

3313. Find the Last Marked Nodes in Tree Premium

Hard Topics Hint

There exists an **undirected** tree with  $n$  nodes numbered  $0$  to  $n - 1$ . You are given a 2D integer array `edges` of length  $n - 1$ , where `edges[i] = [ui, vi]` indicates that there is an edge between nodes  $u_i$  and  $v_i$  in the tree.

Initially, **all** nodes are **unmarked**. After every second, you mark all unmarked nodes which have **at least** one marked node *adjacent* to them.

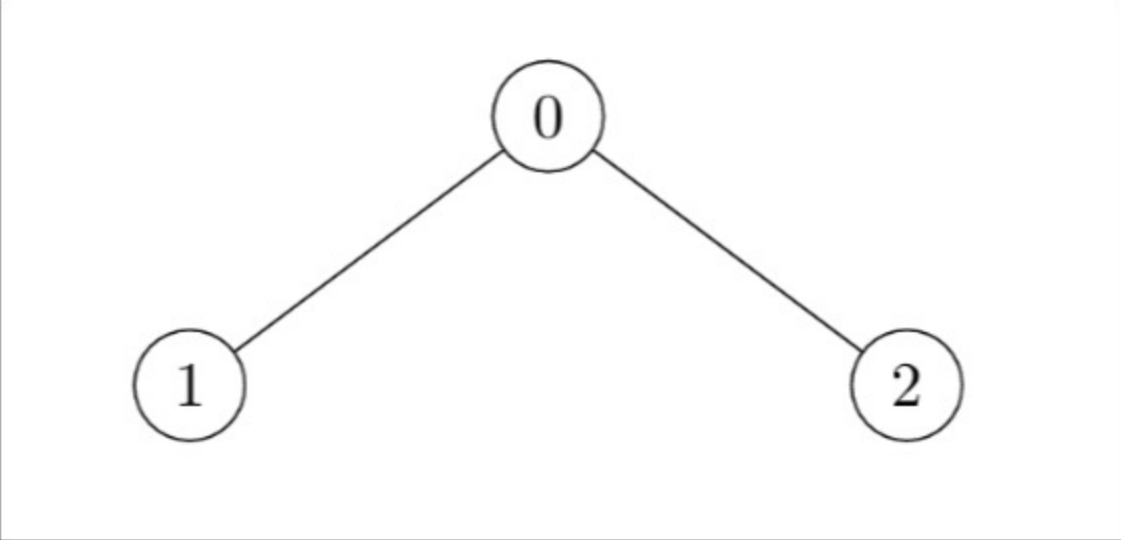
Return an array `nodes` where `nodes[i]` is the last node to get marked in the tree, if you mark node  $i$  at time  $t = 0$ . If `nodes[i]` has *multiple* answers for any node  $i$ , you can choose **any** one answer.

Example 1:

**Input:** edges = [[0,1],[0,2]]

**Output:** [2,2,1]

**Explanation:**



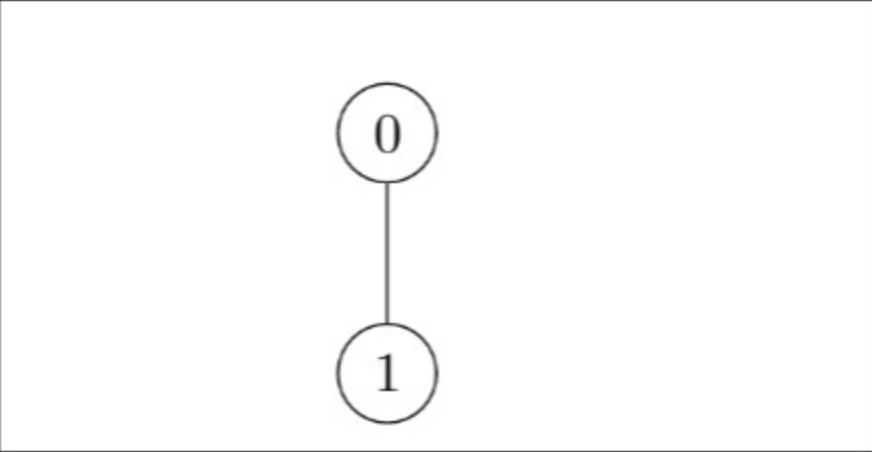
- For  $i = 0$ , the nodes are marked in the sequence: `[0] -> [0,1,2]`. Either 1 or 2 can be the answer.
- For  $i = 1$ , the nodes are marked in the sequence: `[1] -> [0,1] -> [0,1,2]`. Node 2 is marked last.
- For  $i = 2$ , the nodes are marked in the sequence: `[2] -> [0,2] -> [0,1,2]`. Node 1 is marked last.

