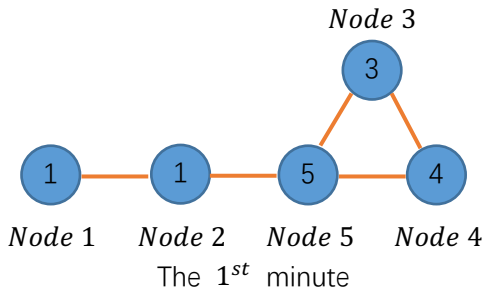
Problem I. Colored Nodes

Description

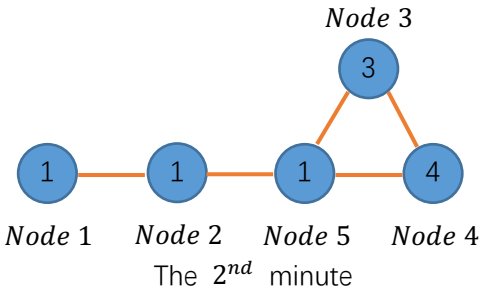
There are N colored nodes, numbered from 1 to N. Initially, the color of $Node\ i$ is $Color\ i$. There are M edges between some pairs of nodes.

At the beginning of the $(i+kN)^{th}$ minute, the colors of the nodes that adjacent to $Node\ i$ will be set to the same color as $Node\ i$, where k is a non-negative integer.

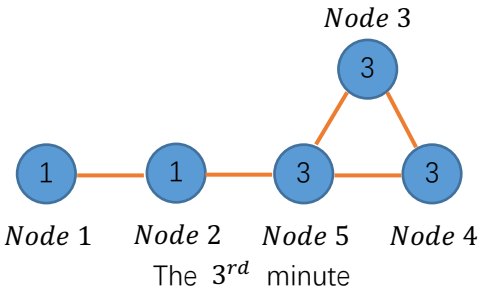
The following pictures are examples.



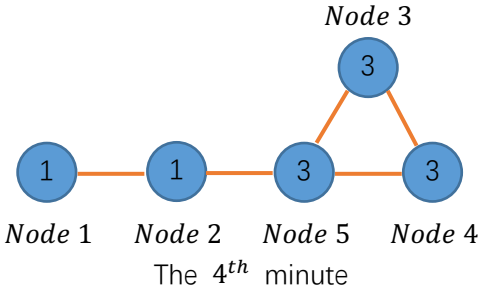
The 1^{st} minute



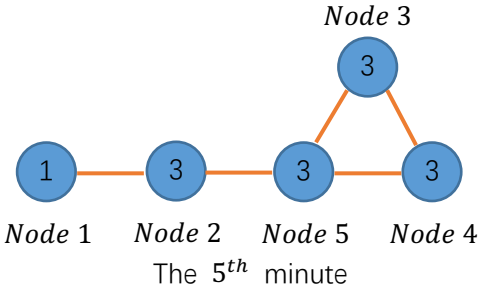
The 2^{nd} minute



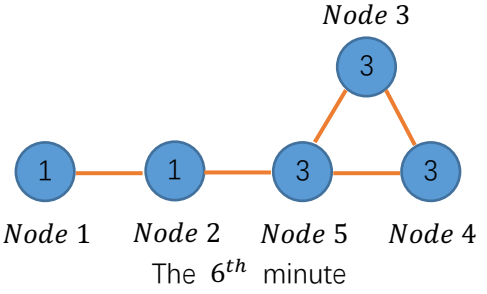
The 3^{rd} minute



The 4^{th} minute



The 5^{th} minute



The 6^{th} minute

At the beginning of the 1^{st} minute, the color of $Node\ 2$ is set to 1.

At the beginning of the 2^{nd} minute, the color of $Node\ 1$ and 5 is set to 1.

At the beginning of the 3^{rd} minute, the color of $Node\ 4$ and 5 is set to 3.

At the beginning of the 4^{th} minute, the color of $Node\ 3$ and 5 is set to 3.

At the beginning of the 5^{th} minute, the color of $Node\ 2$, 3 and 4 is set to 3.

At the beginning of the 6^{th} minute, the color of $Node\ 2$ is set to 1.

……

Assume the number of nodes that are color i during the j^{th} minute is $D(i,j)$. And assume

$$F(i) = \lim_{n\to\infty} \frac{1}{n} \sum_{j=1}^{n} D(i,j)$$

Your task is to calculate $F(i)$ for all i range from 1 to N.

Input

The input consists of multiple test cases. (Up to 20)

For each test case:

The first line contains two integers N and M, indicating the number of nodes and the number of edges. $(1 \le N, M \le 10^5)$

M lines follow, each line contains two integers a and b, indicating that there is an edge between $Node\ a$ and $Node\ b$. $(1 \le a, b \le N)$

Output

For each test case, output all $F(i)$ that satisfy $F(i) \neq 0$, rounded to six decimal places and sorted in descending order.

Sample Input

5 5
1 2
2 5
3 4
4 5
3 5
5 4
1 2
2 5
5 4
4 3

Sample Output

3.000000
2.000000
2.800000
2.200000