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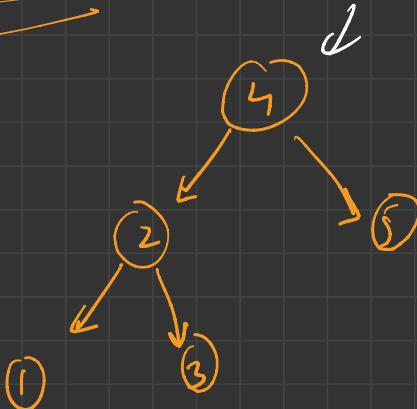
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# Binary Search Trees

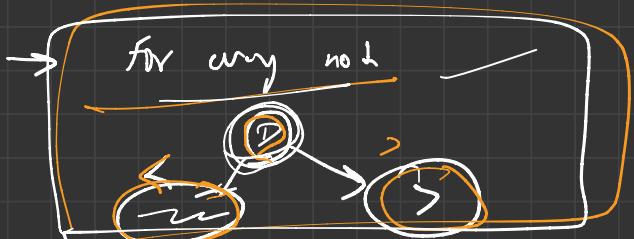
→ Validate BST ..



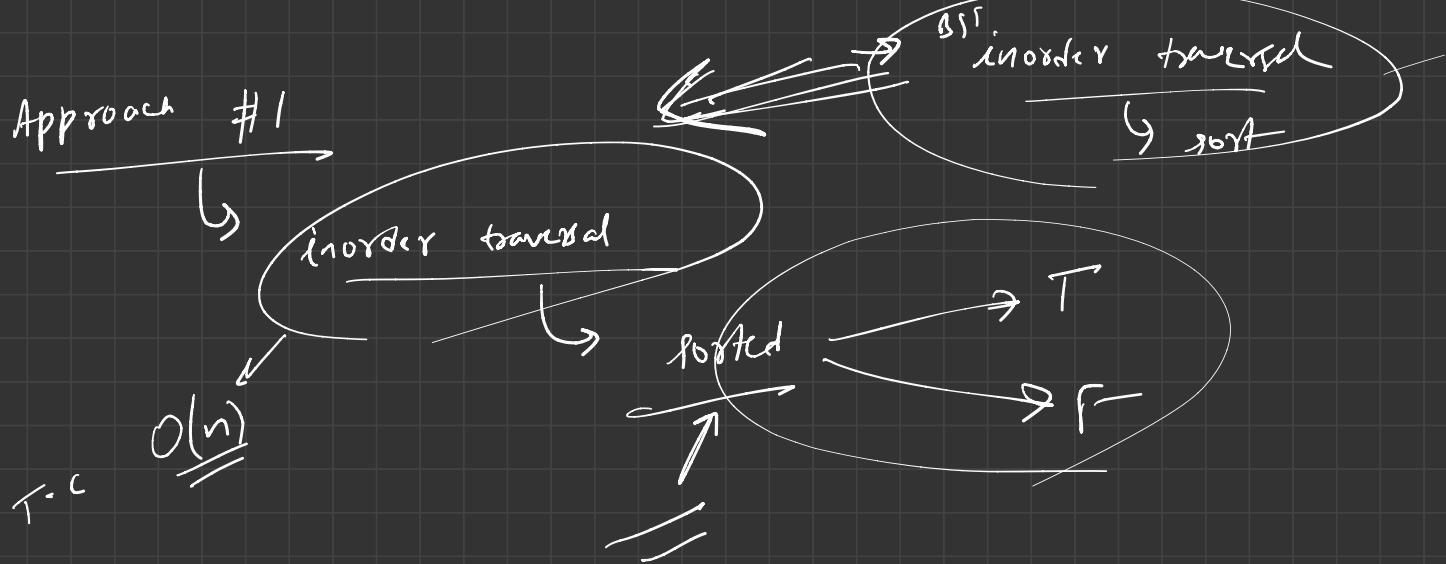
valid BST

T/F

Intuition

