1296. Kth Ancestor of a Tree Node

Difficulty : Hard

https://leetcode.com/problems/kth-ancestor-of-a-tree-node

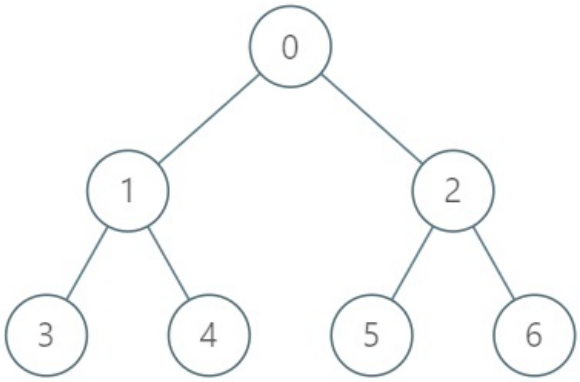
You are given a tree with `n` nodes numbered from `0` to `n - 1` in the form of a parent array `parent` where `parent[i]` is the parent of i^{th} node. The root of the tree is node `0`. Find the k^{th} ancestor of a given node.

The k^{th} ancestor of a tree node is the k^{th} node in the path from that node to the root node.

Implement the `TreeAncestor` class:

- `TreeAncestor(int n, int[] parent)` Initializes the object with the number of nodes in the tree and the parent array.
- `int getKthAncestor(int node, int k)` return the k^{th} ancestor of the given node `node`. If there is no such ancestor, return `-1`.

Example 1:



Input
```
["TreeAncestor", "getKthAncestor", "getKthAncestor", "getKthAncestor"]
[[7, [-1, 0, 0, 1, 1, 2, 2]], [3, 1], [5, 2], [6, 3]]
```
Output
```
[null, 1, 0, -1]
```

Explanation
```
TreeAncestor treeAncestor = new TreeAncestor(7, [-1, 0, 0, 1, 1, 2, 2]);
treeAncestor.getKthAncestor(3, 1); // returns 1 which is the parent of 3
treeAncestor.getKthAncestor(5, 2); // returns 0 which is the grandparent of 5
treeAncestor.getKthAncestor(6, 3); // returns -1 because there is no such ancestor
```

Constraints:

- `1 <= k <= n <= 5 * 10^4`
- `parent.length == n`
- `parent[0] == -1`
- `0 <= parent[i] < n` for all `0 < i < n`
- `0 <= node < n`
- There will be at most `5 * 10^4` queries.