2378. Choose Edges to Maximize Score in a Tree Premium

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You are given a **weighted** tree consisting of `n` nodes numbered from `0` to `n - 1`.

The tree is **rooted** at node `0` and represented with a **2D** array `edges` of size `n` where `edges[i] = [par_i, weight_i]` indicates that node `par_i` is the **parent** of node `i`, and the edge between them has a weight equal to `weight_i`. Since the root does **not** have a parent, you have `edges[0] = [-1, -1]`.

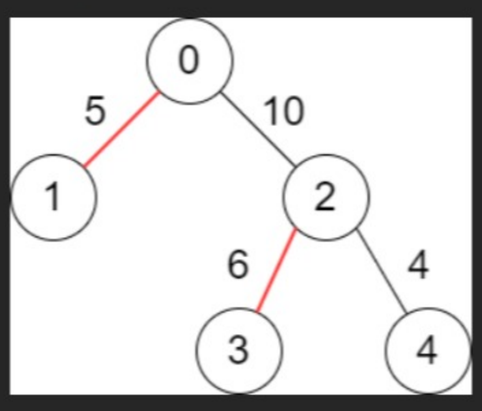
Choose some edges from the tree such that no two chosen edges are **adjacent** and the **sum** of the weights of the chosen edges is maximized.

Return *the **maximum** sum of the chosen edges*.

Note:

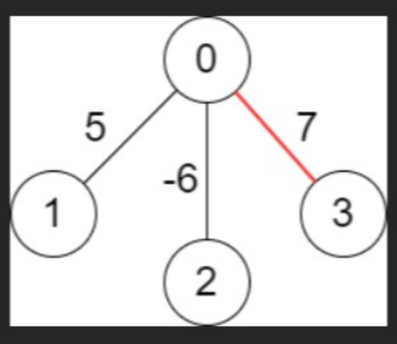
- You are allowed to **not** choose any edges in the tree, the sum of weights in this case will be `0`.
- Two edges `Edge_1` and `Edge_2` in the tree are **adjacent** if they have a **common** node.
  - In other words, they are adjacent if `Edge_1` connects nodes `a` and `b` and `Edge_2` connects nodes `b` and `c`.

Example 1:




```
Input: edges = [[-1,-1],[0,5],[0,10],[2,6],[2,4]]
Output: 11
Explanation: The above diagram shows the edges that we have to choose colored in red.
The total score is 5 + 6 = 11.
It can be shown that no better score can be obtained.
```

Example 2:




```
Input: edges = [[-1,-1],[0,5],[0,-6],[0,7]]
Output: 7
Explanation: We choose the edge with weight 7.
Note that we cannot choose more than one edge because all edges are adjacent to each other.
```

Constraints:

- `n == edges.length`
- `1 <= n <= 10^5`
- `edges[i].length == 2`
- `par_0 == weight_0 == -1`
- `0 <= par_i <= n - 1` for all `i >= 1`.
- `par_i != i`
- `-10^6 <= weight_i <= 10^6` for all `i >= 1`.
- `edges` represents a valid tree.

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

Yes No

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Hint 1

Use dynamic programming to recursively solve the problem for smaller subtrees.

Hint 2

You can ignore the edges with negative weights.

Hint 3

The states of the dp are the following: the root of the subtree you are at, and a boolean variable that will tell you if you have chosen the edge that connects that node and its parent.

Hint 4

What are the transitions of this dp?

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