B-tree (Insertion)

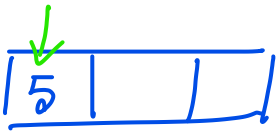
Construct a B-tree of order 4 using the following data values:

5, 3, 21, 9, 1, 13, 2, 7, 10, 12, 4, 8

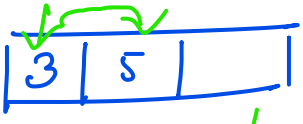
Solution: $m = 4$

∴
- Max no. of keys = $m - 1 = 3$
- Min no. of keys = $\lceil m/2 \rceil - 1 = 1$
- Max no. of children = $m = 4$
- Min no. of children = $\lceil m/2 \rceil = 2$

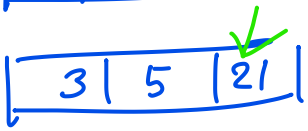
step 1: insert 5



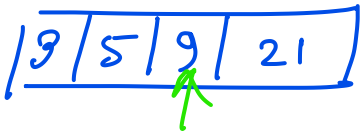
step 2: insert 3



step 3: insert 21

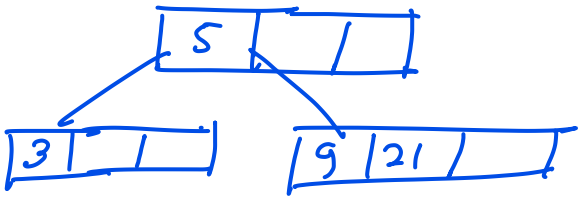


step 4: insert 9 (First insert then split)

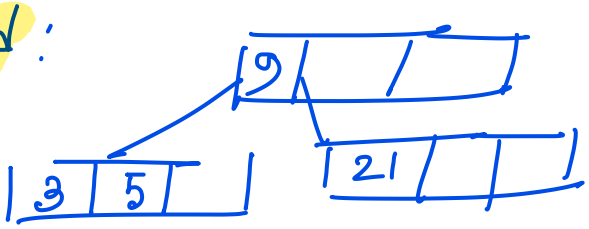


Now you can split the tree either by Left Biased or by Right Biased mechanism.

If **left biased**:

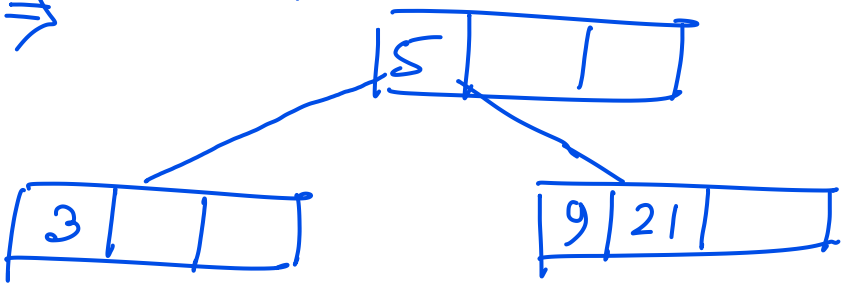


If **right biased**:

