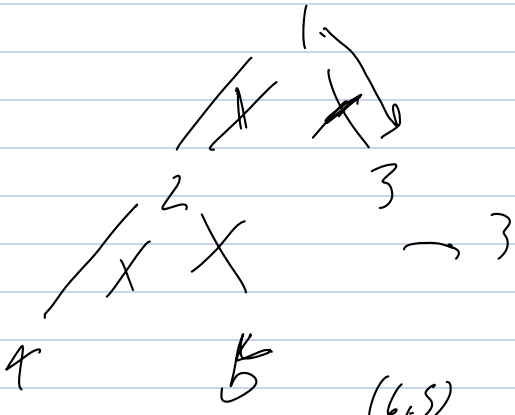
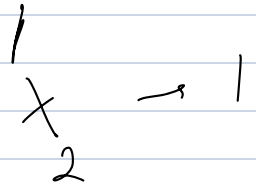
Given the root of a binary Tree, return length of diameter of binary tree

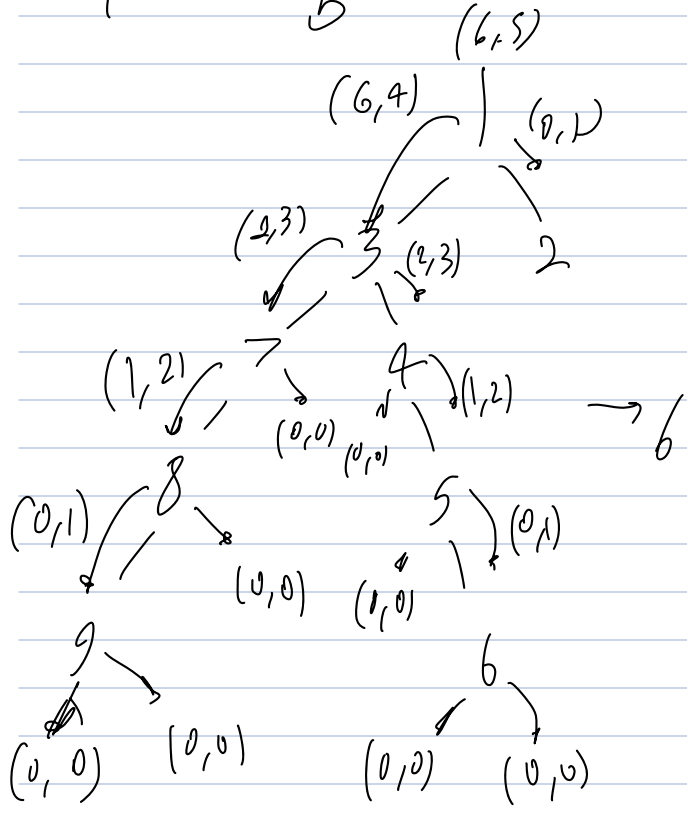
This is hard for me

diameter: length of the longest path between any two nodes

length of a longest path: # of edges







Goal: length of the longest path

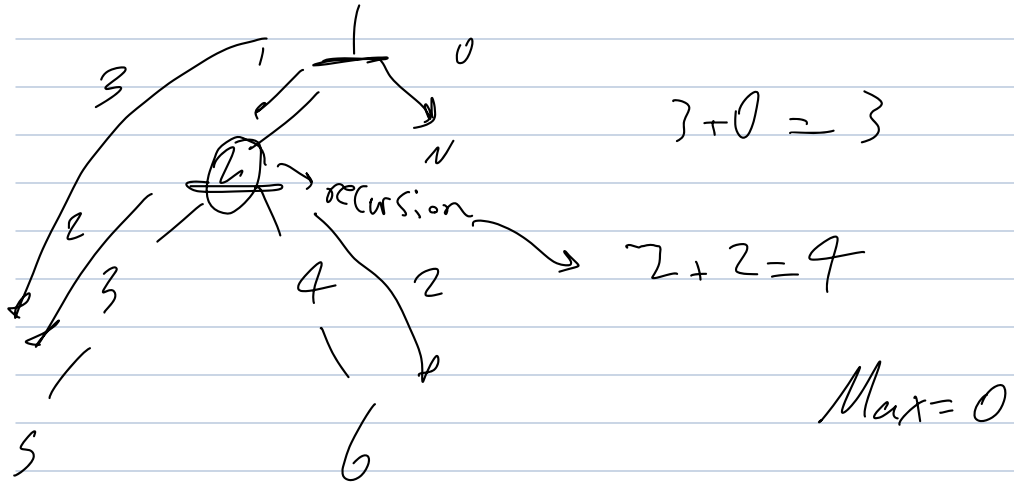
DFS

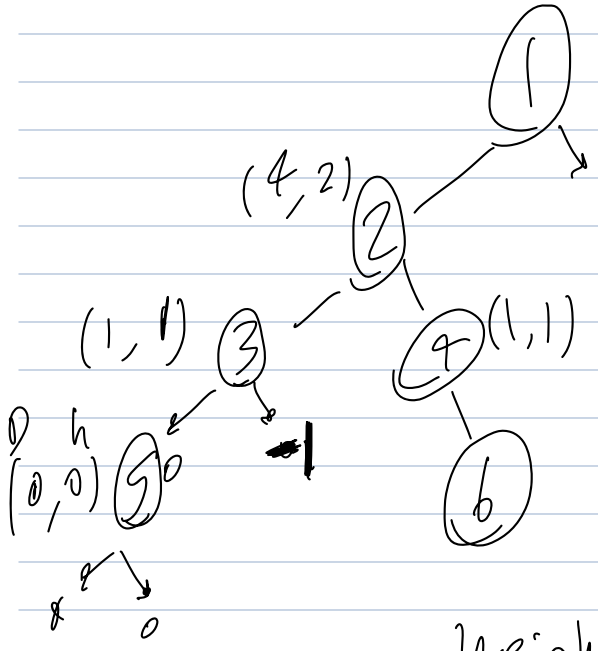
O(n) Time

O(n) space → worst case

O(h) → space → Avg case

Next code





weight → 1 + max(left, right)

diameter = $\frac{L+R+1+1}{2}$

= $\frac{0+-1+2}{2} = 1$

for node 2: 1+1+2 = 4

for root node

2+(-1)+2 = 3

$\rightarrow O(n)$