

Problem Mán lì

Input file `stdin`
Output file `stdout`

There are N participants at 插入编程竞赛 which need to be accommodated in a hotel with N available rooms.

Among these participants there are exactly M friendships. If two participants are friends, then they can be assigned to the same room. Otherwise, they must be assigned to different rooms.

Find the lexicographically minimum assignment of the N participants to the N available rooms of the hotel. We can show that such an assignment always exists.

An assignment A_1, A_2, \dots, A_N is lexicographically smaller than another assignment B_1, B_2, \dots, B_N if there exists a position $1 \leq i \leq N$ for which:

- $A_j = B_j$, for all $1 \leq j < i$.
- $A_i < B_i$.

Here, A_i denotes the number of the room assigned to the i -th participant in the first assignment. Similarly, B_i denotes the number of the room assigned to the i -th participant in the second assignment.

Input

The first line of input contains integers N and M - the number of participants, and the number of friendships, respectively.

Each of the next M lines of input contains two integers U_i and V_i ($1 \leq U_i, V_i \leq N$, $U_i \neq V_i$), meaning that participants U_i and V_i are friends. Note that this relationship is bidirectional.

Output

Print the lexicographically minimum assignment A_1, A_2, \dots, A_N ($1 \leq A_i \leq N$ for all i). We can show that such an assignment always exists.

Restrictions

- $1 \leq N \leq 300\,000$
- $0 \leq M \leq \min\left(\frac{n(n-1)}{2}, 300\,000\right)$
- $1 \leq U_i, V_i \leq N$, $U_i \neq V_i$ for all $1 \leq i \leq M$.
- It is guaranteed that all friendships given in the input are pairwise distinct.

#	Points	Restrictions
1	14	$1 \leq N \leq 7$
2	19	$1 \leq N \leq 3\,000$
3	31	$1 \leq M \leq 3\,000$
4	36	No additional restrictions.

Examples

Input file	Output file	Explanations
<pre>6 4 1 4 1 5 3 5 6 2</pre>	<pre>1 2 3 1 3 2</pre>	<p>Participant 1 is assigned to room 1.</p> <p>Participant 2 is assigned to room 2.</p> <p>Participant 3 is assigned to room 3.</p> <p>Participant 4 is assigned to room 1.</p> <p>Participant 5 is assigned to room 3.</p> <p>Participant 6 is assigned to room 2.</p> <p>For example, since participants 1 and 4 are friends, they can be assigned to the same room.</p> <p>We can show that, under the given constraints, this is the lexicographically minimum assignment.</p>
<pre>4 6 1 2 1 3 1 4 2 3 2 4 3 4</pre>	<pre>1 1 1 1</pre>	<p>Here, all of the participants are friends with each other. Therefore, they can all be assigned to room 1.</p>