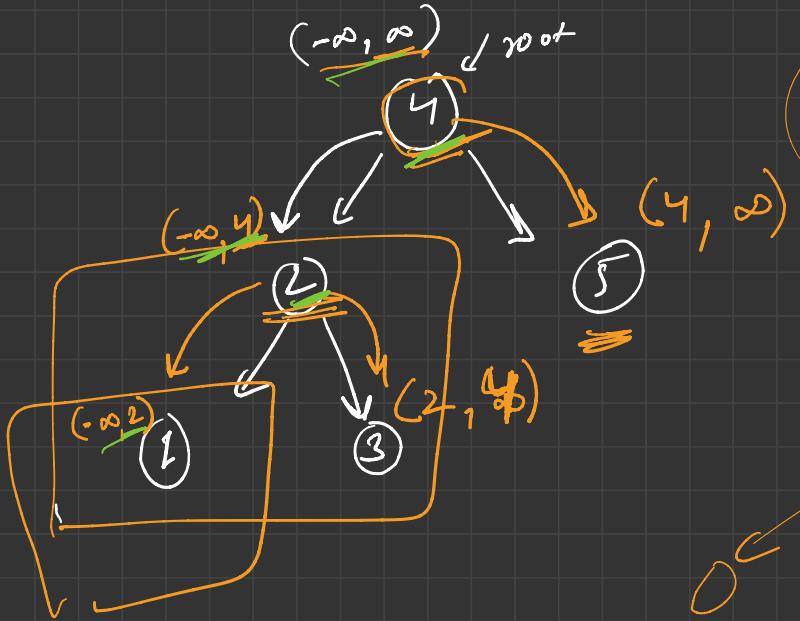


① Approach #1



②

approach #2

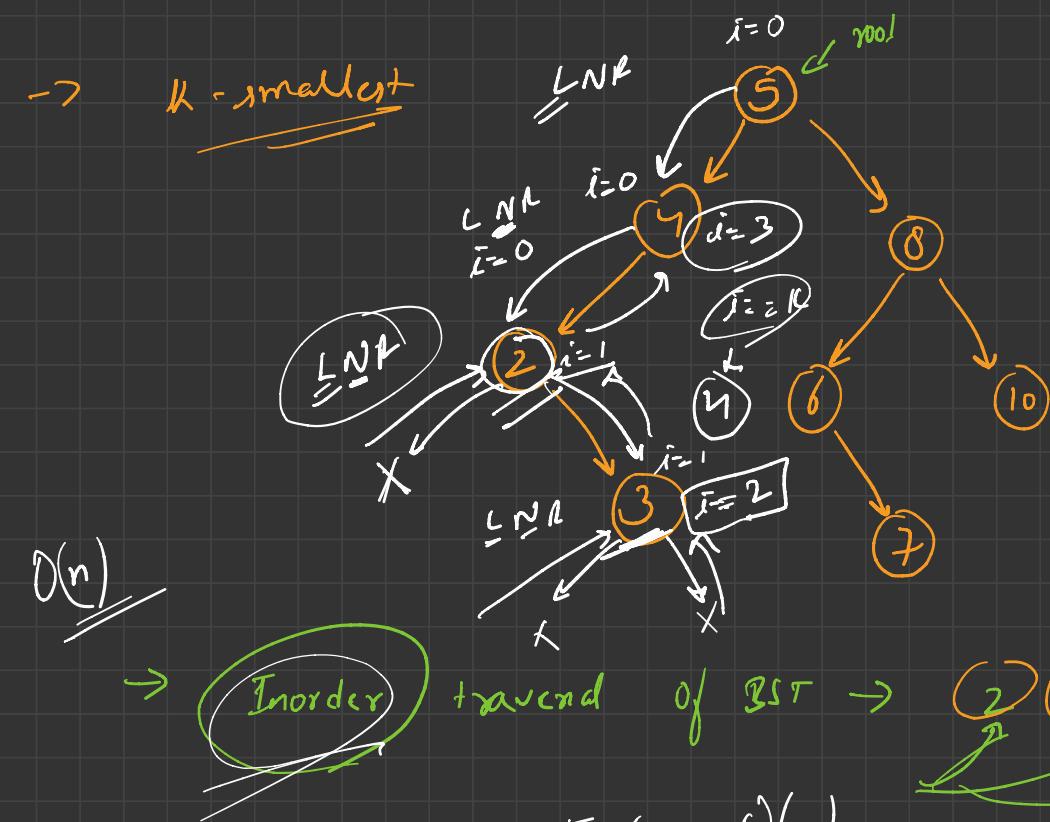


$T \cdot C \rightarrow O(n)$

~~$S \cdot C \rightarrow O(H)$~~

$S \cdot C \rightarrow O(n)$

$\rightarrow \mu = \text{smallest}$



$O(n)$

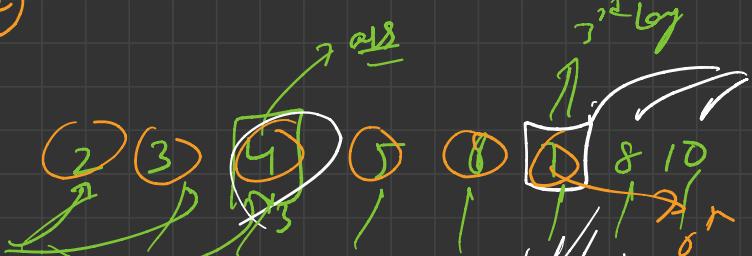


Inorder

