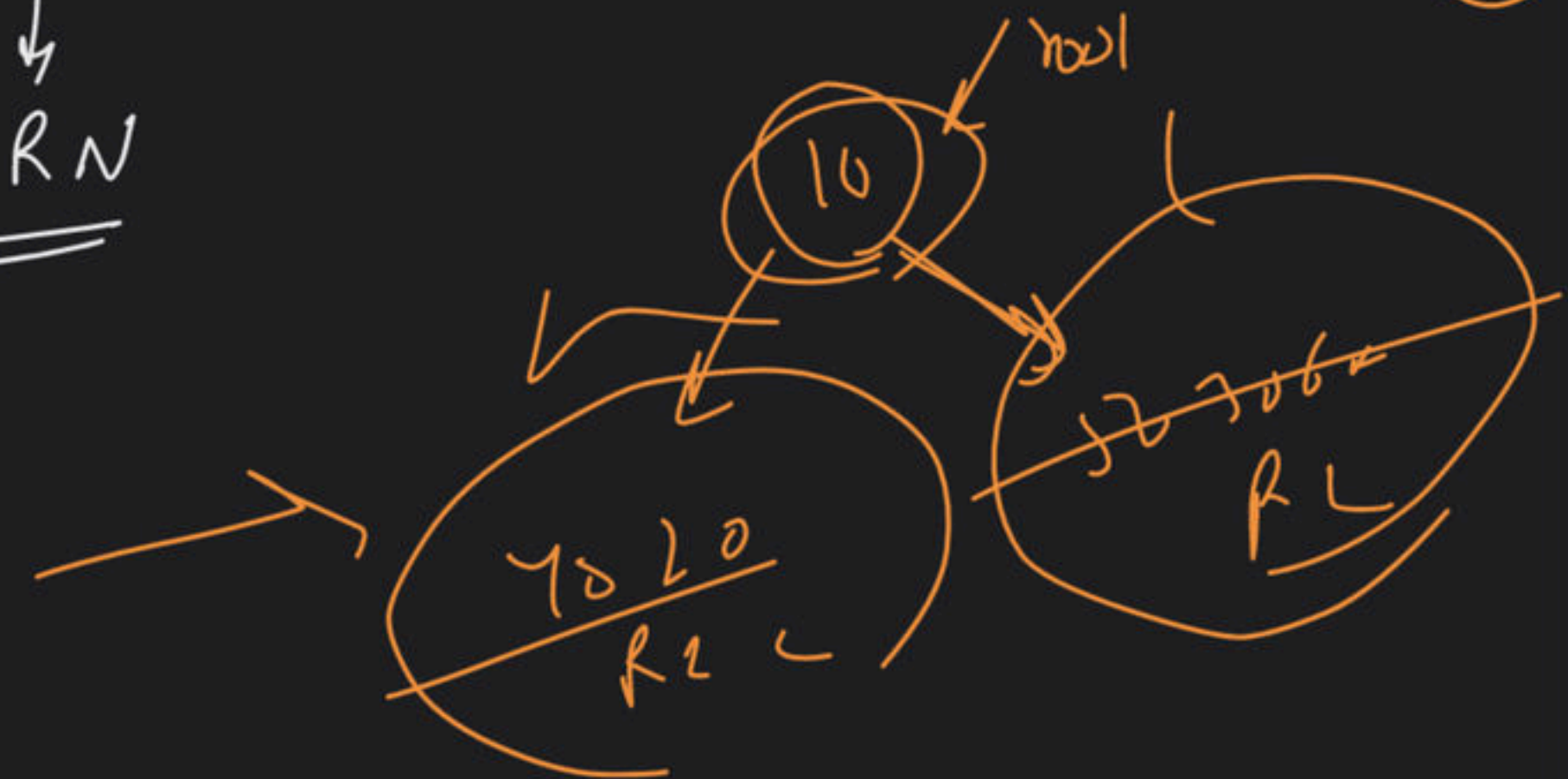


→ Create a Tree using → Inorder  
postOrder



LNR  
 → Inorder → 40 20 10 50 30 60  
 → postorder → 40 20 50 60 30 10

↓  
LRN





inorder → 

40	20	10	50	30	60
----	----	----	----	----	----

 →  $\begin{matrix} L & N & R \\ \text{Left} & \text{Root} & \text{Right} \end{matrix}$

postOrder → 

40	20	50	60	30	10
----	----	----	----	----	----

 →  $\begin{matrix} L & R & N \\ \text{Left} & \text{Right} & \text{Root} \end{matrix}$

