B - 旅行 / Journey

Time limit : 2sec / Memory limit : 1024MB

Score : 100 points

Problem Statement

There are N towns and M roads, each connecting two towns. The towns are numbered 1 through N, and the i-th road connects Town p_i and Town q_i ($p_i < q_i$). These roads are monodirectional, and for each road, you can only travel from the town with the smaller ID (Town p_i) to the town with the larger ID (Town q_i).

You are now at Town 1. You will go on a journey as follows:

- If there is no road going out of the current town, finish the journey.
- If there are some roads going out of the current town, choose one of those roads with equal probability and go along that road.

You will repeat this move until the journey is finished. Find the probability that you finish the journey at Town N.

Constraints

- $1 \leq N \leq 100\ 000$
- $1 \leq M \leq 200\ 000$
- $1 \leq p_i < q_i \leq N$
- $(p_i, q_i) \neq (p_j, q_j)$ $(i \neq j)$

Input

Input is given from Standard Input in the following format:

$$
\begin{array}{ll}
N & M \\
p_1 & q_1 \\
\vdots & \\
p_M & q_M
\end{array}
$$

Output

Print the probability that you finish the journey at Town N. The output is considered correct if the absolute or relative error from the judge's output is at most 10^{-6}.

Remain

Sample Input 1

Copy

```
5 3
1 5
1 2
3 5
```

Sample Output 1

Copy

```
0.500000000000
```

There are two roads going out of Town 1. If the road leading to Town 5 is chosen, the journey will be finished at Town 5, but if the road leading to Town 2 is chosen, the journey will be finished at Town 2. Thus, the journey is finished at Town 5 with probability $1/2$.

Sample Input 2

Copy

```
10 12
2 7
3 7
5 10
3 5
5 8
5 9
4 5
5 6
1 2
4 8
2 3
9 10
```

Sample Output 2

Copy

```
0.125000000000
```

Sample Input 3

Copy

```
2 1
1 2
```

Sample Output 3

Copy

```
1.000000000000
```

Submit