+ traversal of BST  $\rightarrow$

$T \leftarrow O(n)$

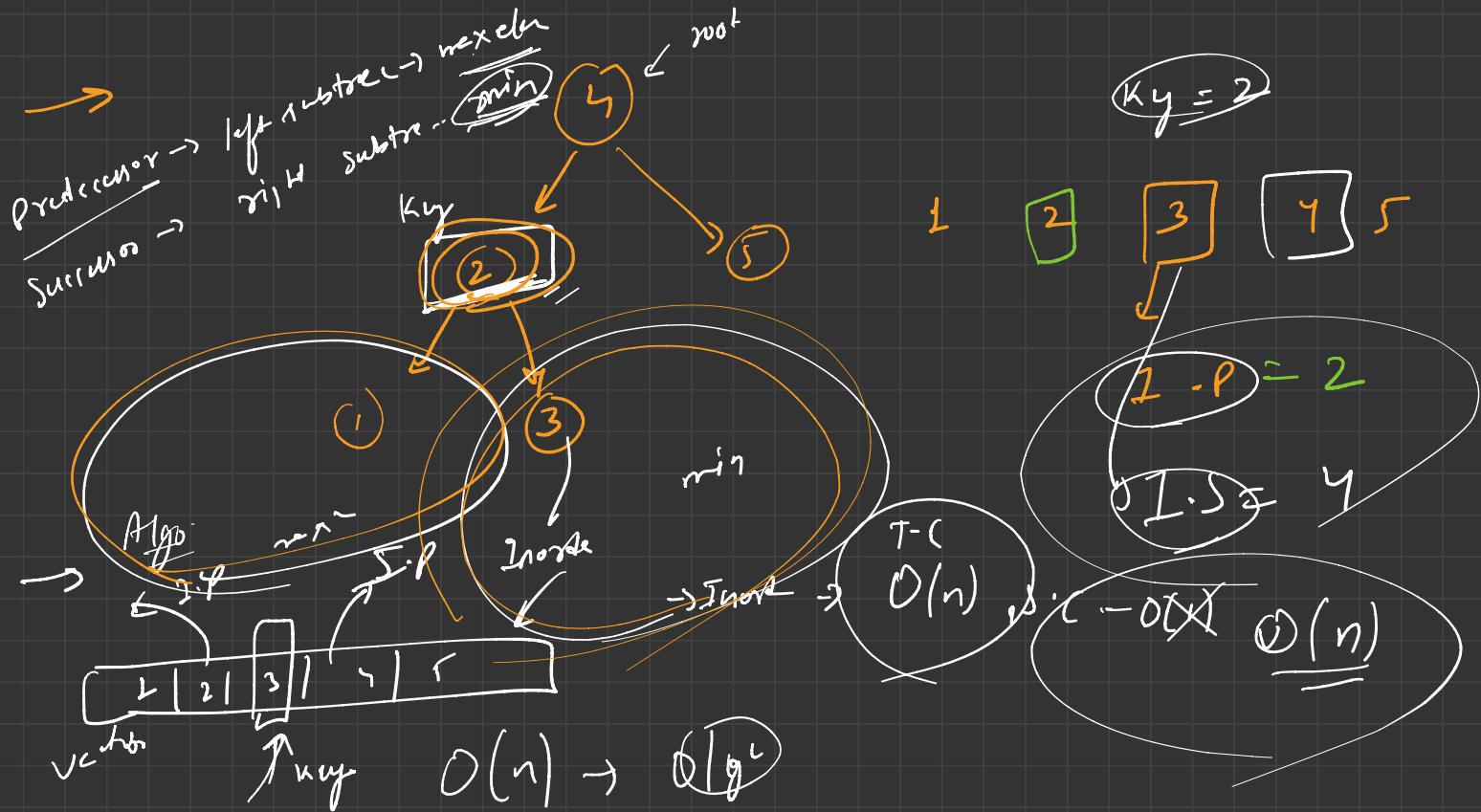
$S \leftarrow O(n)$



Morris traversal  
graph LR  
 $n \rightarrow T \leftarrow O(n)$   
 $S \leftarrow O(n)$

$\rightarrow$

$K$ -Layer  $\rightarrow (n-K) + 1$  node  
 $\rightarrow$   $O(n)$   $\rightarrow O(\lg n)$



