# 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 $l_e \le f_e \le r_e$ 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 $n$, $m$ ($1 \le n \le 1000$, $1 \le m \le 2000$).

Each of the next $m$ lines describes edges of the graph in the format $u_e$, $v_e$, $a_e$, $b_e$, $c_e$, $d_e$ ($1 \le u_e, v_e \le n$, $-10^4 \le a_e, c_e \le 10^4$, $0 \le b_e, d_e \le 10^4$), 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 $0 \le l_e(t) \le r_e(t) \le 10^4$.

### 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**

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

**output**

```
0.25
```

## 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

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