F. Parametric Circulation

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Vova has recently learned what a *circulaton* in a graph is. Recall the definition: let G = (V, E) be a directed graph. A circulation f is such a collection of non-negative real numbers f_e ($e \in E$), that for each vertex $v \in V$ the following *con servation* condition holds:

$$\sum e \in \delta^{-}(v) f_e = \sum e \in \delta^{+}(v) f_e$$

where $\delta^{+}(v)$ is the set of edges that end in the vertex v, and $\delta^{-}(v)$ is the set of edges that start in the vertex v. In other words, for each vertex the total incoming flow should be equal to the total outcoming flow.

Let a lr-circulation be such a circulation f that for each edge the condition $l_e \leq f_e \leq r_e$ holds, where l_e and r_e for each edge $e \in E$ are two non-negative real numbers denoting the lower and upper bounds on the value of the circulation on this edge e.

Vova can't stop thinking about applications of a new topic. Right now he thinks about the following *natural* question: let the graph be fixed, and each value l_e and r_e be a linear function of a real variable t:

$$l_e(t) = a_e t + b_e \quad r_e(t) = c_e t + d_e$$

Note that t is the **same** for all edges.

Let t be chosen at random from uniform distribution on a segment [0, 1]. What is the probability of existence of lr-circulation in the graph?

Input

The first line contains two integers n, m ($1 \leq n \leq 1000$, $1 \leq m \leq 2000$).

Each of the next m lines describes edges of the graph in the format u_e, v_e, a_e, b_e, c_e, d_e ($1 \leq u_e, v_e \leq n$, $-10^4 \leq a_e, c_e \leq 10^4$, $0 \leq b_e, d_e \leq 10^4$), where u_e and v_e are the startpoint and the endpoint of the edge e, and the remaining 4 integers describe the linear functions for the upper and lower bound of circulation.

It is guaranteed that for any $t \in [0, 1]$ and for any edge $e \in E$ the following condition holds $0 \leq l_e(t) \leq r_e(t) \leq 10^4$.

Output

Print a single real integer — the probability of existence of lr-circulation in the graph, given that t is chosen uniformly at random from the segment [0, 1]. Your answer is considered correct if its absolute difference from jury's answer is not greater than 10^{-6}.

Example

input

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3 3
1 2 0 3 -4 7
2 3 -2 5 1 6
3 1 0 4 0 4
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output

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0.25
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Note

In the first example the conservation condition allows only circulations with equal values f_e for all three edges. The value of circulation on the last edge should be 4 whatever t is chosen, so the probability is

$$P(4 \in [3, -4t+7] \ \& \ 4 \in [-2t+5, t+6]) = 0.25$$