101. Symmetric Tree

101 Symmetric Tree

- Depth-first Search + tree
- Breadth-first Search + tree

Description

Given a binary tree, check whether it is a mirror of itself (ie, symmetric around its center).

For example, this binary tree [1,2,2,3,4,4,3] is symmetric:

```
1
/\
2 2
/\\/
3 4 4 3
```

But the following [1,2,2,null,3,null,3] is not:

```
1
/\
2 2
\ \ \
3 3
```

Note:

Bonus points if you could solve it both recursively and iteratively.

1. Thought line

2. Breadth-first Search + tree

```
* Definition for a binary tree node.
    * struct TreeNode {
                               int val;
                               TreeNode *left;
                               TreeNode *right;
                                 TreeNode(int x) : val(x), left(NULL), right(NULL) {}
    * };
class Solution {
                   bool BreadthFirstSearchSymmetric(TreeNode* leftNode, TreeNode* rightNode){
                                      if (!leftNode && !rightNode) return true;
                                       if (leftNode && rightNode){
                                                           \texttt{return ((leftNode->val = rightNode->val)} \ \&\& \ \texttt{BreadthFirstSearchSymmetric(leftNode->left, rightNode->right)} \ \&\& \ \texttt{BreadthFirstSearchSymmetric(leftNode->right)} \ \&\& \ \texttt{BreadthFirstSearchSymmetric(leftNode->r
BreadthFirstSearchSymmetric(leftNode->right, rightNode->left));
                            }
                                     return false;
public:
                   bool isSymmetric(TreeNode* root) {
```

```
if (root==nullptr) return true;
    return BreadthFirstSearchSymmetric(root->left, root->right);
};
```