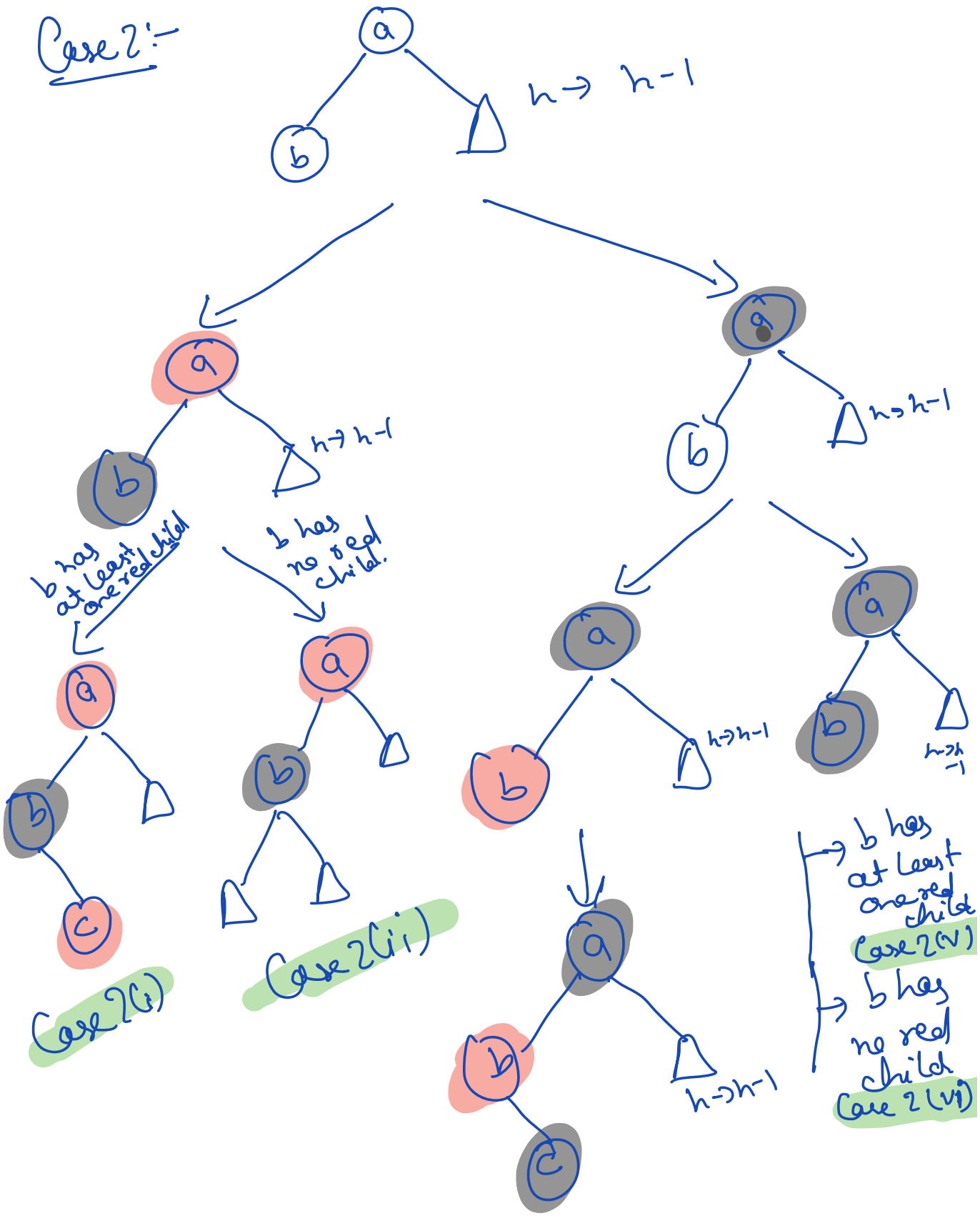
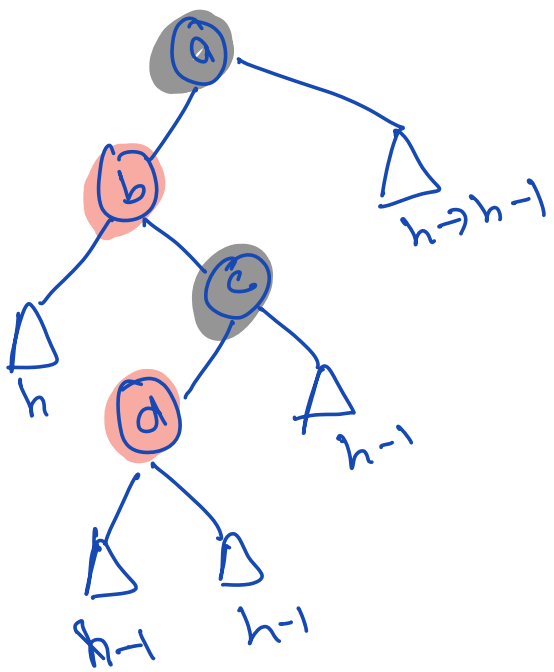

