

Problem A: Density index

Advanced Algorithms for Programming Contests

Restrictions

Time: 2 seconds

Memory: 512 MB

Problem description

We define the density index of a connected undirected graph as the reciprocal of the average pairwise distance between distinct vertices in it, s.t. it is 1 if and only if the graph is complete, $\frac{1}{2}$ if the average distance is 2 etc.

Your job is to write a program that can determine the density index of any connected undirected graph.

Input

The input consists of

- one line containing N and M ($2 \leq N \leq 10^3$, $N - 1 \leq M \leq 10^4$) – the numbers of vertices and edges in the graph
- M lines each containing two numbers u, v ($1 \leq u, v \leq N$) – indicating an edge connecting vertices u and v .

It is guaranteed that the given graph is connected.

Output

Output the graph's density index with a precision of at least 10^{-4} .

Sample input and output

Input	Output
5 5 1 2 2 3 3 4 5 3 1 5	0.625000