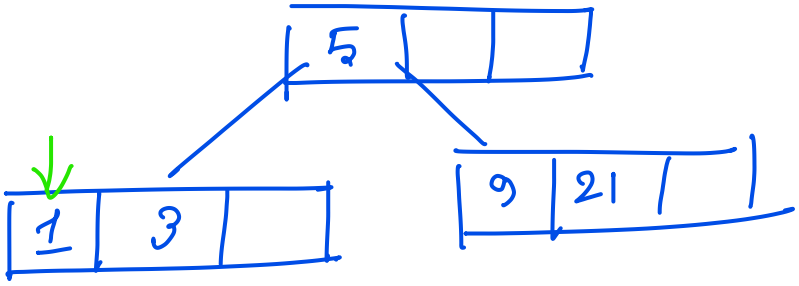


We are going with leftbiased

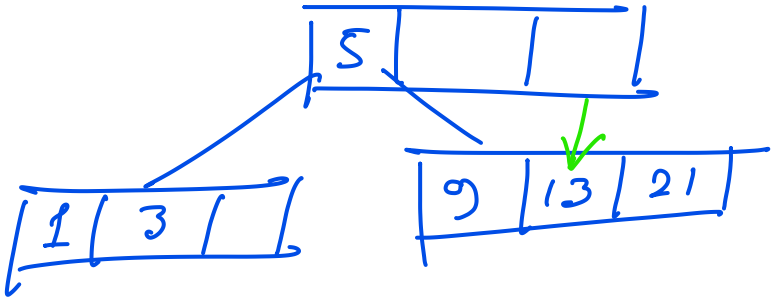
⇒



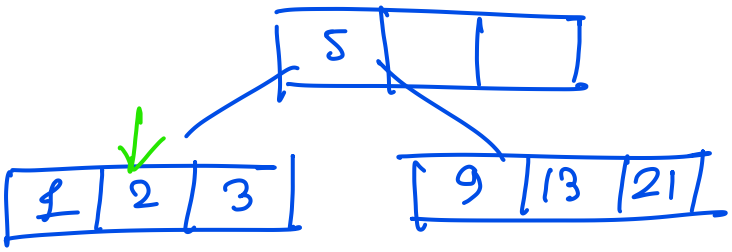
Step 5: Insert 1



Step 6: Insert 13

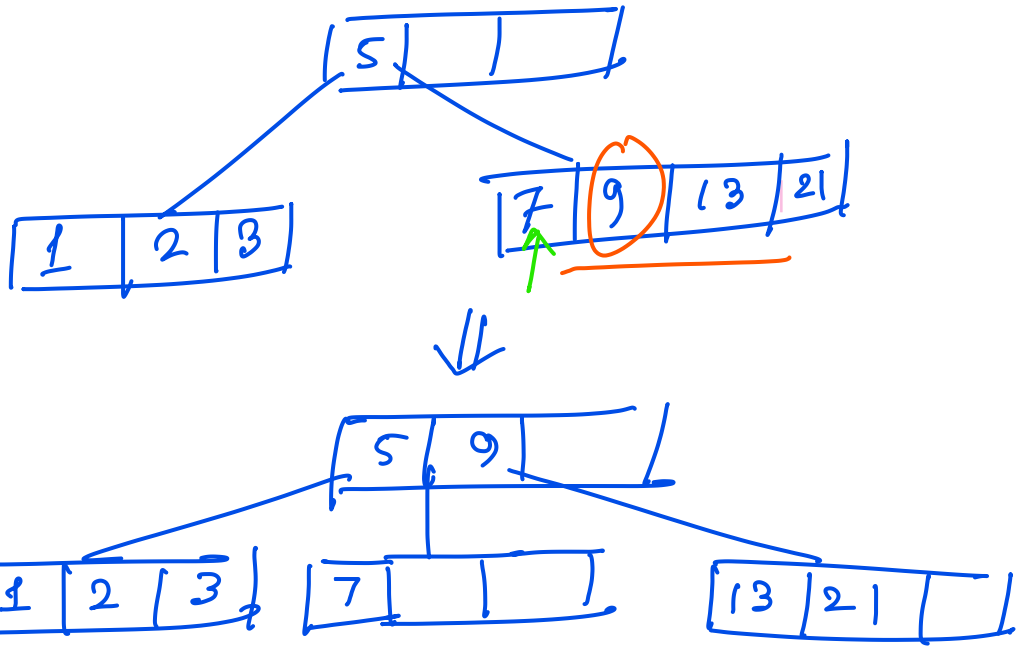