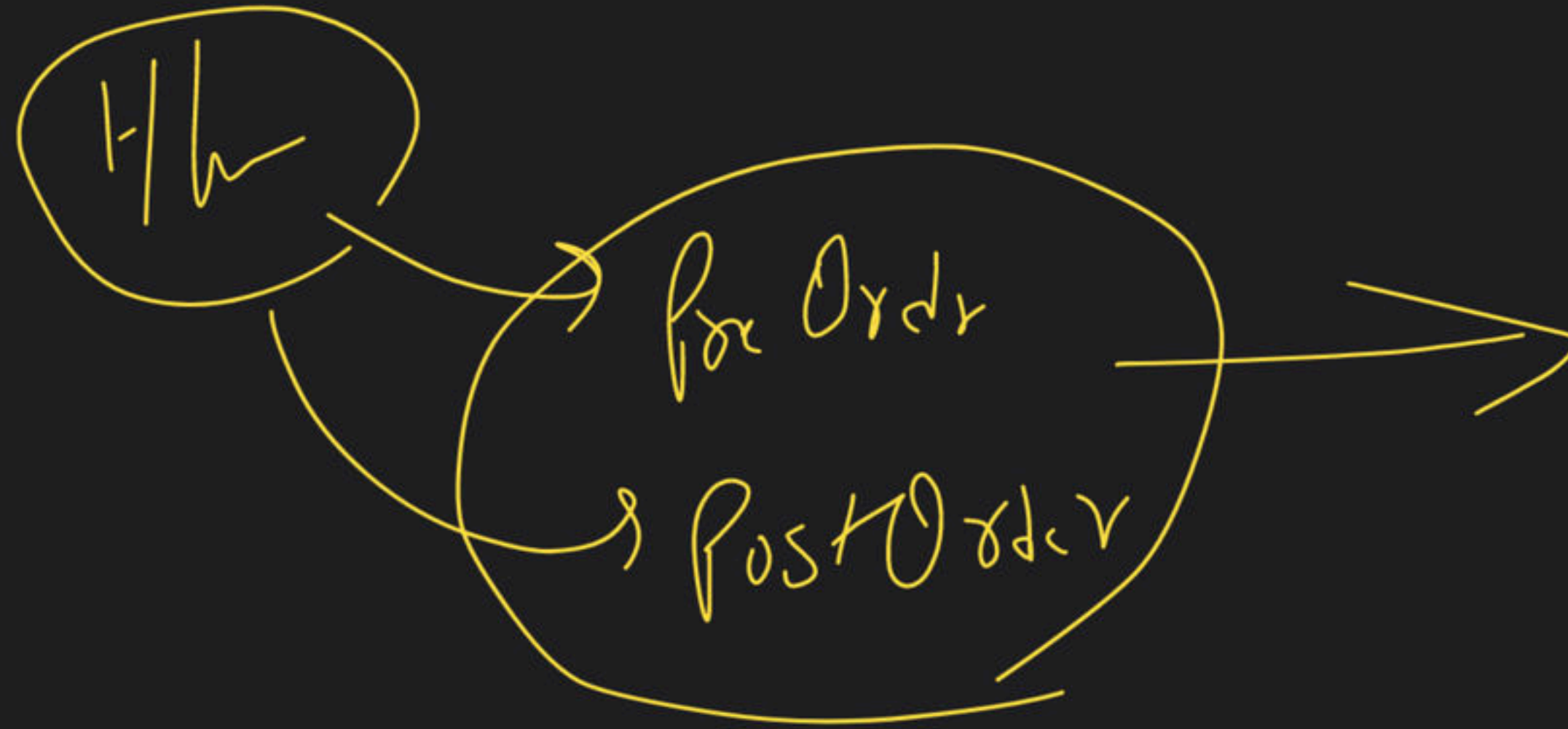
postIndex



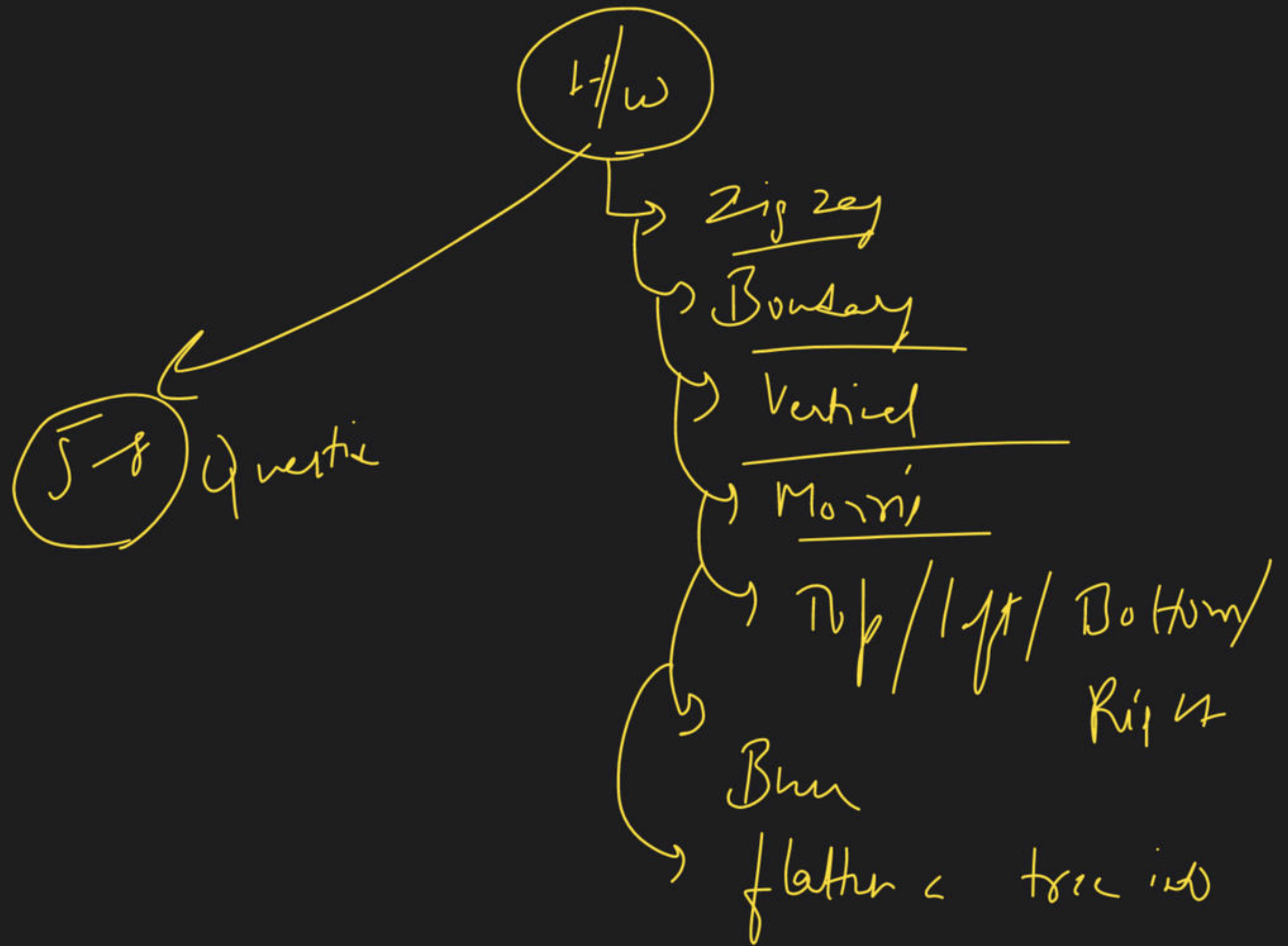
postOrder →  $\begin{matrix} L & R & N \\ \text{Left} & \text{Right} & \text{Root} \end{matrix}$







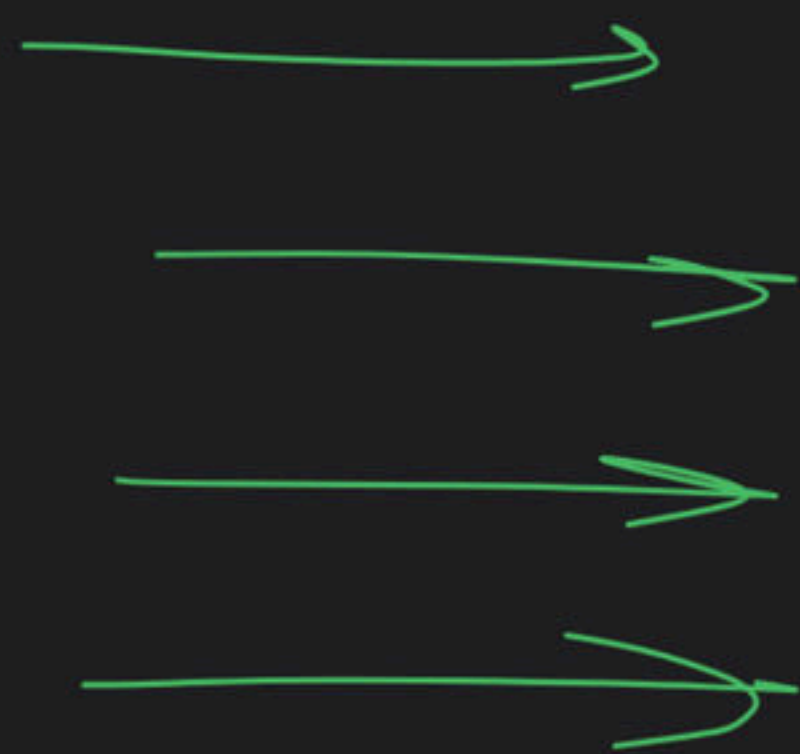
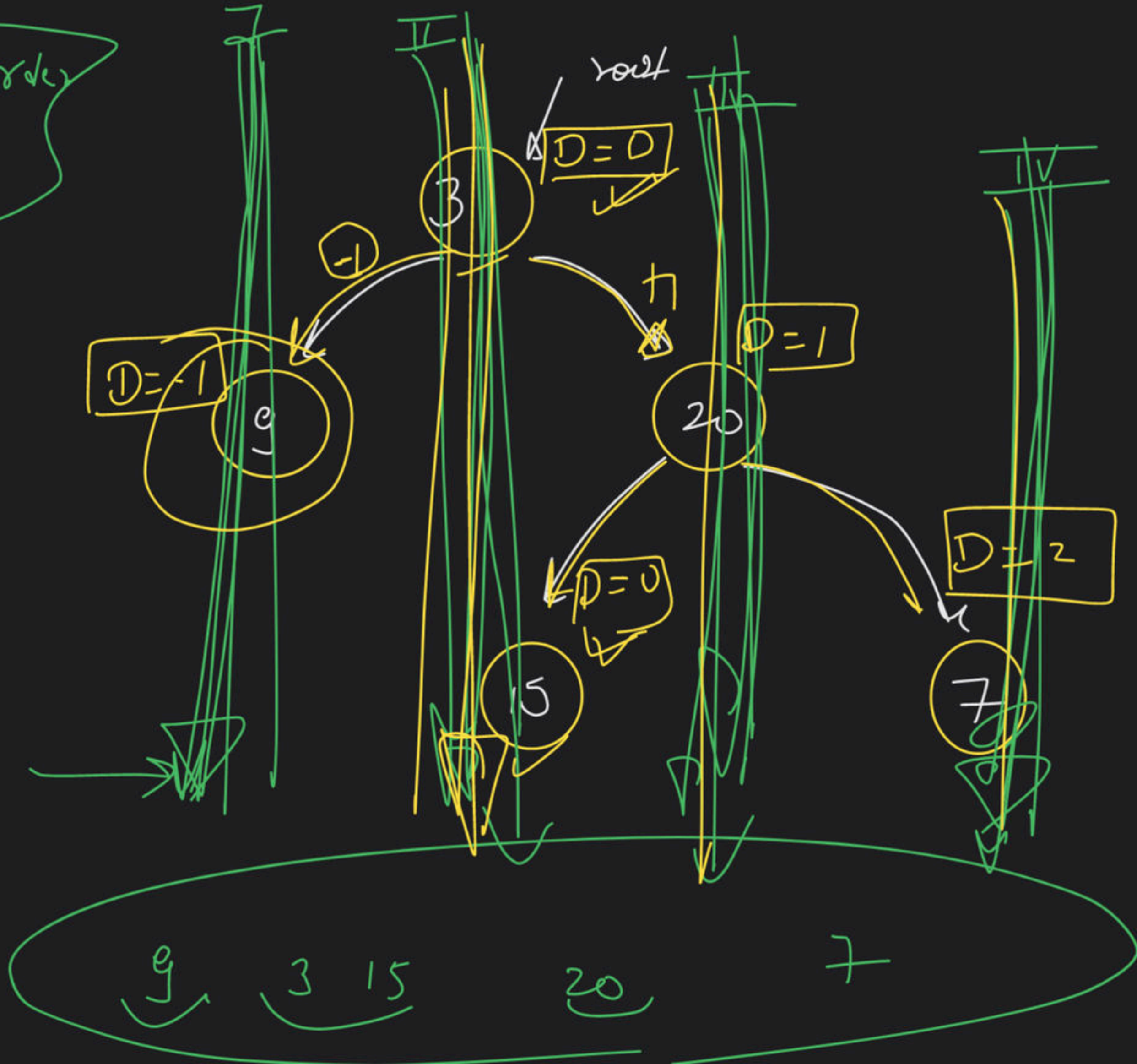




