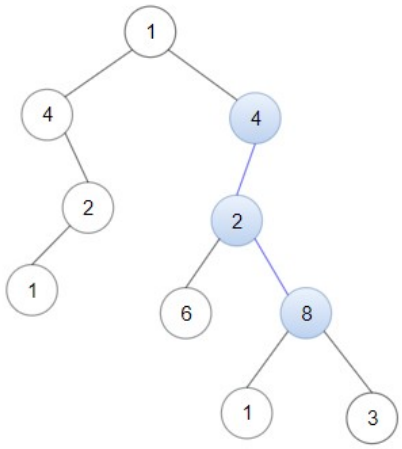
1367. Linked List in Binary Tree

Given a binary tree `root` and a linked list with `head` as the first node.

Return True if all the elements in the linked list starting from the `head` correspond to some *downward path* connected in the binary tree otherwise return False.

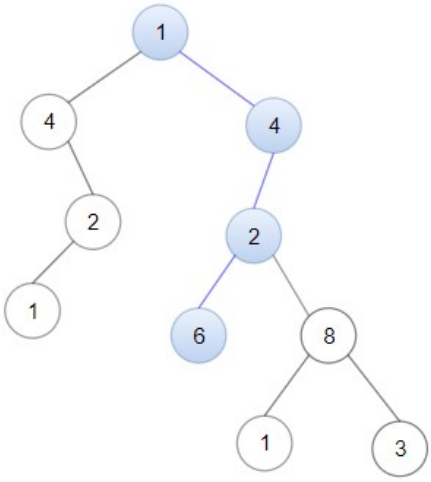
In this context downward path means a path that starts at some node and goes downwards.

Example 1:



Input: head = [4,2,8], root = [1,4,4,null,2,2,null,1,null,6,8,null,null,null,null,1,3]
Output: true
Explanation: Nodes in blue form a subpath in the binary Tree.

Example 2:



Input: head = [1,4,2,6], root = [1,4,4,null,2,2,null,1,null,6,8,null,null,null,null,1,3]
Output: true

Example 3:

Input: head = [1,4,2,6,8], root = [1,4,4,null,2,2,null,1,null,6,8,null,null,null,null,1,3]
Output: false
Explanation: There is no path in the binary tree that contains all the elements of the linked list from `head`.

Constraints:

- The number of nodes in the tree will be in the range `[1, 2500]`.
- The number of nodes in the list will be in the range `[1, 100]`.
- `1 <= Node.val <= 100` for each node in the linked list and binary tree.

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```
/*
   DFS (inorder)
   Time complexity: O(nm)
   Space complexity: O(n)
   n: number of nodes in binary tree
   m: number of nodes in linked list
*/
class Solution {
   public:
      bool dfs(TreeNode*& root,ListNode* head,ListNode* cur){
         if(!cur) return true;
         if(!root) return false;

         if(root->val==cur->val) cur=cur->next;
         else if(root->val==head->val) head=head->next;
         else cur=head;

         return dfs(root->left,head,cur) || dfs(root->right,head,cur);

      }

      bool isSubPath(ListNode* head, TreeNode* root) {
         return dfs(root,head,head);
      }
};
```