# 3218. Find Number of Coins to Place in Tree Nodes

# Difficulty : Hard

https://leetcode.com/problems/find-number-of-coins-to-place-in-tree-nodes

You are given an **undirected** tree with `n` nodes labeled from `0` to `n - 1`, and rooted at node `0`. You are given a 2D integer array `edges` of length `n - 1`, where `edges[i] = [a_i, b_i]` indicates that there is an edge between nodes $a_i$ and $b_i$ in the tree.

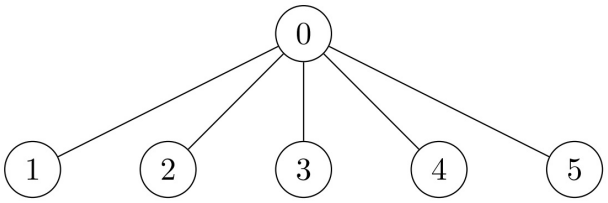
You are also given a **0-indexed** integer array `cost` of length `n`, where `cost[i]` is the **cost** assigned to the $i^{th}$ node.

You need to place some coins on every node of the tree. The number of coins to be placed at node `i` can be calculated as:

- If size of the subtree of node `i` is less than `3`, place `1` coin.
- Otherwise, place an amount of coins equal to the **maximum** product of cost values assigned to `3` distinct nodes in the subtree of node `i`. If this product is **negative**, place `0` coins.

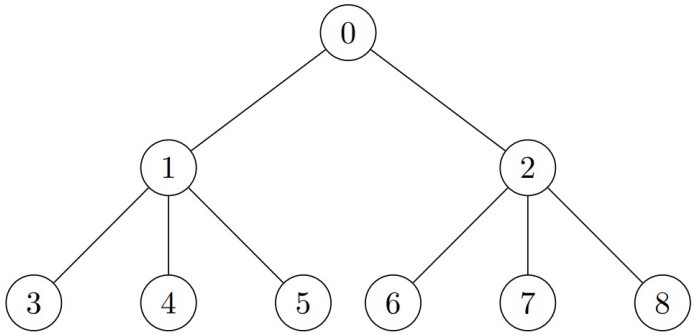
Return *an array* `coin` *of size* `n` *such that* `coin[i]` *is the number of coins placed at node* `i`.

**Example 1:**



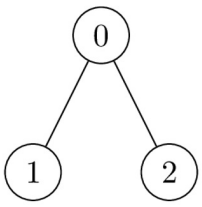

```
Input: edges = [[0,1],[0,2],[0,3],[0,4],[0,5]], cost = [1,2,3,4,5,6]
Output: [120,1,1,1,1,1]
Explanation: For node 0 place 6 * 5 * 4 = 120 coins. All other nodes are leaves with subtree of size 1, place 1 coin on each of them.
```

**Example 2:**




```
Input: edges = [[0,1],[0,2],[1,3],[1,4],[1,5],[2,6],[2,7],[2,8]], cost = [1,4,2,3,5,7,8,-4,2]
Output: [280,140,32,1,1,1,1,1,1]
Explanation: The coins placed on each node are:
- Place 8 * 7 * 5 = 280 coins on node 0.
- Place 7 * 5 * 4 = 140 coins on node 1.
- Place 8 * 2 * 2 = 32 coins on node 2.
- All other nodes are leaves with subtree of size 1, place 1 coin on each of them.
```

**Example 3:**




```
Input: edges = [[0,1],[0,2]], cost = [1,2,-2]
Output: [0,1,1]
Explanation: Node 1 and 2 are leaves with subtree of size 1, place 1 coin on each of them. For node 0 the only possible product of cost is 2 * 1 * -2 = -4. Hence place 0 coins on node 0.
```

**Constraints:**

- `2 <= n <= 2 * 10^4`
- `edges.length == n - 1`
- `edges[i].length == 2`
- `0 <= a_i, b_i < n`
- `cost.length == n`
- `1 <= |cost[i]| <= 10^4`
- The input is generated such that `edges` represents a valid tree.