Case 2:-
a
b
h → h-1
a
b
h → h-1
b has at least one red child
b has no red child.
a
b
c
Case 2(i)
a
b
Case 2(ii)
a
b
h → h-1
a
b
h → h-1
h → h-1
a
b
c
h → h-1
b has at least one red child
Case 2(v)
b has no red child
Case 2 (vi)

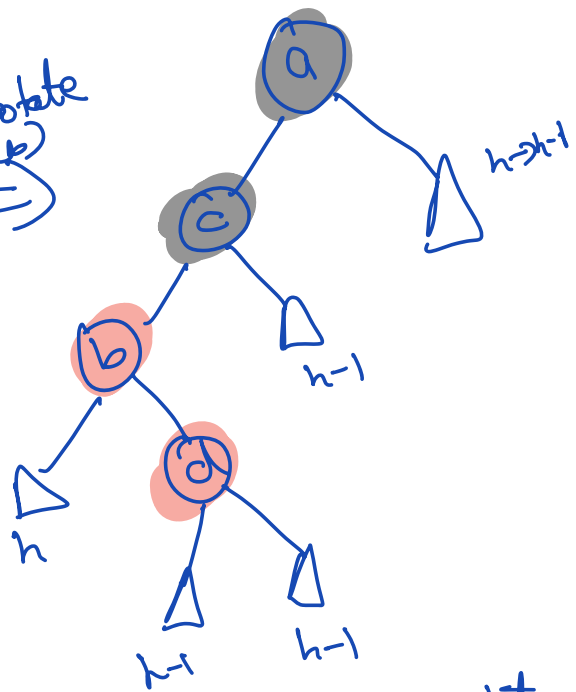
c has at least one red child → Case 2(iii)

c has no red child → Case 2(iv)

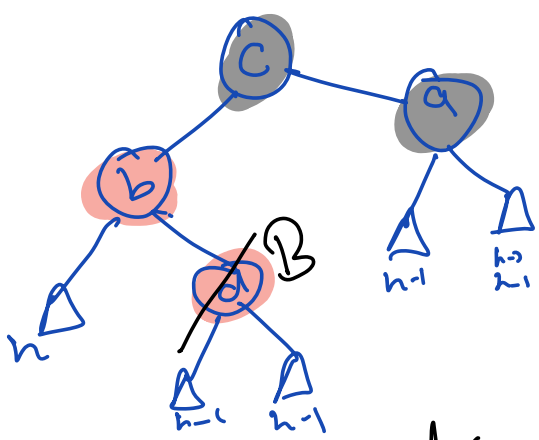
Case 2(iii). A



left_rotate (b)

