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Description

Solution

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310. Minimum Height Trees

Medium

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A tree is an undirected graph in which any two vertices are connected by *exactly* one path. In other words, any connected graph without simple cycles is a tree.

Given a tree of n nodes labelled from 0 to $n - 1$, and an array of $n - 1$ edges where $edges[i] = [a_i, b_i]$ indicates that there is an undirected edge between the two nodes a_i and b_i in the tree, you can choose any node of the tree as the root. When you select a node x as the root, the result tree has height h . Among all possible rooted trees, those with minimum height (i.e. $\min(h)$) are called **minimum height trees** (MHTs).

Return a list of all **MHTs'** root labels. You can return the answer in **any order**.

The **height** of a rooted tree is the number of edges on the longest downward path between the root and a leaf.

Example 1:

```
graph TD
    subgraph T1 [Root 1]
        1 --- 0
        1 --- 2
        1 --- 3
    end
    subgraph T2 [Root 0]
        0 --- 1
        1 --- 2
        1 --- 3
    end
    subgraph T3 [Root 2]
        2 --- 1
        1 --- 0
        1 --- 3
    end
    subgraph T4 [Root 3]
        3 --- 1
        1 --- 0
        1 --- 2
    end
```

Input: $n = 4$, $edges = [[1,0],[1,2],[1,3]]$
Output: $[1]$
Explanation: As shown, the height of the tree is 1 when the root is the node with label 1 which is the only MHT.

Example 2:

```
graph TD
    subgraph T1 [Root 3]
        3 --- 0
        3 --- 1
        3 --- 2
        3 --- 4
        4 --- 5
    end
    subgraph T2 [Root 4]
        4 --- 5
        4 --- 3
        3 --- 0
        3 --- 1
        3 --- 2
    end
```

Input: $n = 6$, $edges = [[3,0],[3,1],[3,2],[3,4],[5,4]]$
Output: $[3,4]$

Example 3:

Input: $n = 1$, $edges = []$
Output: $[0]$

Example 4:

Input: $n = 2$, $edges = [[0,1]]$
Output: $[0,1]$

Constraints:

- $1 \leq n \leq 2 \cdot 10^4$
- $edges.length == n - 1$
- $0 \leq a_i, b_i < n$
- $a_i \neq b_i$
- All the pairs (a_i, b_i) are distinct.
- The given input is **guaranteed** to be a tree and there will be **no repeated edges**.

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No

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```
1 class Solution {
2     public List<Integer> findMinHeightTrees(int n, int[][] edges) {
3
4     }
5 }
```

Problems

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Console

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