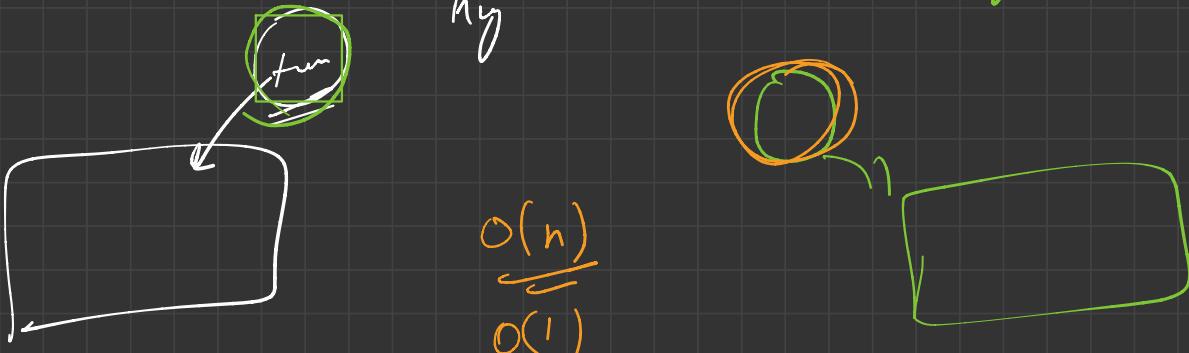
→ Algō #2

$I^+$  → node find (key)  $\rightarrow T.C \rightarrow \underline{\underline{O(n)}}$

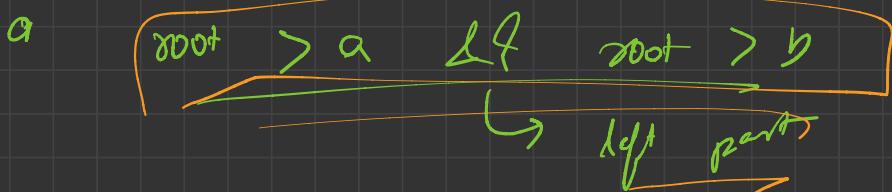
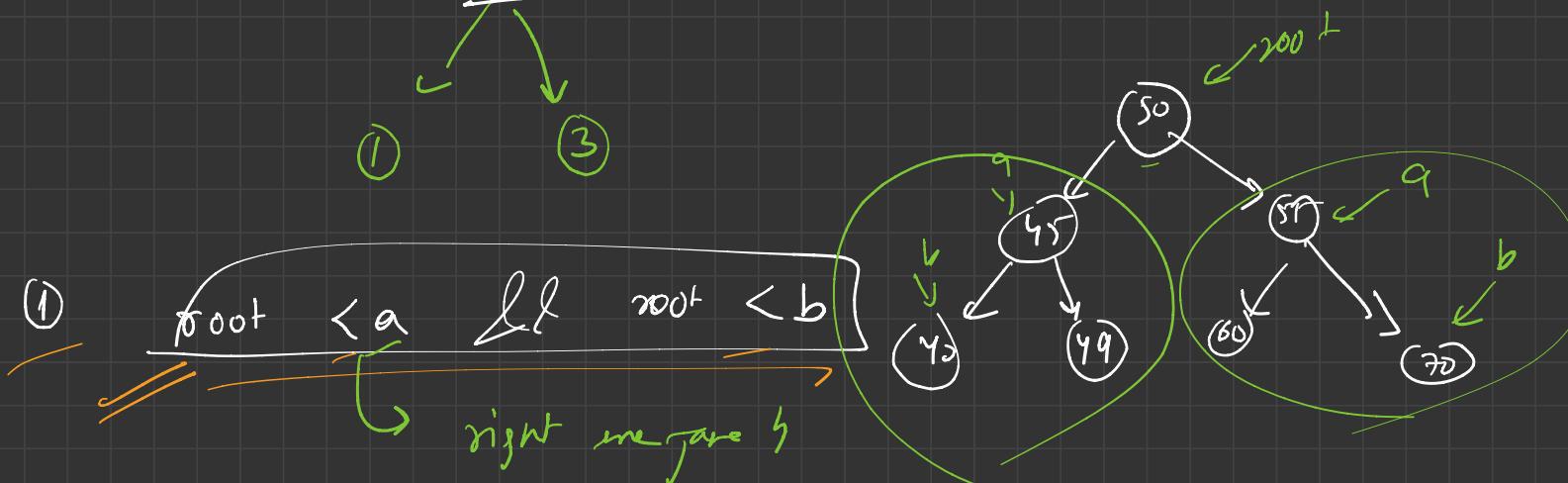
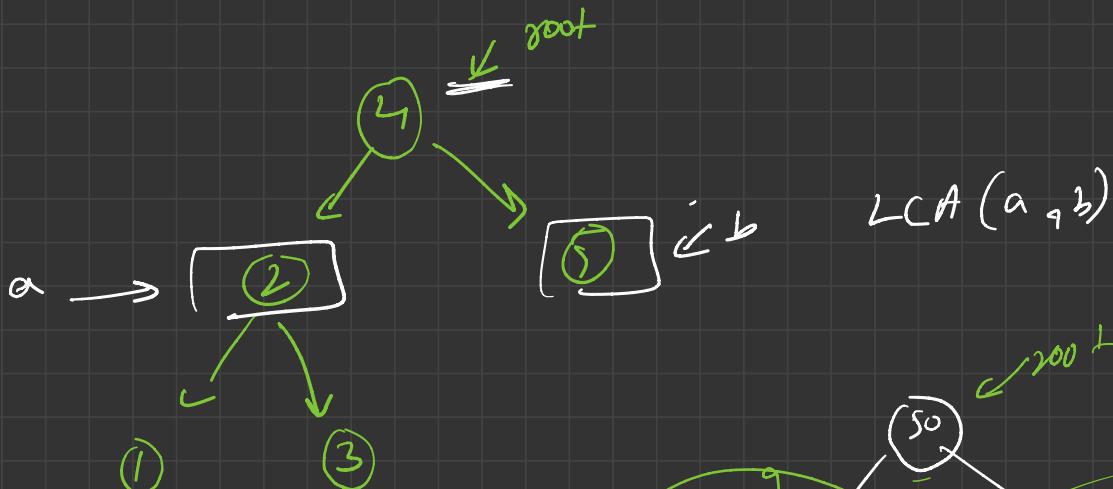
min / next  
pred current