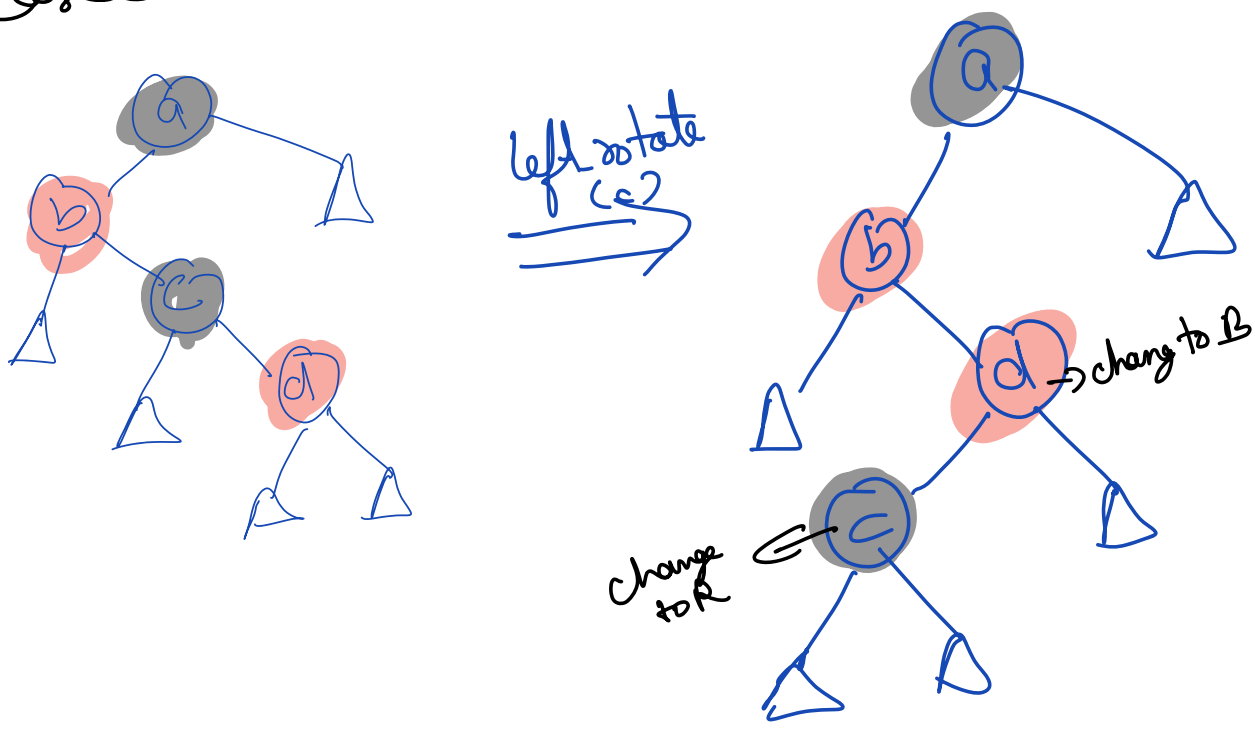


right_rotate (a)

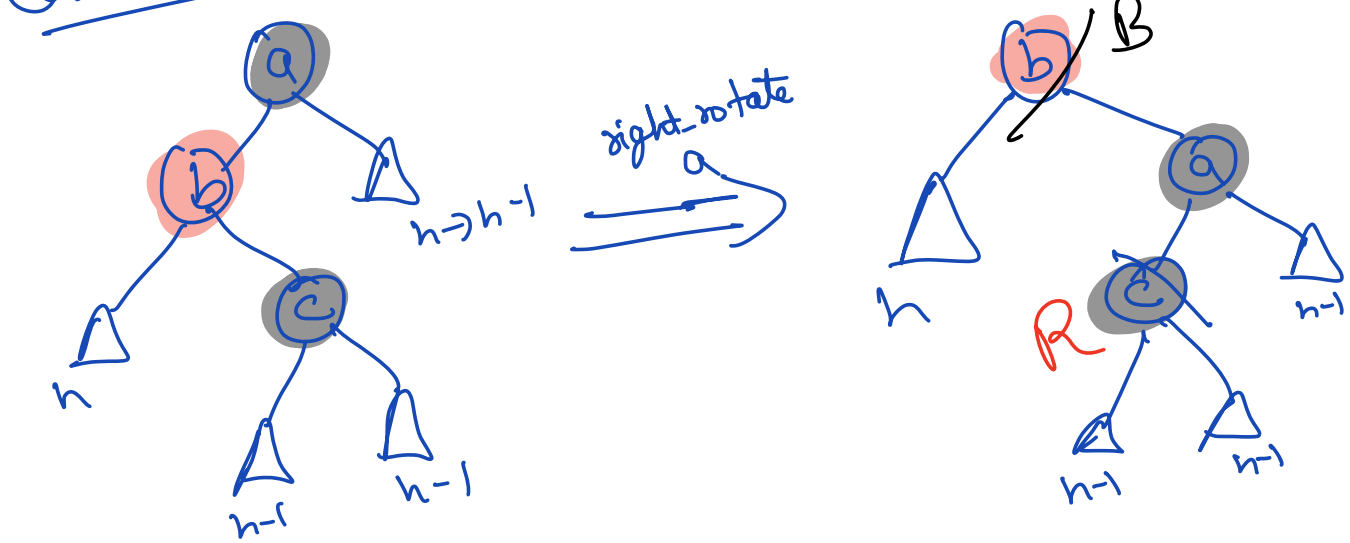


change the color of d to B.