Vertical Order Traversal

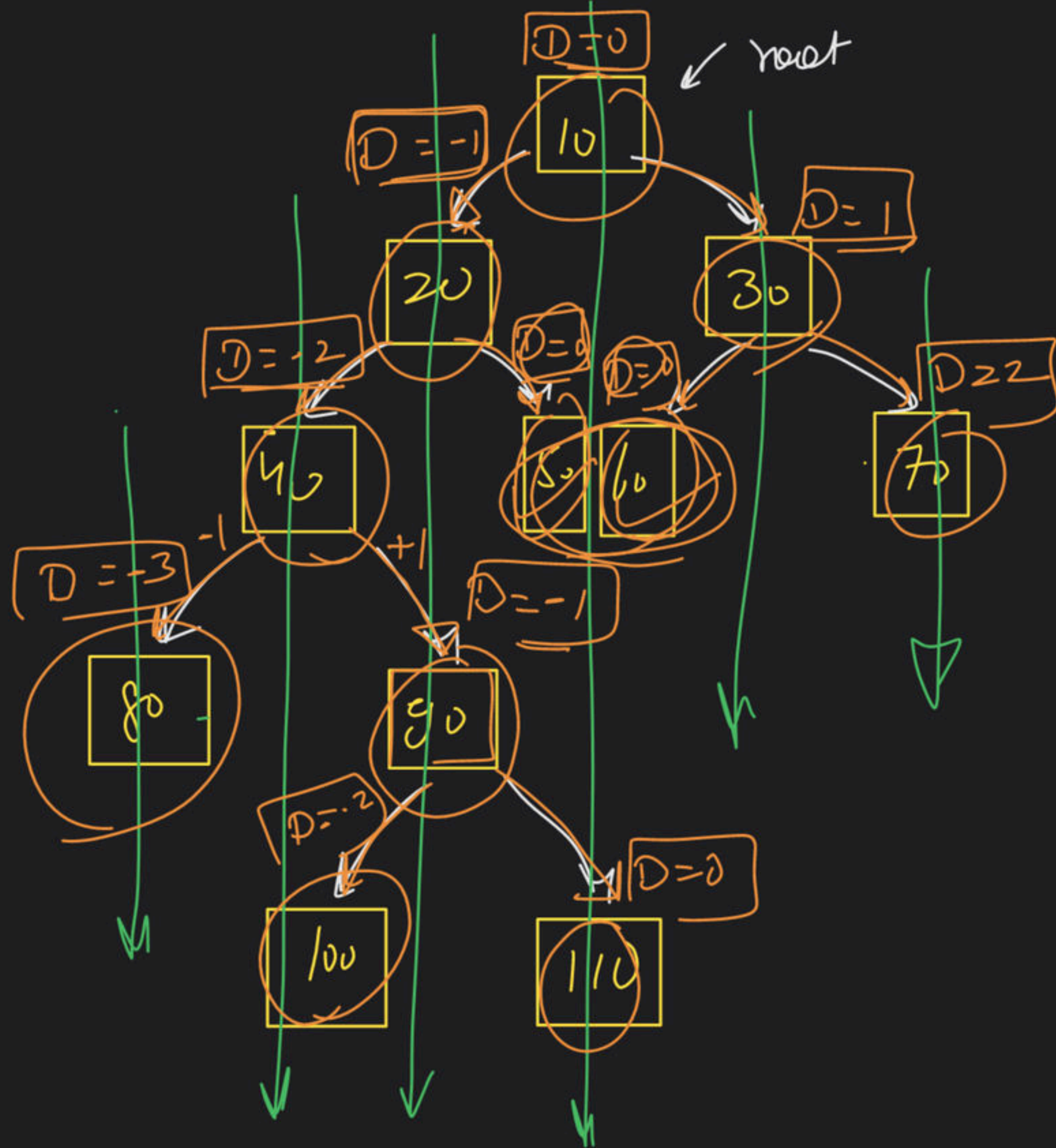
1 min

-1 → 9  
0 → 3 15  
1 → 20  
2 → 7

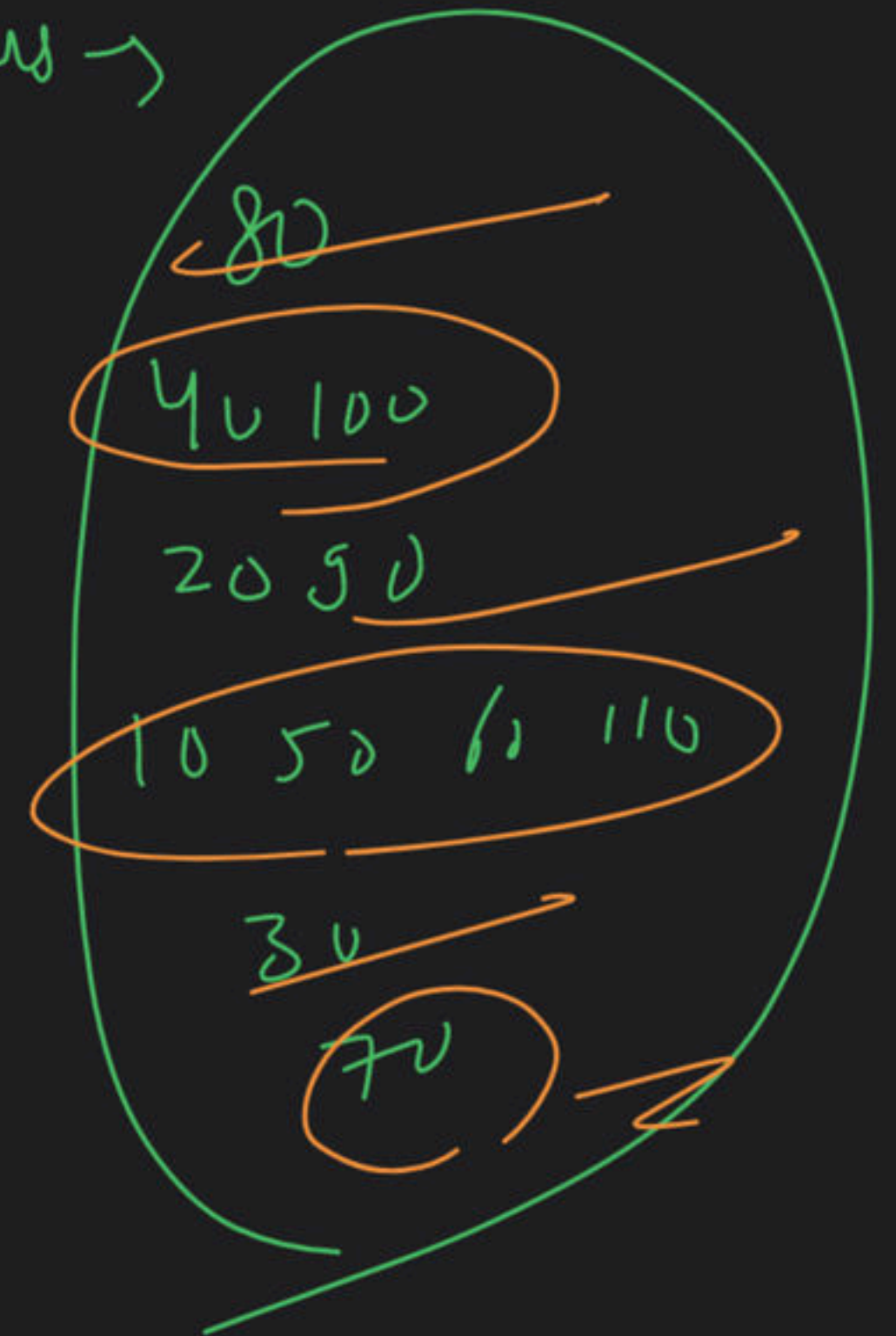




-3  $\rightarrow$  80  
 -2  $\rightarrow$  40, 100  
 -1  $\rightarrow$  20, 70  
 0  $\rightarrow$  10, 50, 60, 110  
 1  $\rightarrow$  30  
 2  $\rightarrow$  70



