2277. Closest Node to Path in Tree Premium

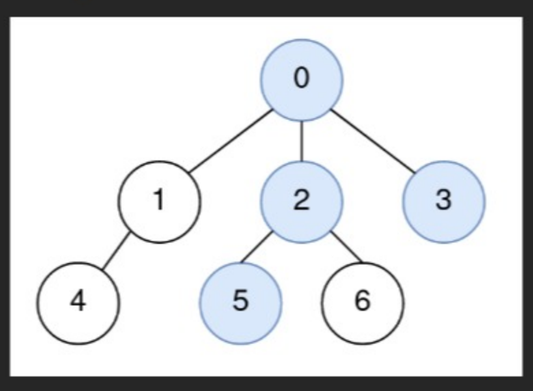
Hard Topics Hint

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`.

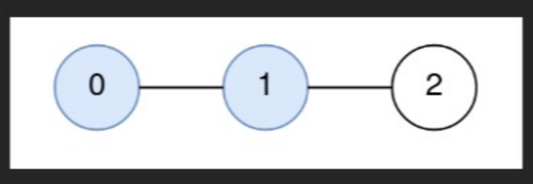
Return *an integer array* `answer` *of length* `m`*, where* `answer[i]` *is the answer to the* `iᵗʰ` *query.*

Example 1:



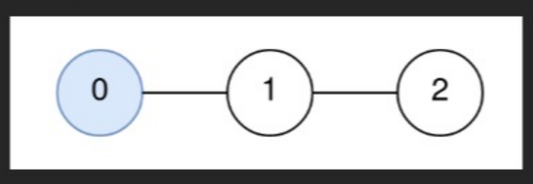

```
Input: n = 7, edges = [[0,1],[0,2],[0,3],[1,4],[2,5],[2,6]], query = [[5,3,4],[5,3,6]]
Output: [0,2]
Explanation:
The path from node 5 to node 3 consists of the nodes 5, 2, 0, and 3.
The distance between node 4 and node 0 is 2.
Node 0 is the node on the path closest to node 4, so the answer to the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

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

Yes No

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Topics

Array Tree Depth-First Search Breadth-First Search

Hint 1

For the ith query, find the distance from node_i to every other node in the tree.

Hint 2

We can use a BFS to find the distances.

Hint 3

Use DFS to find all the nodes on the path from start_i to end_i.

Similar Questions

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Discussion (1)