Problem 2277: Closest Node to Path in Tree

Problem Information

Difficulty: Hard
Acceptance Rate: 62.21%
Paid Only: Yes
Tags: Array, Tree, Depth-First Search, Breadth-First Search

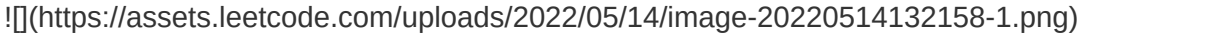
Problem Description

You are given a positive integer `n` representing the number of nodes in a tree, numbered from `0` to `n - 1` (**inclusive**). You are also given a 2D integer array `edges` of length `n - 1`, where `edges[i] = [node1i, node2i]` denotes that there is a **bidirectional** edge connecting `node1i` and `node2i` in the tree.

You are given a **0-indexed** integer array `query` of length `m` where `query[i] = [starti, endi, nodei]` means that for the `ith` query, you are tasked with finding the node on the path from `starti` to `endi` that is **closest** to `nodei`.

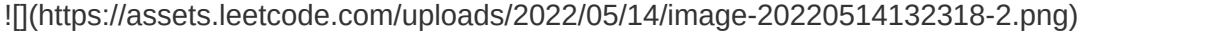
Return _an integer array_`answer` _of length_`m` _, where_`answer[i]`_is the answer to the_`ith` _query_.

Example 1:



Input: n = 7, edges = [[0,1],[0,2],[0,3],[1,4],[2,5],[2,6]], query = [[5,3,4],[5,3,6]] **Output:** [0,2] **Explanation:** The path from node 5 to node 3 consists of the nodes 5, 2, 0, and 3. The distance between node 4 and node 0 is 2. Node 0 is the node on the path closest to node 4, so the answer to the first query is 0. The distance between node 6 and node 2 is 1. Node 2 is the node on the path closest to node 6, so the answer to the second query is 2.

Example 2:



Input: n = 3, edges = [[0,1],[1,2]], query = [[0,1,2]] **Output:** [1] **Explanation:** The path from node 0 to node 1 consists of the nodes 0, 1. The distance between node 2 and node 1 is 1. Node 1 is the node on the path closest to node 2, so the answer to the first query is 1.

Example 3:

Input: n = 3, edges = [[0,1],[1,2]], query = [[0,0,0]] **Output:** [0] **Explanation:** The path from node 0 to node 0 consists of the node 0. Since 0 is the only node on the path, the answer to the first query is 0.

Constraints:

* `1 <= n <= 1000` * `edges.length == n - 1` * `edges[i].length == 2` * `0 <= node1i, node2i <= n - 1` * `node1i != node2i` * `1 <= query.length <= 1000` * `query[i].length == 3` * `0 <= starti, endi, nodei <= n - 1` * The graph is a tree.

Code Snippets

C++:

```
class Solution {
public:
vector<int> closestNode(int n, vector<vector<int>>& edges,
vector<vector<int>>& query) {

}
};
```

Java:

```
class Solution {
public int[] closestNode(int n, int[][] edges, int[][] query) {

}
}
```

Python3:

```
class Solution:
def closestNode(self, n: int, edges: List[List[int]], query: List[List[int]])
-> List[int]:
```