

116. Populating Next Right Pointers in Each Node

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- Depth-first Search + Tree

Description

Given a binary tree

```
struct TreeLinkNode {
    TreeLinkNode *left;
    TreeLinkNode *right;
    TreeLinkNode *next;
}
```

Populate each next pointer to point to its next right node. If there is no next right node, the next pointer should be set to **NULL**.

Initially, all next pointers are set to **NULL**.

Note:

- You may only use constant extra space.
- You may assume that it is a perfect binary tree (ie, all leaves are at the same level, and every parent has two children).

For example,

Given the following perfect binary tree,

```
      1
     / \
    2   3
   / \ / \
  4 5 6 7
```

After calling your function, the tree should look like:

```
      1 -> NULL
     / \
    2 -> 3 -> NULL
   / \ / \
  4->5->6->7 -> NULL
```

1. Thought line

2. Depth-first Search + Tree

```
/**
 * Definition for binary tree with next pointer.
 */
```

```
* struct TreeLinkNode {
*   int val;
*   TreeLinkNode *left, *right, *next;
*   TreeLinkNode(int x) : val(x), left(NULL), right(NULL), next(NULL) {}
* };
*/
class Solution {
private:
    void connect_fct(TreeLinkNode *node, TreeLinkNode *nodeNext) {
        if(node == nullptr) return;
        node->next = nodeNext;
        connect_fct(node->left, node->right);
        connect_fct(node->right, (nodeNext==nullptr)?nullptr:nodeNext->left);
    }
public:
    void connect(TreeLinkNode *root) {
        connect_fct(root, nullptr);
    }
};
```