ans  $\rightarrow$



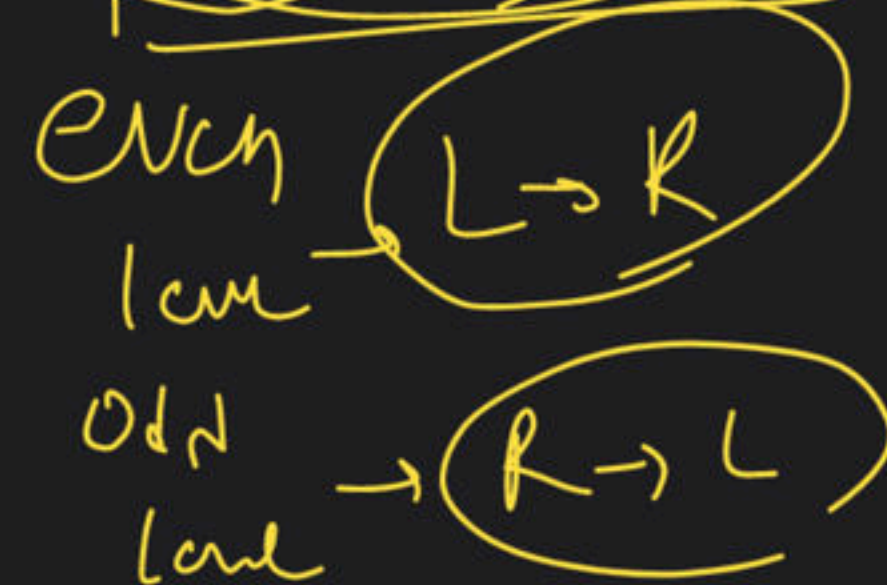
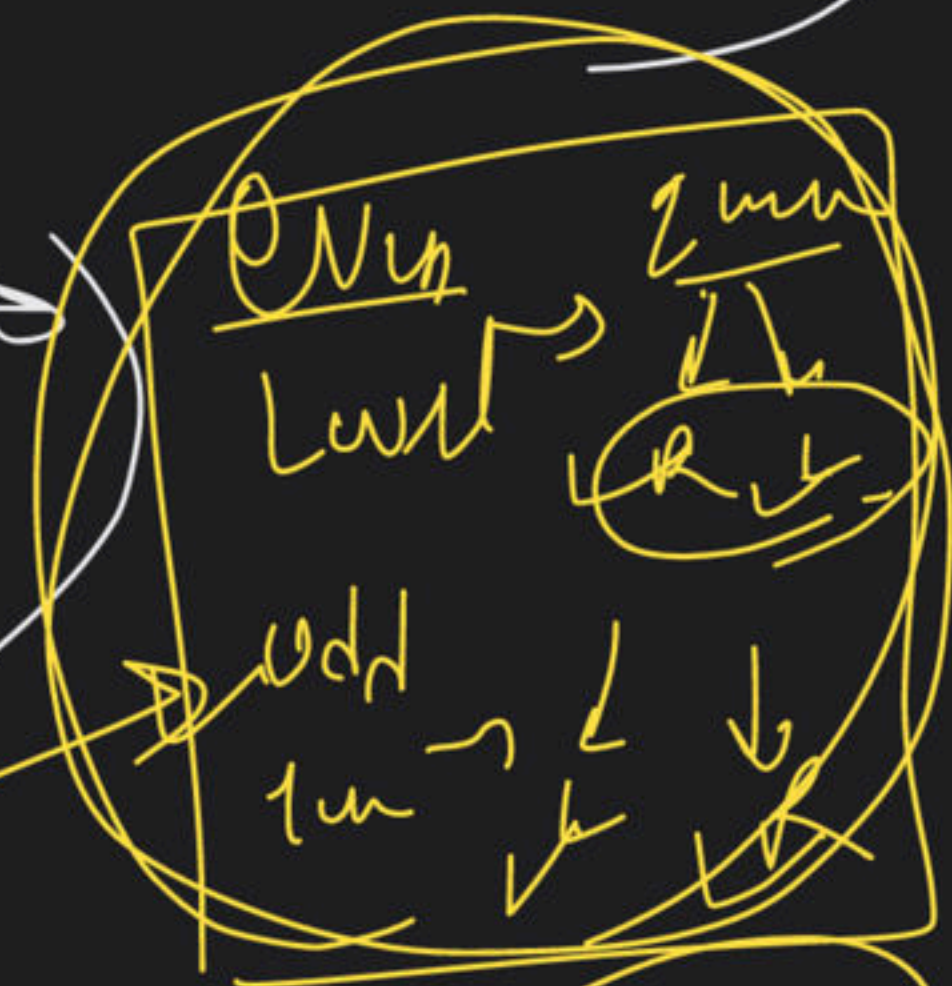
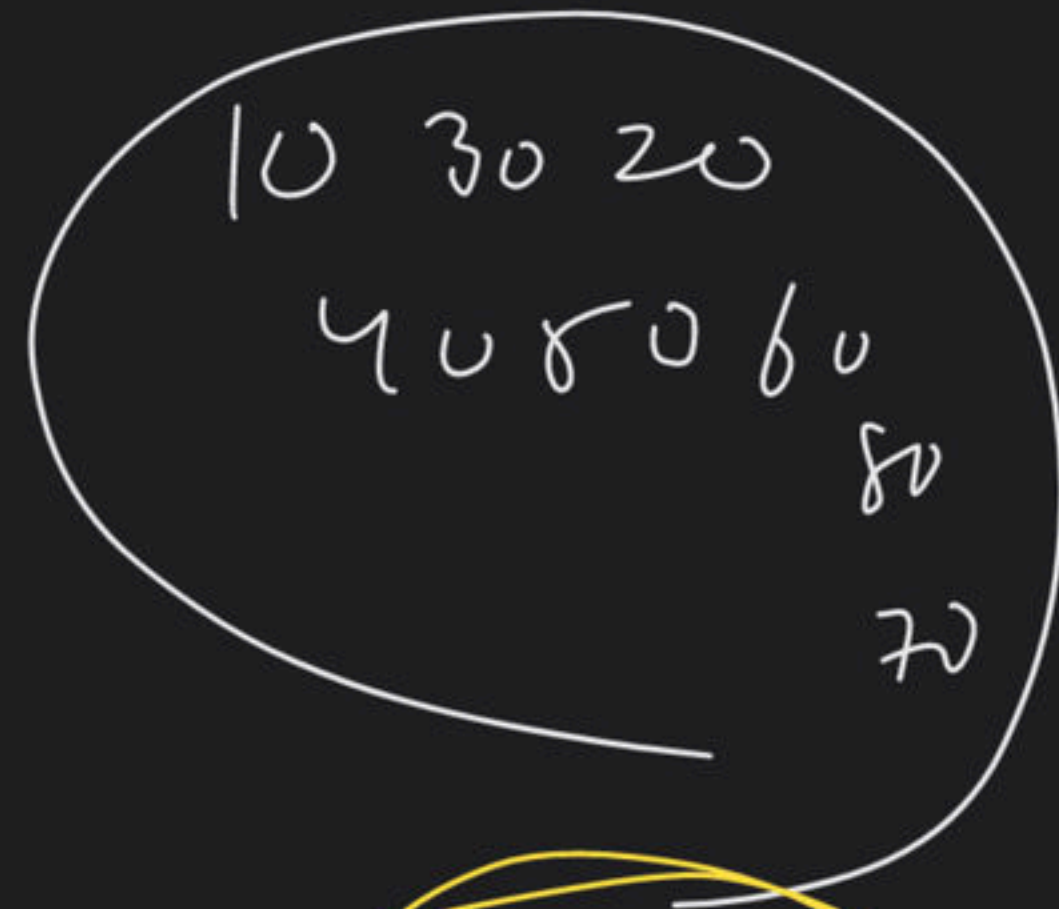
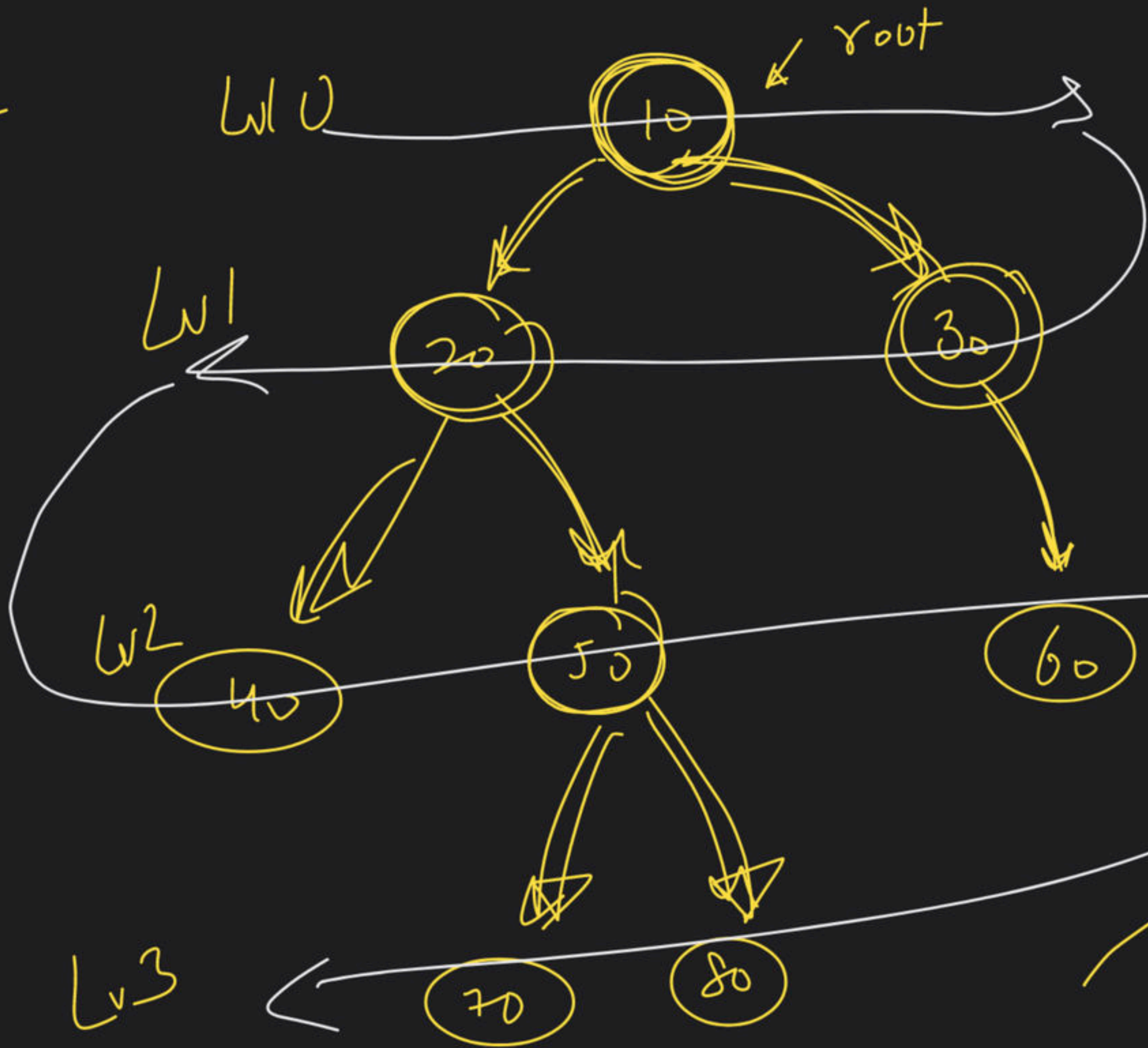


