Problem 1676: Lowest Common Ancestor of a Binary Tree IV

Problem Information

Difficulty: Medium
Acceptance Rate: 79.38%
Paid Only: Yes
Tags: Hash Table, Tree, Depth-First Search, Binary Tree

Problem Description

Given the `root` of a binary tree and an array of `TreeNode` objects `nodes`, return _the lowest common ancestor (LCA) of**all the nodes** in _`nodes`. All the nodes will exist in the tree, and all values of the tree's nodes are **unique**.

Extending the **[definition of LCA on Wikipedia](https://en.wikipedia.org/wiki/Lowest_common_ancestor)** : "The lowest common ancestor of `n` nodes `p1`, `p2`, ..., `pn` in a binary tree `T` is the lowest node that has every `pi` as a **descendant** (where we allow **a node to be a descendant of itself**) for every valid `i`". A **descendant** of a node `x` is a node `y` that is on the path from node `x` to some leaf node.

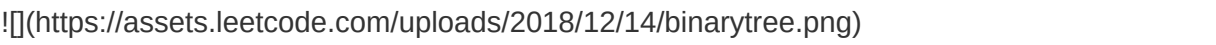
Example 1:

Input: root = [3,5,1,6,2,0,8,null,null,7,4], nodes = [4,7] **Output:** 2 **Explanation:** The lowest common ancestor of nodes 4 and 7 is node 2.

Example 2:

Input: root = [3,5,1,6,2,0,8,null,null,7,4], nodes = [1] **Output:** 1 **Explanation:** The lowest common ancestor of a single node is the node itself.

Example 3:



Input: root = [3,5,1,6,2,0,8,null,null,7,4], nodes = [7,6,2,4] **Output:** 5 **Explanation:** The lowest common ancestor of the nodes 7, 6, 2, and 4 is node 5.

Constraints:

* The number of nodes in the tree is in the range `[1, 104]`. * `-109 <= Node.val <= 109` * All `Node.val` are **unique**. * All `nodes[i]` will exist in the tree. * All `nodes[i]` are distinct.

Code Snippets

C++:

```
/**
* Definition for a binary tree node.
* struct TreeNode {
* int val;
* TreeNode *left;
* TreeNode *right;
* TreeNode() : val(0), left(nullptr), right(nullptr) {}
* TreeNode(int x) : val(x), left(nullptr), right(nullptr) {}
* TreeNode(int x, TreeNode *left, TreeNode *right) : val(x), left(left),
right(right) {}
* };
*/
class Solution {
public:
TreeNode* lowestCommonAncestor(TreeNode* root, vector<TreeNode*> &nodes) {

}
};
```

Java:

```
/**
* Definition for a binary tree node.
* public class TreeNode {
```

```
* int val;
* TreeNode left;
* TreeNode right;
* TreeNode(int x) { val = x; }
* }
*/
class Solution {
public TreeNode lowestCommonAncestor(TreeNode root, TreeNode[] nodes) {

}
}
```

Python3:

```
# Definition for a binary tree node.
# class TreeNode:
# def __init__(self, x):
# self.val = x
# self.left = None
# self.right = None

class Solution:
def lowestCommonAncestor(self, root: 'TreeNode', nodes: 'List[TreeNode]') ->
'TreeNode':
```