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1  /*Author: Bochen (mddboc@foxmail.com)
2  Last Modified: Tue Apr 10 22:28:44 CST 2018*/
3
4  /*Given a binary tree, check whether it is a mirror of itself (ie, symmetric around
   its center).
5
6  ..... For example, this binary tree [1,2,2,3,4,4,3] is symmetric:
7
8  ..... 1
9  ..... / \
10 ..... 2   2
11 ..... / \ / \
12 ..... 3  4 4  3
13 ..... But the following [1,2,2,null,3,null,3] is not:
14 ..... 1
15 ..... / \
16 ..... 2   2
17 ..... \   \
18 ..... 3   3
19 ..... Note:
20 ..... Bonus points if you could solve it both recursively and iteratively.*/
21
22
23 import java.util.*;
24 import java.lang.Math;
25 import java.lang.System;
26 import java.lang.Integer;
27
28
29 public class Main {
30
31     .... public static void main(String[] args) throws ArithmeticException {
32
33         ..... TreeNode root = new TreeNode(1);
34         ..... root.left = new TreeNode(2);
35         ..... root.right = new TreeNode(2);
36         ..... root.left.left = new TreeNode(3);
37         ..... root.left.right = new TreeNode(4);
38         ..... root.right.left = new TreeNode(4);
39         ..... root.right.right = new TreeNode(3);
40
41         ..... boolean result = new Solution().isSymmetric(root);
42
43         ..... System.out.println(result);
44         .... }
45
46     }
47
48
49     class ListNode {
50     .... int val;
51     .... ListNode next;
52
53     .... ListNode(int x) {
54     ..... val = x;
55     .... }
56     }
57
58
59     class TreeNode {
60     .... int val;
61     .... TreeNode left;
62     .... TreeNode right;
63
64     .... TreeNode(int x) {
65     ..... val = x;
66     .... }
67     }
68
69
70     class Solution {
71     .... public boolean isSymmetric(TreeNode root) {
72

```

```
73     .....if (root == null) {
74     .....    return true;
75     .....}
76
77     .....return isSymmetricHelper(root.left, root.right);
78     ....}
79
80     .....private boolean isSymmetricHelper(TreeNode left, TreeNode right) {
81
82     .....    if (left == null || right == null) {
83     .....        return left == right;
84     .....    }
85
86     .....    if (left.val != right.val) {
87     .....        return false;
88     .....    }
89
90     .....    return isSymmetricHelper(left.left, right.right) &&
91     .....        isSymmetricHelper(left.right, right.left);
92     ....}
```