$S.C \rightarrow \underline{\underline{O(1)}}$

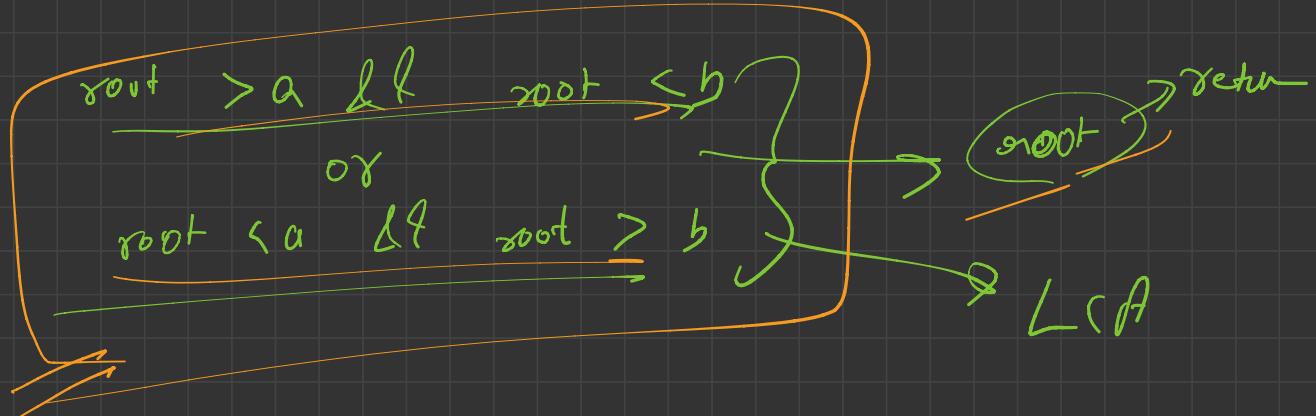
temp → date < key







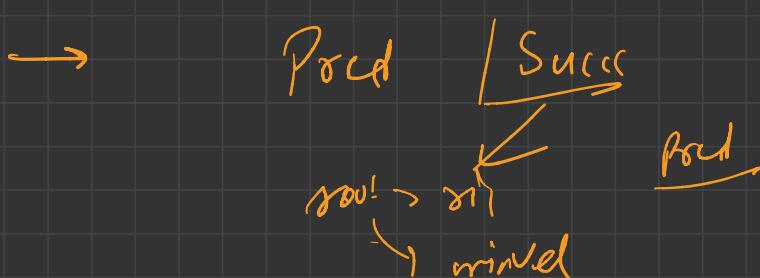
(ii)



→  $K^{\text{th}}$  smaller /  $K^{\text{th}}$  largest

→ invalid  $\text{BST}$

LEFT



$\text{root} \rightarrow \text{left}$   
 $\text{left} \rightarrow \text{max}$   
max value





























