

# Colorful Graph

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            3 seconds  
Memory limit:         1024 megabytes

Given an undirected graph with  $n$  vertices and  $m$  edges, you need to paint each edge with one of the  $m$  colors, such that for any vertex  $u$  and any color  $c$ , at most 2 edges connecting vertex  $u$  are painted with color  $c$ .

More formally, for all integers  $1 \leq u \leq n$ , the following constraint must be satisfied: let  $d_u$  be the number of edges connecting vertex  $u$ , let  $e_{u,1}, e_{u,2}, \dots, e_{u,d_u}$  be these edges, and let  $w(e)$  be the color of edge  $e$  (colors are numbered from 1 to  $m$ ). Then, for all integers  $1 \leq c \leq m$ ,  $c$  appears at most twice in the sequence  $w(e_{u,1}), w(e_{u,2}), \dots, w(e_{u,d_u})$ .

Let  $f_u$  be the number of different colors on all edges connecting vertex  $u$ . Find a way to paint the edges and minimize  $\sum_{u=1}^n f_u$ .

## Input

There are multiple test cases. The first line of the input contains an integer  $T$  ( $1 \leq T \leq 10^4$ ) indicating the number of test cases. For each test case:

The first line contains two integers  $n$  and  $m$  ( $2 \leq n \leq 2 \times 10^5$ ,  $1 \leq m \leq \min(\frac{n(n-1)}{2}, 2 \times 10^5)$ ), indicating the number of vertices and the number of edges in the graph.

For the following  $m$  lines, the  $i$ -th line contains two integers  $u_i$  and  $v_i$  ( $1 \leq u_i, v_i \leq n$ ), indicating that the  $i$ -th edge connects vertices  $u_i$  and  $v_i$ .

It's guaranteed that there are no self loops or multiple edges in the graph. However, the given graph might not be connected. It's also guaranteed that neither the sum of  $n$  nor the sum of  $m$  of all test cases will exceed  $2 \times 10^5$ .

## Output

For each test case, output one line containing  $m$  integers  $w_1, w_2, \dots, w_m$  ( $1 \leq w_i \leq m$ ) separated by a space, where  $w_i$  is the color painted on the  $i$ -th edge.

If there are multiple valid answers, you can output any of them.

## Example

standard input	standard output
2	2 2 3 3 2 3 6
5 7	2 1
1 5	
2 5	
3 5	
4 5	
1 2	
3 4	
3 1	
4 2	
1 2	
3 4	