

1912. Number of Restricted Paths From First to Last Node

Difficulty : Medium

<https://leetcode.com/problems/number-of-restricted-paths-from-first-to-last-node>

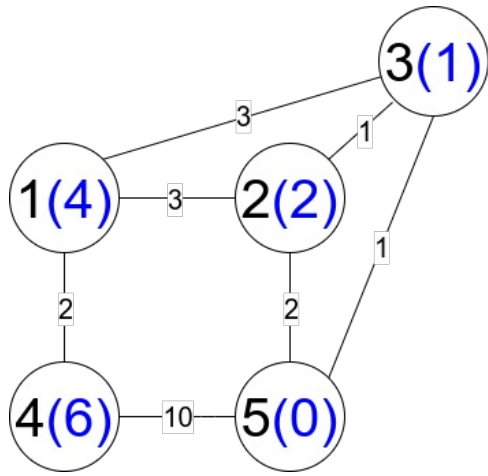
There is an undirected weighted connected graph. You are given a positive integer n which denotes that the graph has n nodes labeled from 1 to n , and an array `edges` where each `edges[i] = [ui, vi, weighti]` denotes that there is an edge between nodes u_i and v_i with weight equal to `weighti`.

A path from node `start` to node `end` is a sequence of nodes $[z_0, z_1, z_2, \dots, z_k]$ such that $z_0 = \text{start}$ and $z_k = \text{end}$ and there is an edge between z_i and z_{i+1} where $0 \leq i \leq k-1$.

The distance of a path is the sum of the weights on the edges of the path. Let `distanceToLastNode(x)` denote the shortest distance of a path between node n and node x . A **restricted path** is a path that also satisfies that `distanceToLastNode(zi) > distanceToLastNode(zi+1)` where $0 \leq i \leq k-1$.

Return the number of restricted paths from node 1 to node n . Since that number may be too large, return it **modulo** $10^9 + 7$.

Example 1:



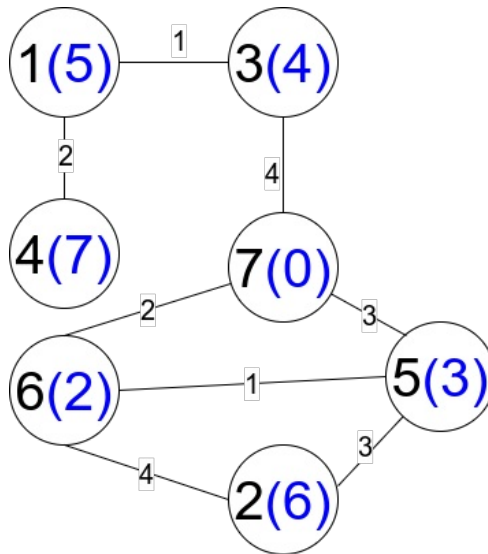
Input: $n = 5$, `edges = [[1,2,3],[1,3,3],[2,3,1],[1,4,2],[5,2,2],[3,5,1],[5,4,10]]`

Output: 3

Explanation: Each circle contains the node number in black and its `distanceToLastNode` value in blue. The three restricted paths are:

- 1) 1 --> 2 --> 5
- 2) 1 --> 2 --> 3 --> 5
- 3) 1 --> 3 --> 5

Example 2:



Input: $n = 7$, `edges = [[1,3,1],[4,1,2],[7,3,4],[2,5,3],[5,6,1],[6,7,2],[7,5,3],[2,6,4]]`

Output: 1

Explanation: Each circle contains the node number in black and its `distanceToLastNode` value in blue. The only restricted path is 1 --> 3 --> 7.

Constraints:

- $1 \leq n \leq 2 * 10^4$

- $n - 1 \leq \text{edges.length} \leq 4 * 10^4$
- $\text{edges}[i].\text{length} == 3$
- $1 \leq u_i, v_i \leq n$
- $u_i \neq v_i$
- $1 \leq \text{weight}_i \leq 10^5$
- There is at most one edge between any two nodes.
- There is at least one path between any two nodes.