CSE 222 Final Examination

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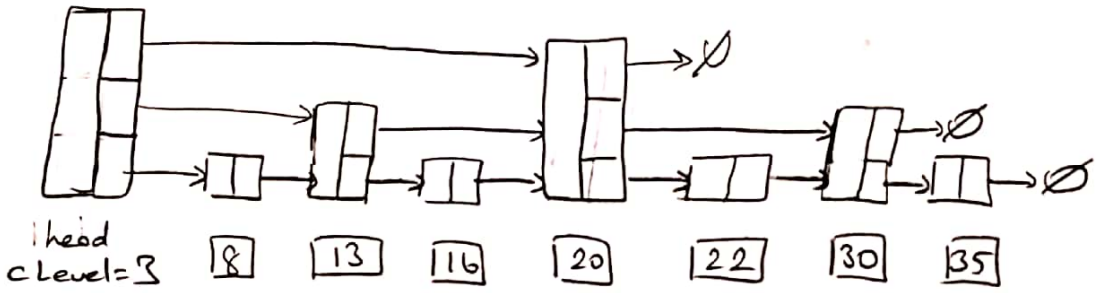
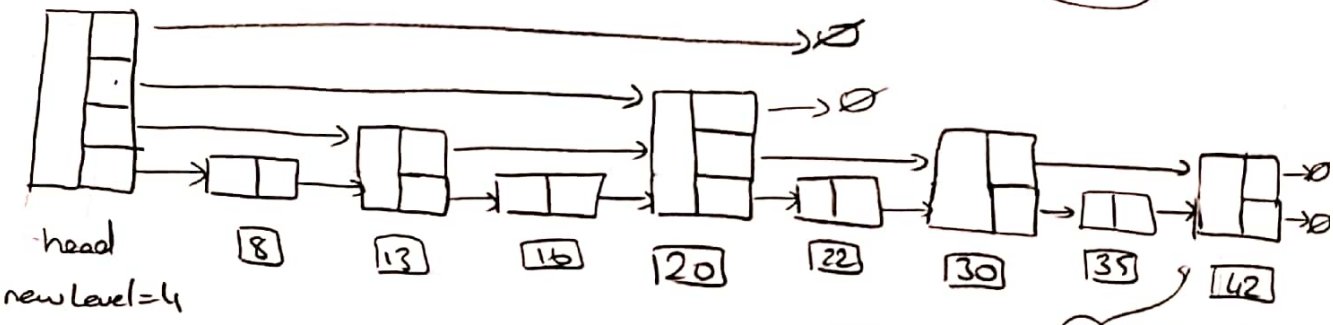
a) When we want to some operation in O(log n) time we need to keep a balance between maxLevel and maxCap. if our level is 3 then our linked list max cap maxCap <= $2^{maxL} - 1$ so $2^3 - 1 = 7$ for level 3 we can keep max 7 element after the another insertion we need to increase our level

a)

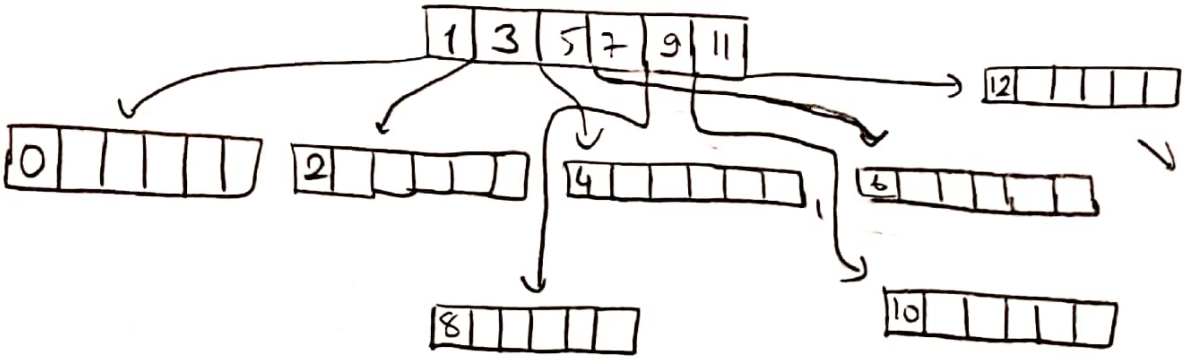


lets insert (42) => #of element = 8 $8 < 2^L - 1$ (L=4)

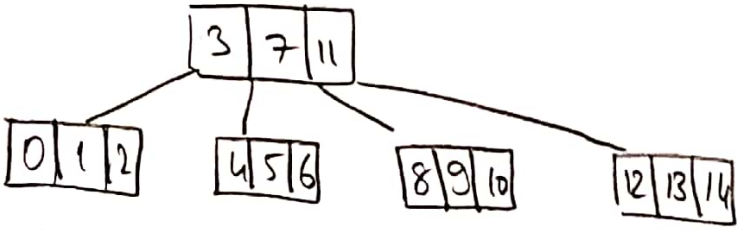


newL = 1 (%50), 2 (%25), 3 (%12,5), 4 (%6,25)

