Problem 2204: Distance to a Cycle in Undirected Graph

Problem Information

Difficulty: Hard
Acceptance Rate: 73.13%
Paid Only: Yes
Tags: Depth-First Search, Breadth-First Search, Union Find, Graph

Problem Description

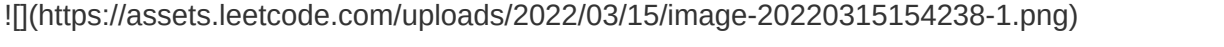
You are given a positive integer `n` representing the number of nodes in a **connected undirected graph** containing **exactly one** cycle. The nodes are numbered from `0` to `n - 1` (**inclusive**).

You are also given a 2D integer array `edges`, where `edges[i] = [node1i, node2i]` denotes that there is a **bidirectional** edge connecting `node1i` and `node2i` in the graph.

The distance between two nodes `a` and `b` is defined to be the **minimum** number of edges that are needed to go from `a` to `b`.

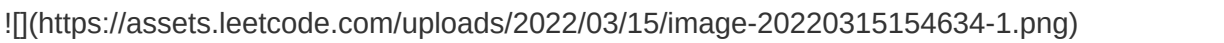
Return _an integer array`answer`_ _of size_`n` _, where_`answer[i]`_is the**minimum** distance between the _`ith` _node and**any** node in the cycle._

Example 1:



Input: n = 7, edges = [[1,2],[2,4],[4,3],[3,1],[0,1],[5,2],[6,5]] **Output:** [1,0,0,0,0,1,2] **Explanation:** The nodes 1, 2, 3, and 4 form the cycle. The distance from 0 to 1 is 1. The distance from 1 to 1 is 0. The distance from 2 to 2 is 0. The distance from 3 to 3 is 0. The distance from 4 to 4 is 0. The distance from 5 to 2 is 1. The distance from 6 to 2 is 2.

Example 2:



Input: n = 9, edges = [[0,1],[1,2],[0,2],[2,6],[6,7],[6,8],[0,3],[3,4],[3,5]] **Output:** [0,0,0,1,2,2,1,2,2] **Explanation:** The nodes 0, 1, and 2 form the cycle. The distance from 0 to 0 is 0. The distance from 1 to 1 is 0. The distance from 2 to 2 is 0. The distance from 3 to 1 is 1. The distance from 4 to 1 is 2. The distance from 5 to 1 is 2. The distance from 6 to 2 is 1. The distance from 7 to 2 is 2. The distance from 8 to 2 is 2.

Constraints:

* `3 <= n <= 105` * `edges.length == n` * `edges[i].length == 2` * `0 <= node1i, node2i <= n - 1` * `node1i != node2i` * The graph is connected. * The graph has exactly one cycle. * There is at most one edge between any pair of vertices.

Code Snippets

C++:

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

}
};
```

Java:

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

}
}
```

Python3:

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