Discover Singapore 2019 by Moscow Workshops
Day 5, 300iq Contest, Thursday, September 26, 2019

S:T
Schaffhausen
Institute of
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Problem I. Cactus is Money

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 mebibytes

A **Cactus graph** is a simple connected undirected graph where each edge lies in at most one simple cycle.

You have a cactus graph, each edge has two non-negative integer weights a_i, b_i.

Your goal is to find the spanning tree of given cactus with a minimum value of $(\sum a_i) \cdot (\sum b_i)$, where the sum is taken among all edges which are present in spanning tree.

Input

The first line contains n, m, denoting the number of vertices and edges of the cactus graph. $(1 \leq n \leq 50\,000, 0 \leq m \leq 250\,000)$

In the next m lines, four integers s, e, a_i, b_i denoting endpoints of the i-th edge and its weights are given. $(1 \leq s, e \leq n, s \neq e, 0 \leq a_i, b_i \leq 50000)$.

It is guaranteed that the graph is connected, it does not contain loops or multiple edges, and every edge belongs to at most one simple cycle.

Output

Output one integer: minimum possible value of $(\sum a_i) \cdot (\sum b_i)$, where the sum is taken among all edges which are present in spanning tree.

Example

standard input	standard output
3 3 1 2 0 1000 2 3 0 1000 3 1 1 1	0