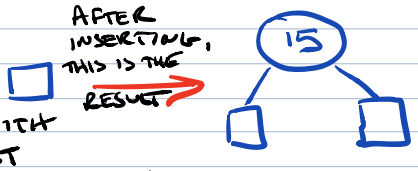
EXAMPLE OF INSERTING & REMOVING TO/FROM A BINARY SEARCH TREE

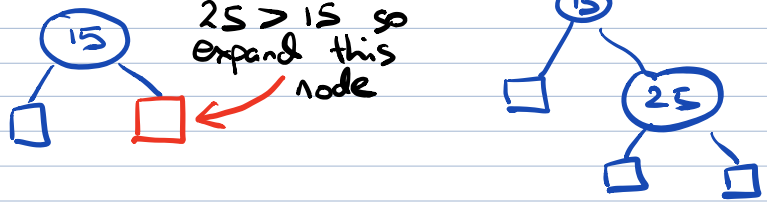
FROM LECTURE WEEK 3

INSERT 15

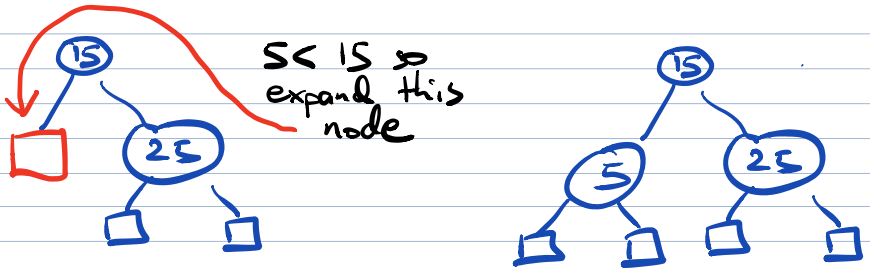


BEGIN WITH EMPTY BST (ONE EXTERNAL NODE)

