

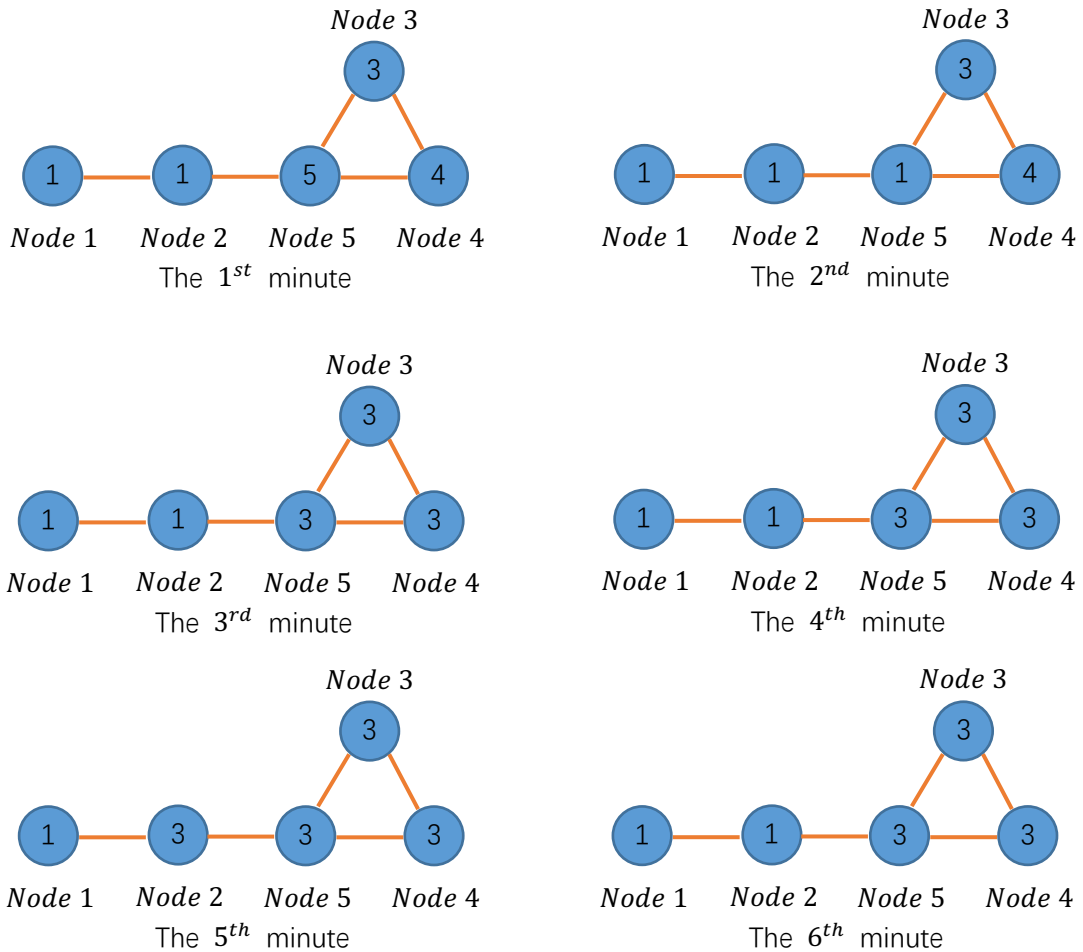
# Problem I. Colored Nodes

## 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.



- At the beginning of the 1<sup>st</sup> minute, the color of *Node* 2 is set to 1.
- At the beginning of the 2<sup>nd</sup> minute, the color of *Node* 1 and 5 is set to 1.
- At the beginning of the 3<sup>rd</sup> minute, the color of *Node* 4 and 5 is set to 3.
- At the beginning of the 4<sup>th</sup> minute, the color of *Node* 3 and 5 is set to 3.
- At the beginning of the 5<sup>th</sup> minute, the color of *Node* 2, 3 and 4 is set to 3.
- At the beginning of the 6<sup>th</sup> 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

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

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. ( $1 \leq N, M \leq 10^5$ )

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

## 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
```