Step 7: Insert 2

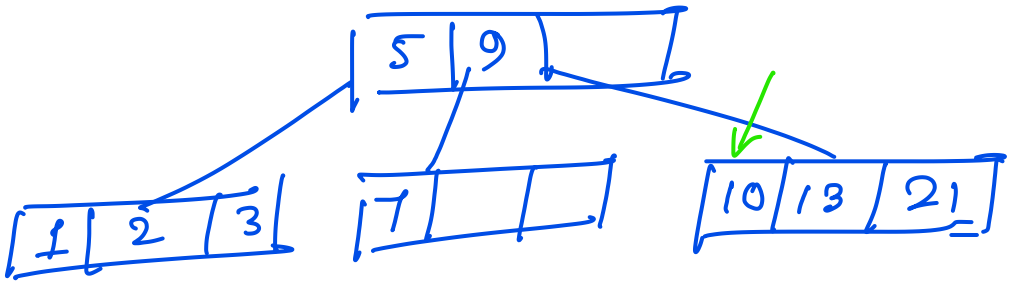


Step 8: Insert 7

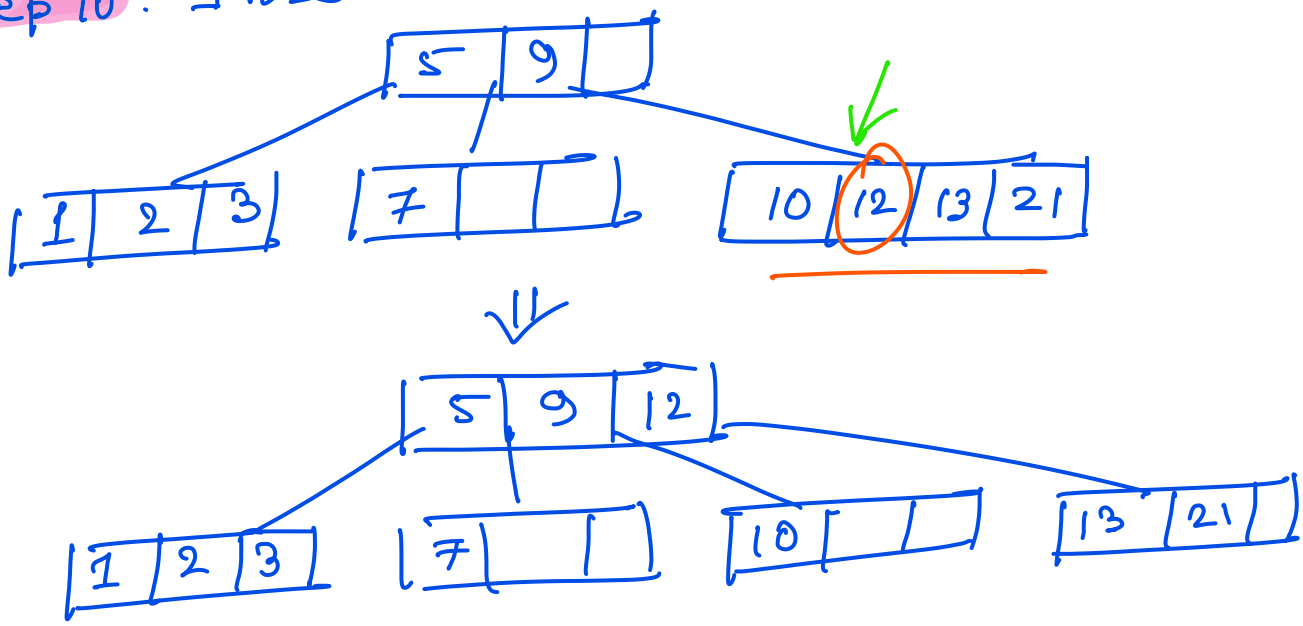
P.T.O



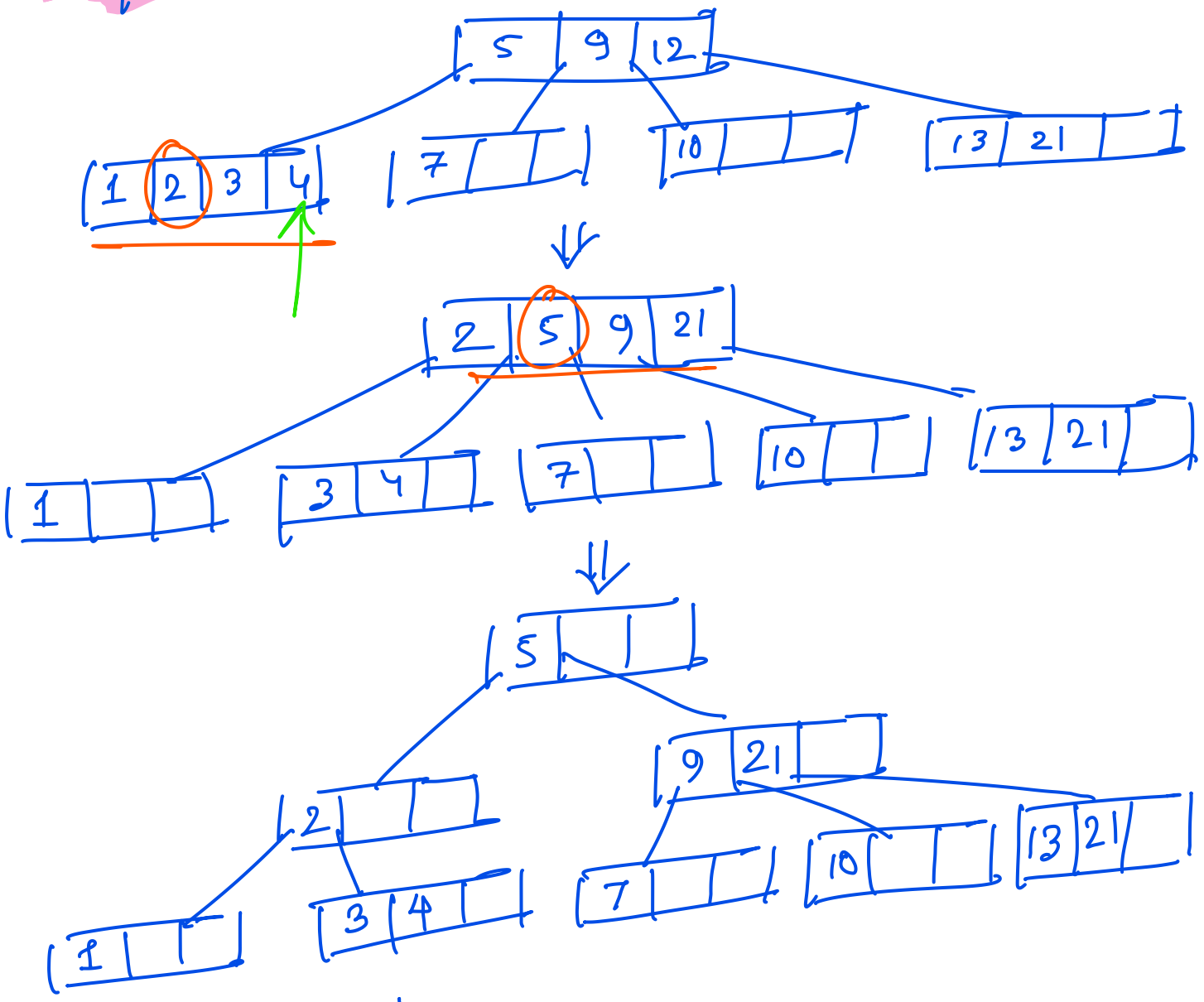
Step 9: Insert 10



Step 10: Insert 12



Step 11: Insert 4



Step 12: Insert 8