Zig-Zag

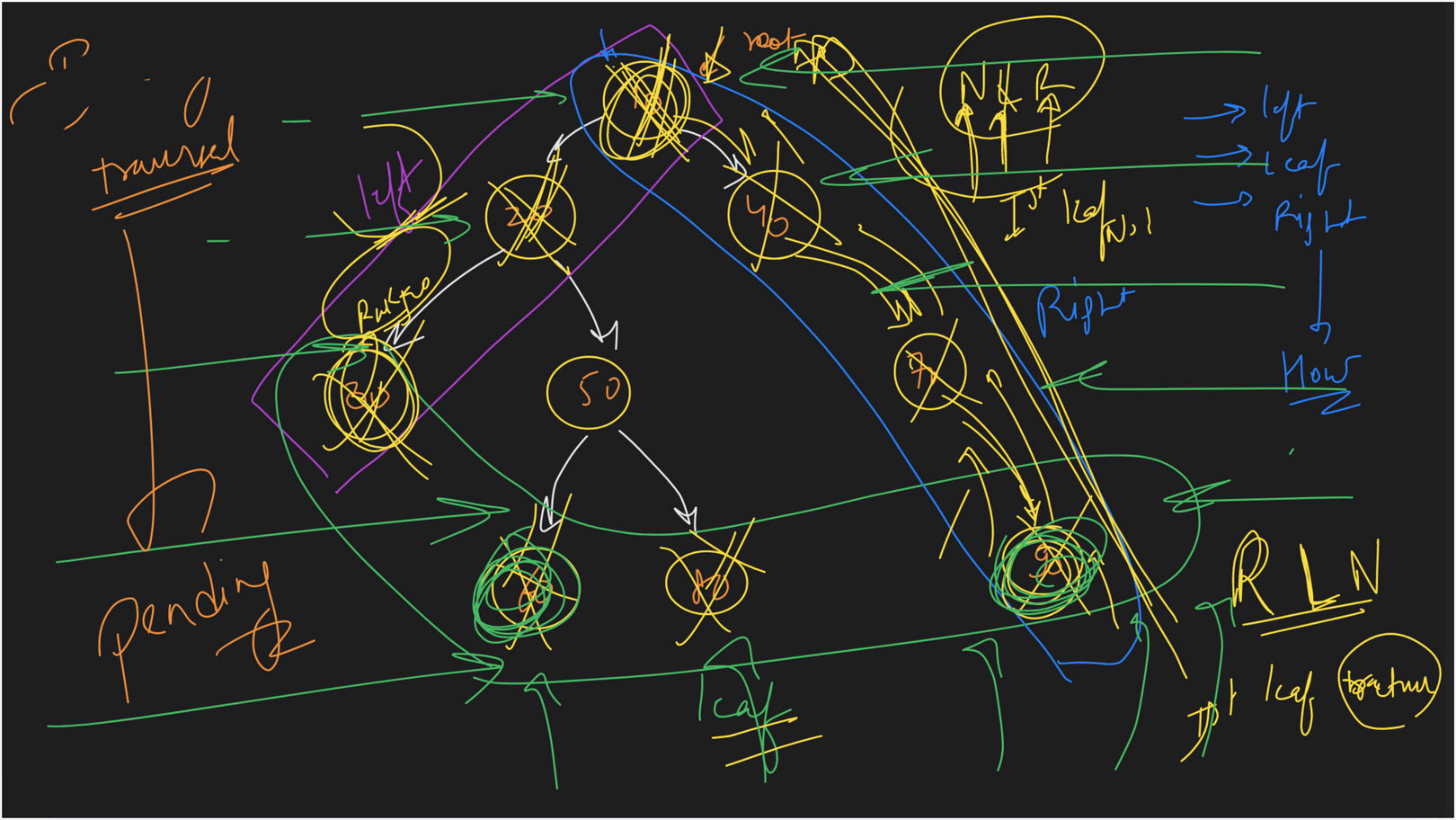
Level Order

Stacks

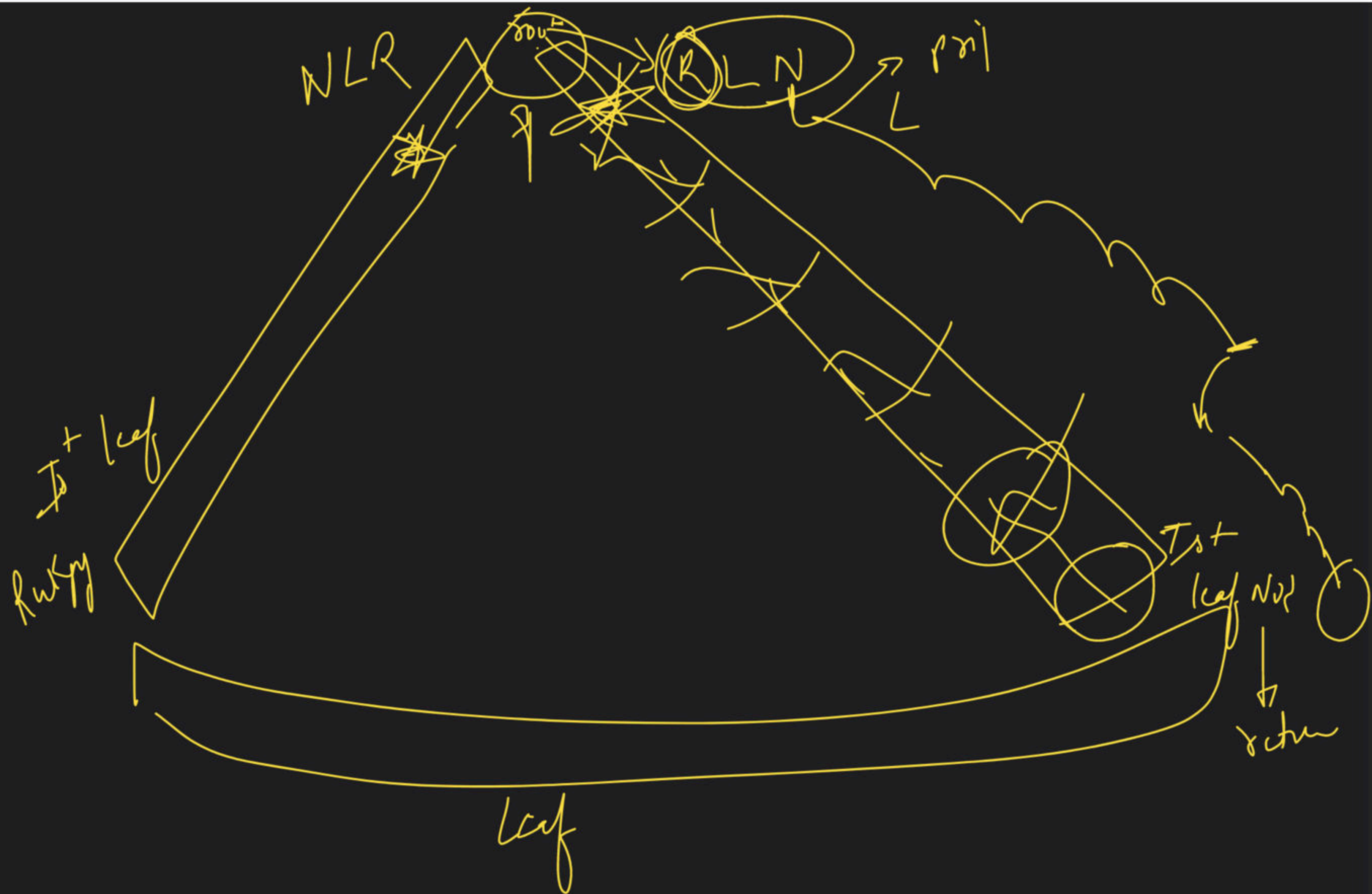
Code













Left View

10 20 70 10

Right View

