GRAPH

1s

Consider an undirected connected graph with n vertices and m edges. The vertices are numbered from 1 to n and the edges are numbered from 1 to m. Baby Peashooter performs a random walk on the graph. Initially, Peashooter is at vertex 1. At each step, Peashooter randomly chooses an edge of the current vertex with equal probability, and walks along this edge to the next vertex, obtaining a point that is the index number of this edge. The walk ends when Peashooter reaches vertex n, and the total score is the sum of all points obtained.

Find the minimal expected value of Peashooter total score across all possible numberings of the m edges.

INPUT

The first line contains two integers representing the number of vertices n and edges m of the graph ($2 <= n <= 500$).

Each of the next m lines contains two integers u, v, indicating that there is an edge between two vertices u and v ($1 <= u, v <= n$).

It is guaranteed that the graph is connected and contains no self-loops or multi-edges.

OUTPUT

Print a single real number representing the answer, with exactly three decimal places.

Sample Input	Sample Output
3 3 2 3 1 2 1 3	3.333

EXPLANATION

Edge (1,2) is numbered 1, edge (1,3) is numbered 2, edge (2,3) is numbered 3.