# Problem M. Minimal Variance Tree

| | |
|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 1 second |
| Memory limit: | 256 mebibytes |

Sophie learned today that the notion of variance can be extended to edge-weighted trees: given a tree with edges $E$ this is a sum (over $E$) of squared differences between the weights of the edges and the mean weight of the edges. She was able to come up with a formula for that: if $w_e$ denotes the weight of the edge $e$ then the variance of the tree is

$$\sum_{e \in E} (w_e - S_T)^2, \text{ where } S_T = \sum_{e \in E} \frac{w_e}{|E|} \ .$$

Sophie wonders, whether for a given multigraph she can compute its spanning tree with the smallest variance. Help her in this task.

## Input

First line of the input contains two positive integers $n$ and $m$ ($2 \le n \le 10\,000$, $1 \le m \le 10\,000$), denoting the number of vertices and edges of the graph. Each of the following $m$ lines contains three positive integers $a_i$, $b_i$ and $w_i$ ($1 \le a, b \le n$, $a \ne b$, $1 \le w \le 100\,000$), this is the description of the $i$th edge, which connects the vertices $a_i$ and $b_i$ and has the weight $w_i$.

The described graph is connected, it can have many edges between any two vertices, those edges can have different weights.

## Output

You should one real number: minimal value of variance of a spanning tree of the given graph. The answer is accepted if the relative or absolute error is at most $10^{-6}$.

## Example

| standard input | standard output |
|---|---|
| 4 6<br>1 2 3<br>2 3 9<br>3 4 7<br>1 3 5<br>1 3 6<br>4 1 2 | 4.666666667 |