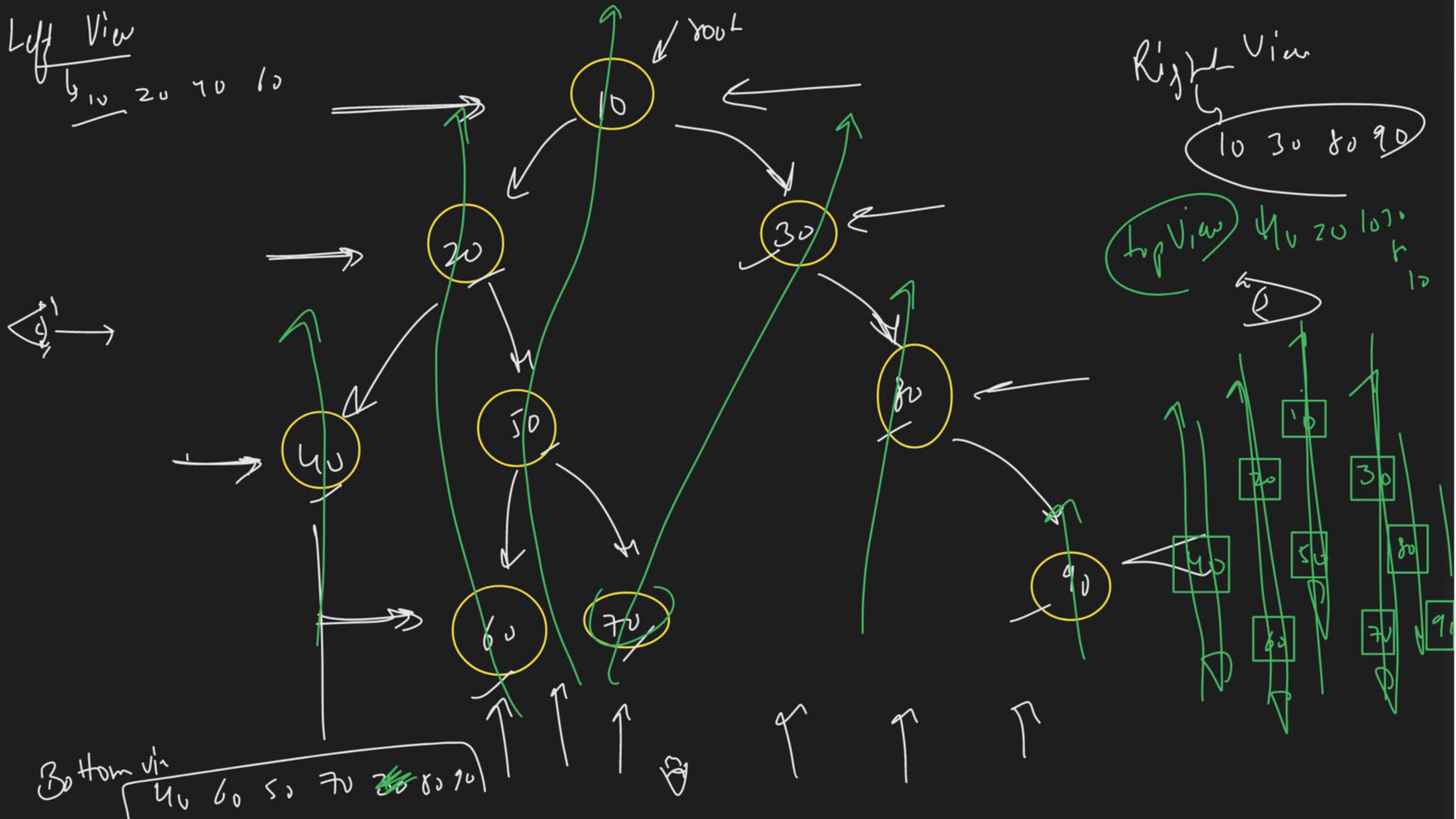
10 30 80 90

Top View

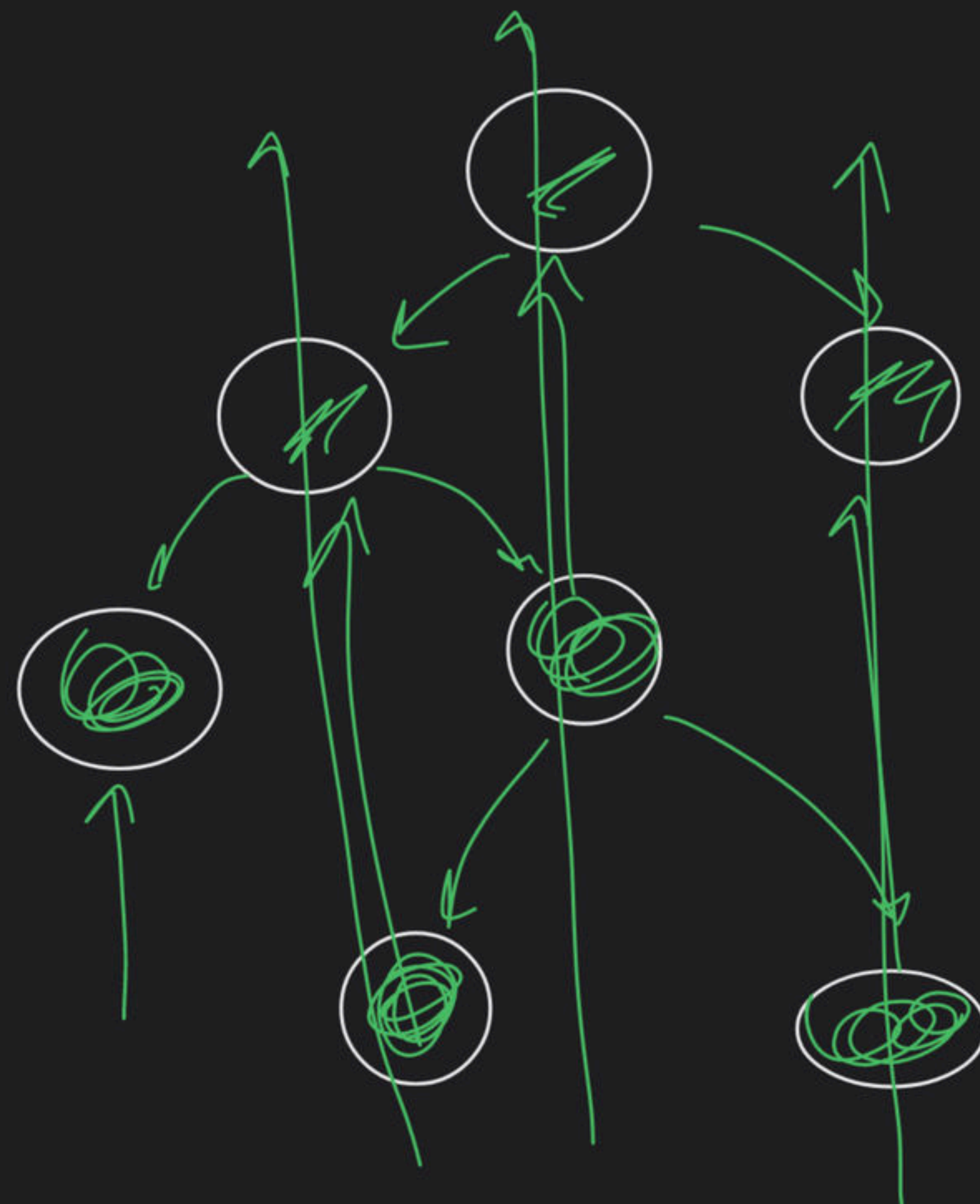
10 20 10 10

Bottom View

40 60 50 70 80 90

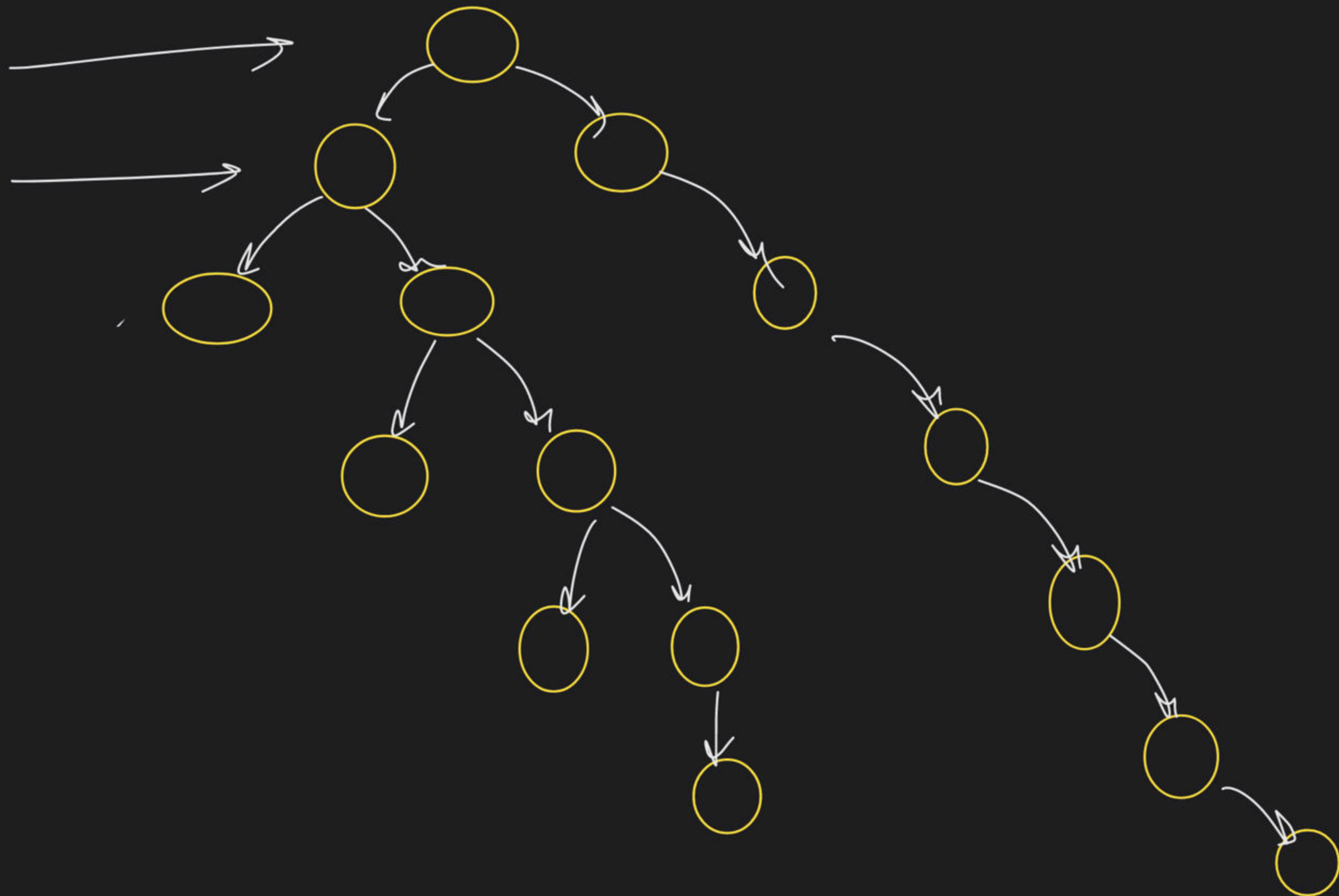




