

Solution Review: Problem Challenge 1

We'll cover the following

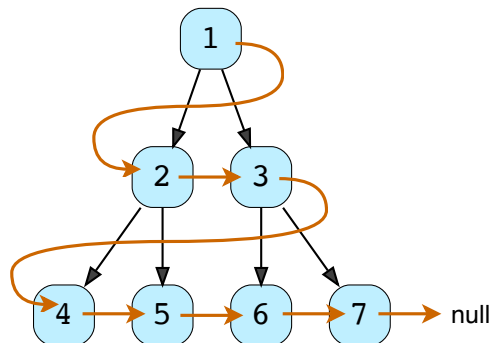


- Connect All Level Order Siblings (medium)
- Solution
- Code
 - Time complexity
 - Space complexity

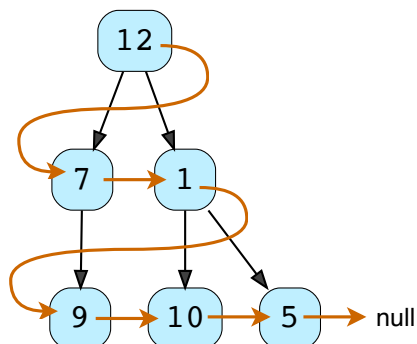
Connect All Level Order Siblings (medium)

Given a binary tree, connect each node with its level order successor. The last node of each level should point to the first node of the next level.

Example 1:



Example 2:







Solution #


This problem follows the Binary Tree Level Order Traversal




(<https://www.educative.io/collection/page/5668639101419520/5671464854355968/5726607939469312/>) pattern. We can follow the same **BFS** approach. The only difference will be that **while traversing we will remember (irrespective of the level) the previous node to connect it with the current node**.

Code

Here is what our algorithm will look like; only the highlighted lines have changed:

 Java	 Python3	 C++	 JS
<pre> 1 from __future__ import print_function 2 from collections import deque 3 4 5 class TreeNode: 6 def __init__(self, val): 7 self.val = val 8 self.left, self.right, self.next = None, None, None 9 10 # tree traversal using 'next' pointer 11 def print_tree(self): 12 print("Traversal using 'next' pointer: ", end='') 13 current = self 14 while current: 15 print(str(current.val) + " ", end='') 16 current = current.next 17 18 19 def connect_all_siblings(root): 20 if root is None: 21 return 22 23 queue = deque() 24 queue.append(root) 25 currentNode, previousNode = None, None 26 while queue: 27 currentNode = queue.popleft() 28 if previousNode: </pre>			



Time complexity

The time complexity of the above algorithm is $O(N)$, where 'N' is the total number of nodes in the tree. This is due to the fact that we traverse each node once.



Space complexity

The space complexity of the above algorithm will be $O(N)$ which is required for the queue. Since we can have a maximum of $N/2$ nodes at any level (this could happen only at the lowest level), therefore we will need $O(N)$ space to store them in the queue.

Problem Challenge 1

Problem Challenge 2

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