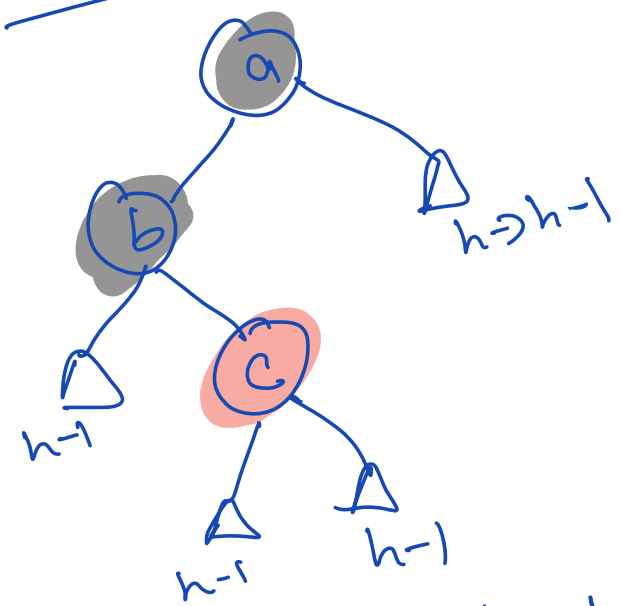
Case 2(iii).B



Case 2(iv)



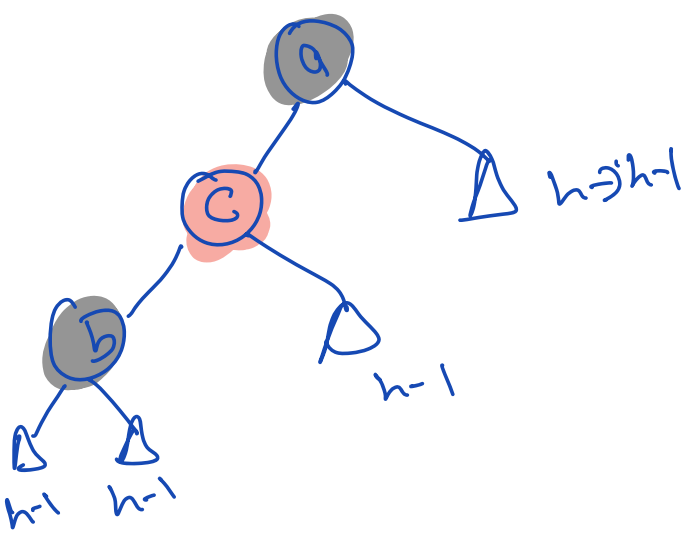
Case 2(v)



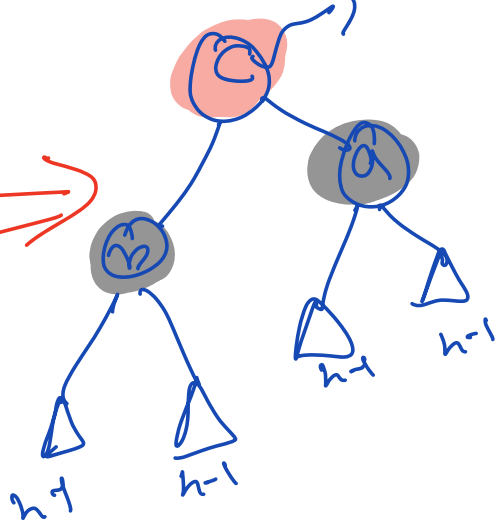
right_rotate (a)

check on your own if it works!

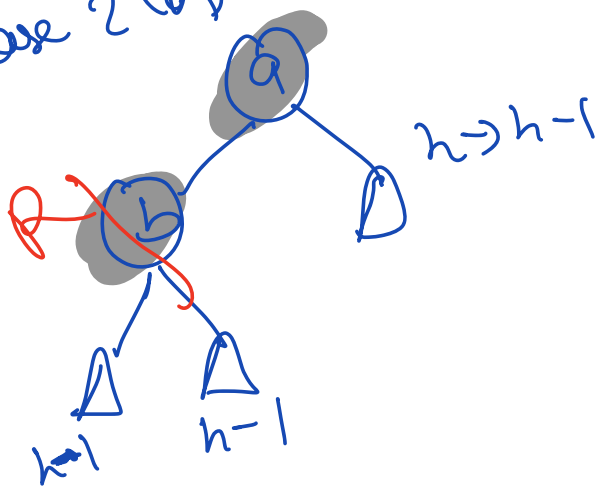
left_rotate (b)



change to B



Case 2 (vi)



$\Rightarrow$ height of this subtree decrease by 1.

Deletions takes $O(\log n)$ time.