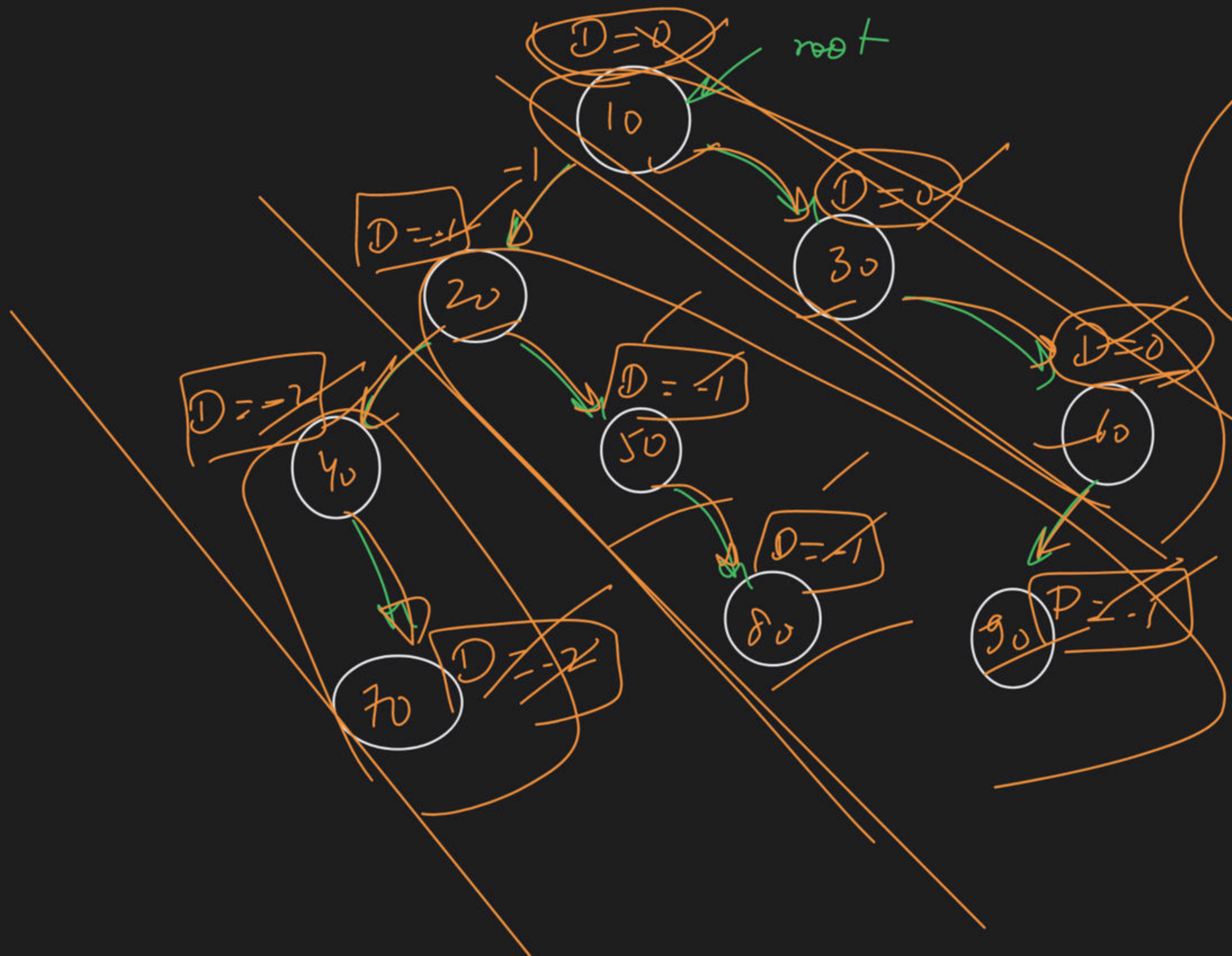


Bottom









10 30 60  
20 50 80 90  
40 70

0 → 10 30 60  
-1 → 20 50 80 90  
-2 → 40 70





















