6135. Longest Cycle in a Graph

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User Accepted:	0
User Tried:	0
Total Accepted:	0
Total Submissions:	0
Difficulty:	Hard

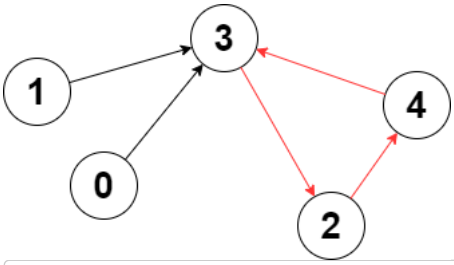
You are given a **directed** graph of `n` nodes numbered from `0` to `n - 1`, where each node has **at most one** outgoing edge.

The graph is represented with a given **0-indexed** array `edges` of size `n`, indicating that there is a directed edge from node `i` to node `edges[i]`. If there is no outgoing edge from node `i`, then `edges[i] == -1`.

Return *the length of the **longest** cycle in the graph*. If no cycle exists, return `-1`.

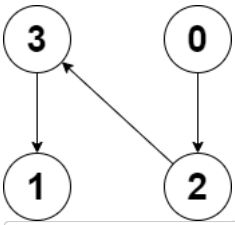
A cycle is a path that starts and ends at the **same** node.

Example 1:




```
Input: edges = [3,3,4,2,3]
Output: 3
Explanation: The longest cycle in the graph is the cycle: 2 -> 4 -> 3 -> 2.
The length of this cycle is 3, so 3 is returned.
```

Example 2:




```
Input: edges = [2,-1,3,1]
Output: -1
Explanation: There are no cycles in this graph.
```

Constraints:

- `n == edges.length`
- `2 <= n <= 10^5`
- `-1 <= edges[i] < n`
- `edges[i] != i`

JavaScript

```
const longestCycle = (edges) => {
    let n = edges.length, g = Array(n).fill(-1);
    for (let i = 0; i < n; i++) {
        if (edges[i] != -1) g[i] = edges[i];
    }
    return detectLongestCycleDG(g);
};

const detectLongestCycleDG = (g) => { // each node's child <= 1
    let n = g.length, cycleStart = Array(n).fill(-1), dis = Array(n).fill(Number.MAX_SAFE_INTEGER), res = -1;
    for (let i = 0; i < n; i++) {
        if (cycleStart[i] == -1) {
            let cur = i, step = 0
```

```
            while (cur != -1) {
                if (dis[cur] != Number.MAX_SAFE_INTEGER) {
                    if (cycleStart[cur] == i) { // cycle find
                        res = Math.max(res, step - dis[cur]);
                    }
                    break;
                }
                dis[cur] = step;
                cycleStart[cur] = i;
                cur = g[cur];
                step++;
            }
        }
    }
    return res;
};
```

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