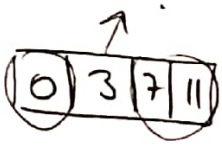
b)

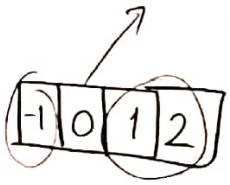


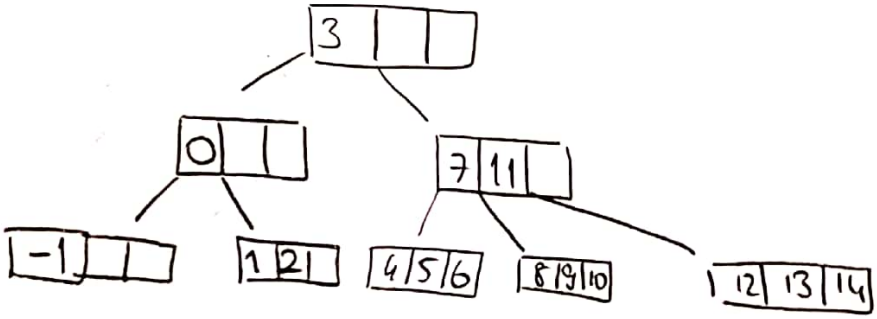
c)



insert (-1)







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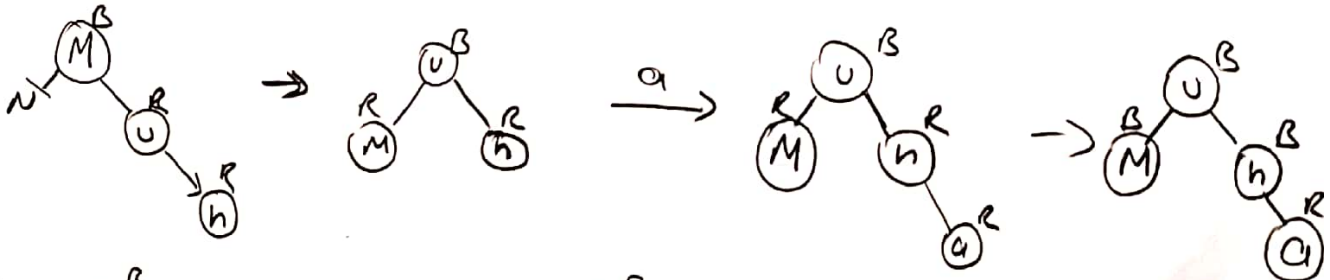
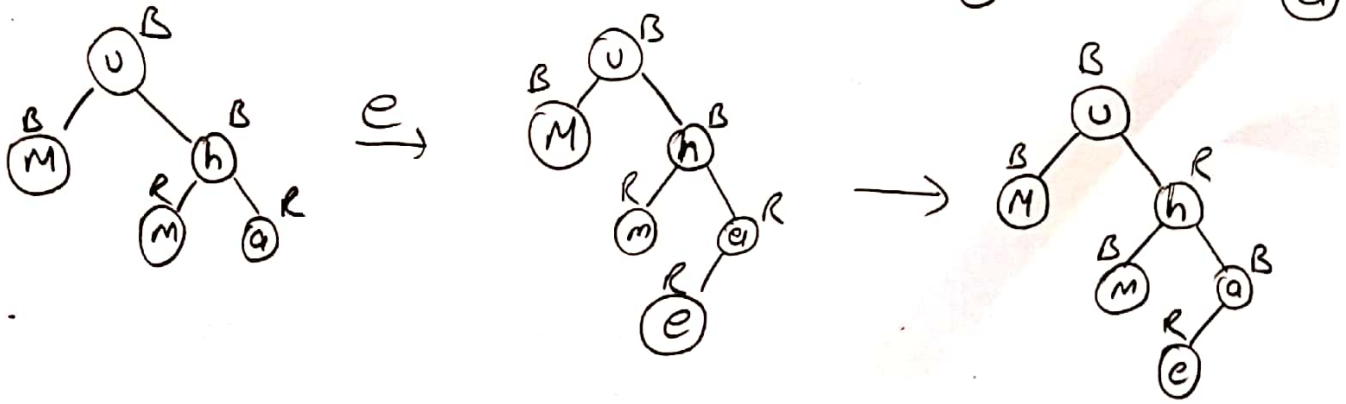
d) Muhame lower > upper

a > e > h > m > u > M

M, u, h →



m →



e) -> in the located leaf to root path because each node balance are connected with the children node. if children has lost its balance root will be affected this situation.

- It is located one upper level

→ It is effecting like a domino if you fix child