Example 2:

**Input:** edges = [[0,1]]

**Output:** [1,0]

**Explanation:**



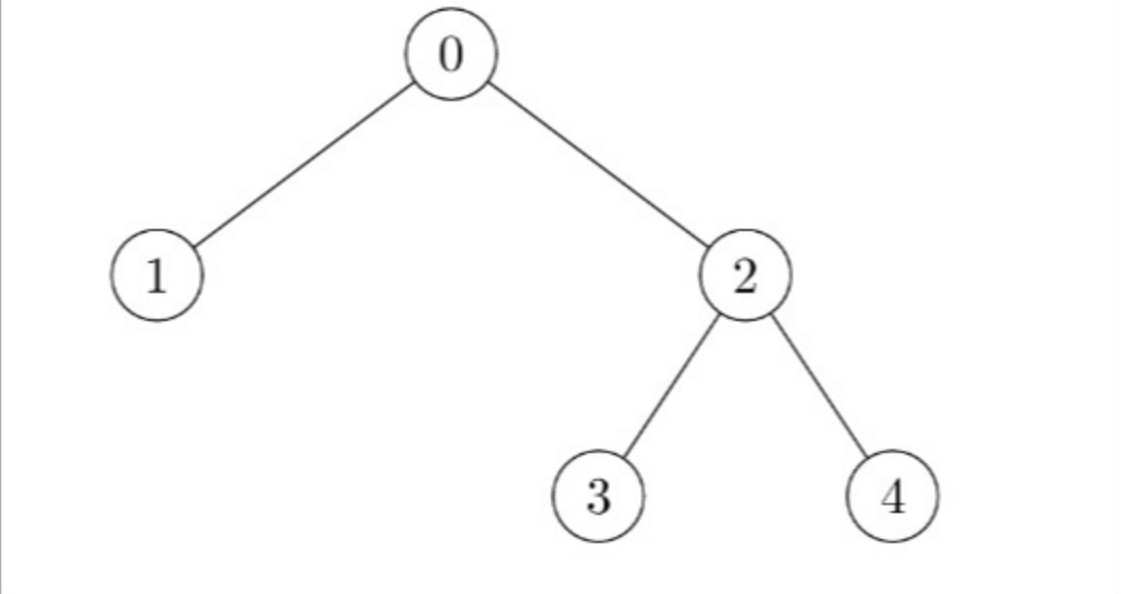
- For  $i = 0$ , the nodes are marked in the sequence: `[0] -> [0,1]`.
- For  $i = 1$ , the nodes are marked in the sequence: `[1] -> [0,1]`.

Example 3:

**Input:** edges = [[0,1],[0,2],[2,3],[2,4]]

**Output:** [3,3,1,1,1]

**Explanation:**



- For  $i = 0$ , the nodes are marked in the sequence: `[0] -> [0,1,2] -> [0,1,2,3,4]`.
- For  $i = 1$ , the nodes are marked in the sequence: `[1] -> [0,1] -> [0,1,2] -> [0,1,2,3,4]`.
- For  $i = 2$ , the nodes are marked in the sequence: `[2] -> [0,2,3,4] -> [0,1,2,3,4]`.
- For  $i = 3$ , the nodes are marked in the sequence: `[3] -> [2,3] -> [0,2,3,4] -> [0,1,2,3,4]`.
- For  $i = 4$ , the nodes are marked in the sequence: `[4] -> [2,4] -> [0,2,3,4] -> [0,1,2,3,4]`.

Constraints:

- $2 \leq n \leq 10^5$
- `edges.length == n - 1`
- `edges[i].length == 2`
- $0 \leq \text{edges[i][0]}, \text{edges[i][1]} \leq n - 1$
- The input is generated such that `edges` represents a valid tree.

Seen this question in a real interview before? 1/5

Yes No

Accepted 241 | Submissions 335 | Acceptance Rate 71.9%

Topics

Tree

Depth-First Search

Hint 1

We need to calculate the height of tree when rooted at each node.

Hint 2

Find a diameter using two DFS.

Hint 3

The farthest node from each node must be one of the endpoints of the diameter.

Hint 4

The last marked node will be one of the end of the diameter, whichever is more distant.

Similar Questions

Minimum Time to Visit Disappearing NodesMedium

Time Taken to Mark All NodesHard

Discussion (0)