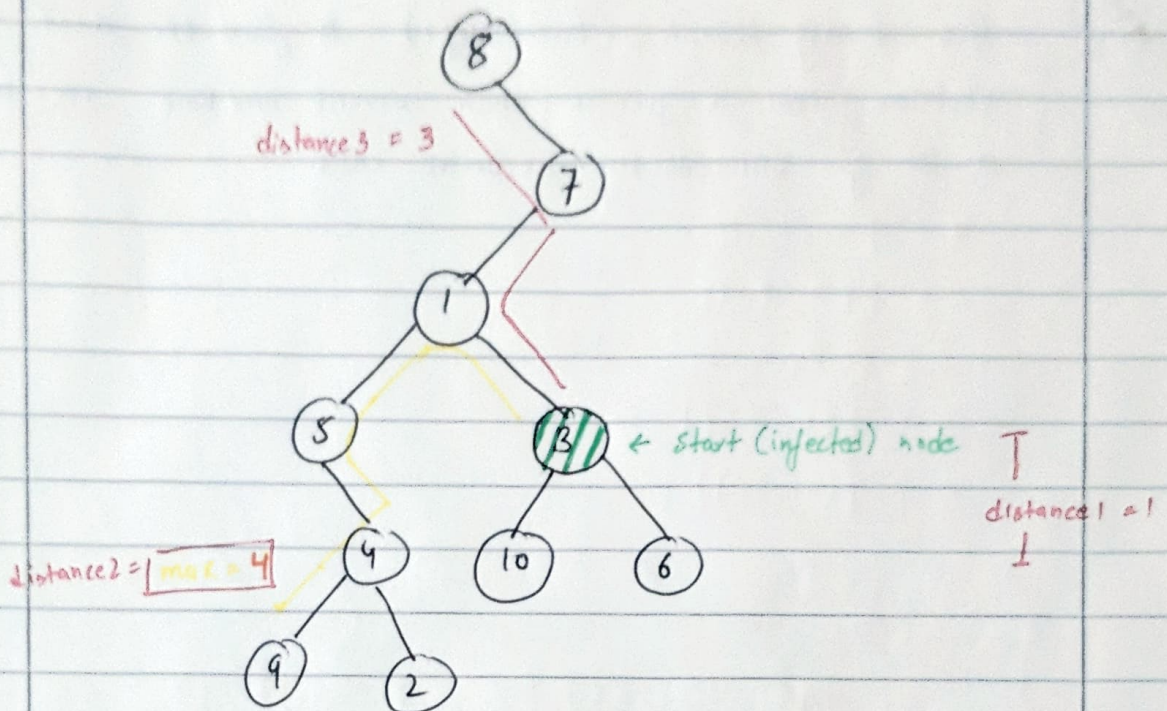


## 2.385: Amount of Time for Binary Tree to be infected

→ start node is given (not necessarily root node)



### ① BFS approach with level order

- 1) First tree has to be converted to a graph.
- 2) Graph gives the freedom to traverse from any node.

After making  
a graph  
adjacency list

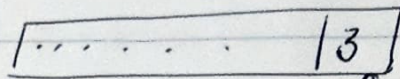
8 : 7  
7 : 8, 1  
1 : 7, 5, 3  
5 : 1, 4  
③ : 1, 10, 6  
4 : 5, 9, 2  
10 : 3  
6 : 3  
9 : 4  
2 : 4

we can start traversing  
from 3, directly.

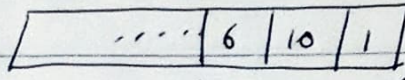


3) Do the BFS traversal

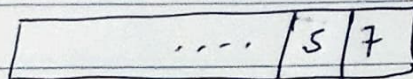
Queue:-



pop (add 1 minute)



all adjacent nodes of 3  
process all this and pop  
them and add 1 minute



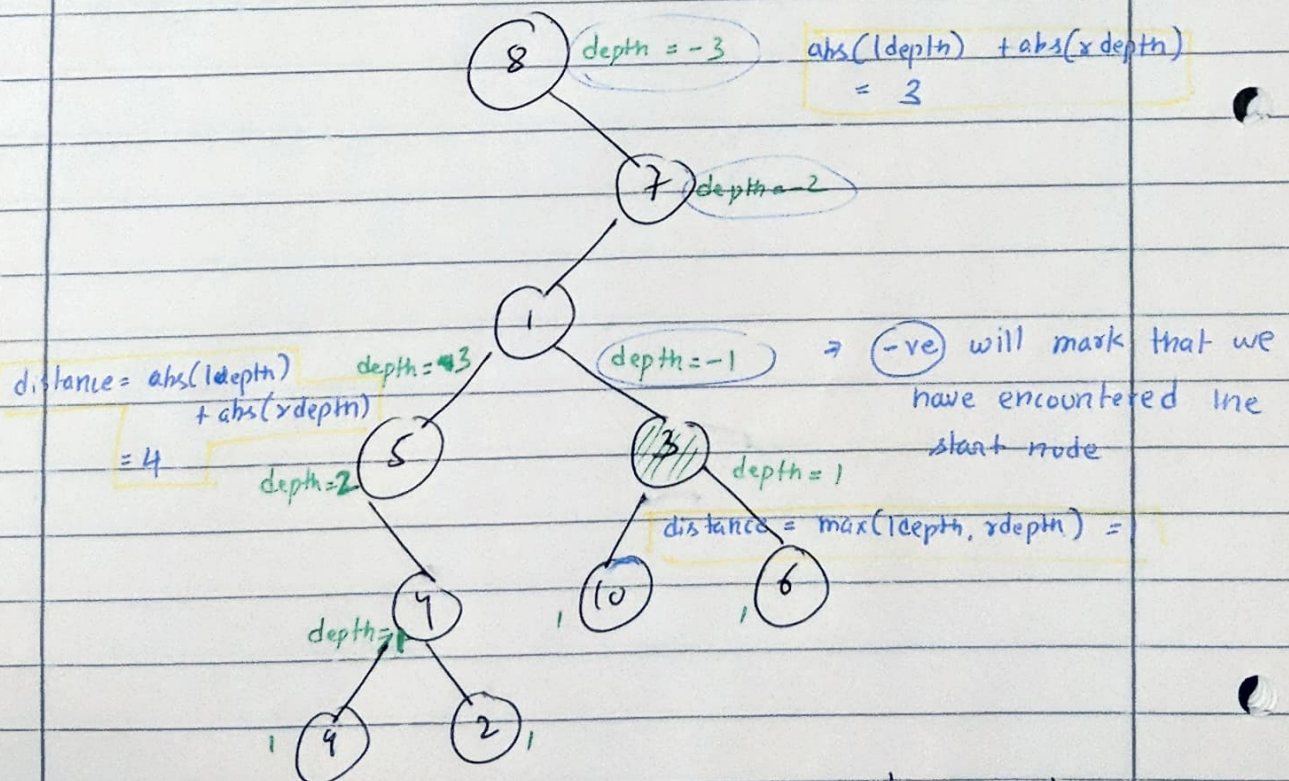
$O(2N)$  - space complexity  
 $O(2N)$  - time complexity

This way one can get the total minutes

2) One pass DFS (post-order)

What we want here is the maximum distance (farthest)  
we can go from the start node. (Check image on previous page)

output = max (distance1, distance2, distance3)



This logic will work everywhere.  
(all trees)