INSERT 25

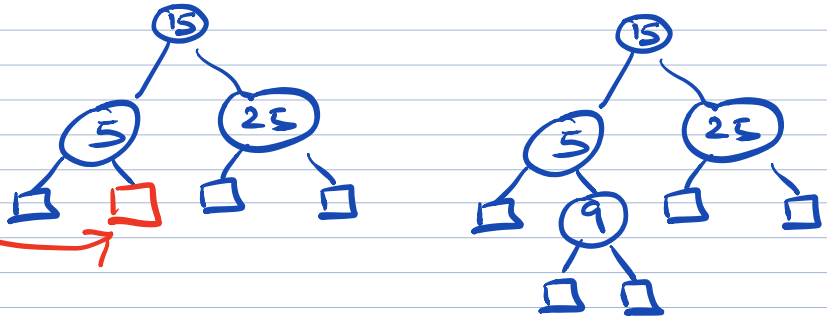


INSERT 5

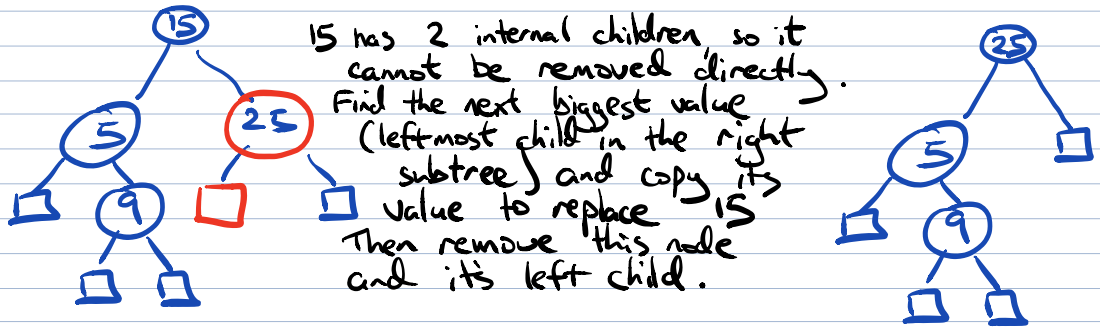


INSERT 9

9 < 15 so go left
9 > 5 so expand this node



REMOVE 15

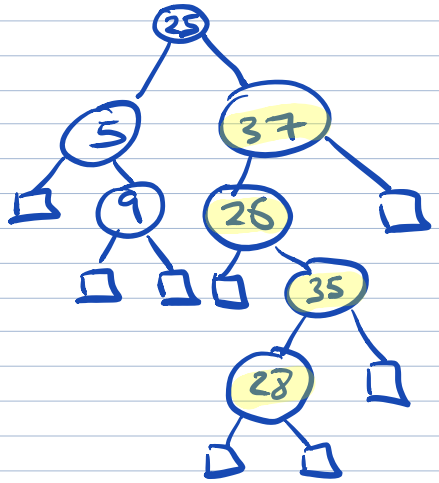


INSERT 37

INSERT 26

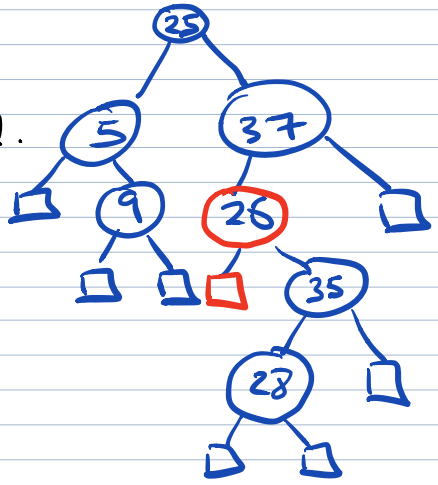
INSERT 35

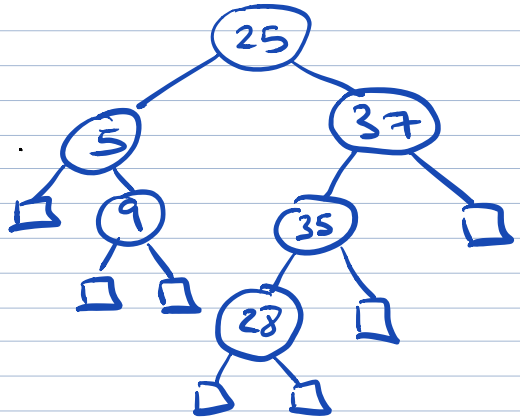
INSERT 28



REMOVE 26

26 has an external child. Remove directly (no need to swap).





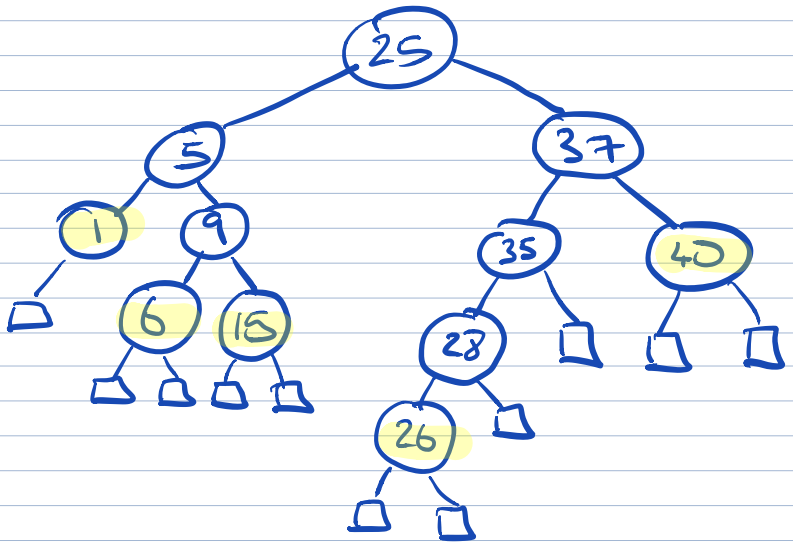
INSERT 40

INSERT 1

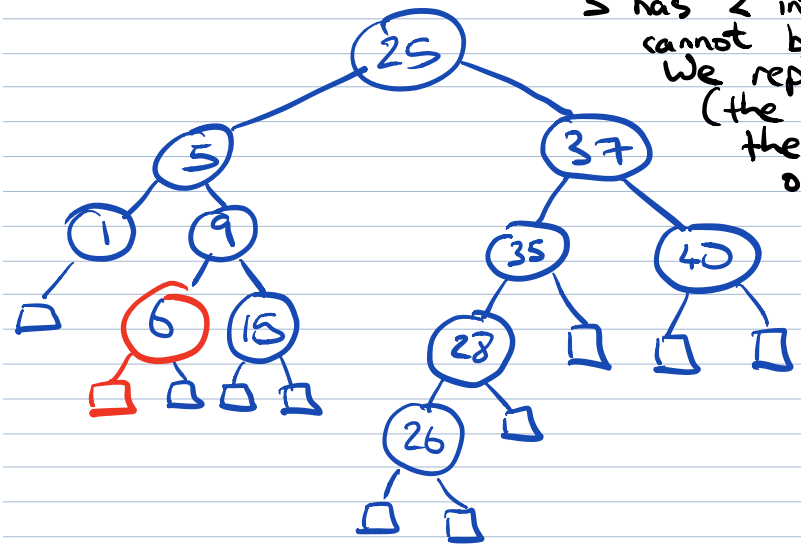
INSERT 15

INSERT 26

INSERT 6



REMOVE 5



5 has 2 internal children so cannot be removed directly. We replace 5 with 6 (the next biggest value) then remove the node of 6 and its left child).

FINAL TREE