

Only Shallow

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 1024 megabytes

Jump Trading plans to carry out High-Frequency Trading(HFT) using a network of servers scattered around the globe.

A network consists of N servers and M communication links. Each server is identified using an integer number from 1 to N , and each communication link is identified using an integer number from 1 to M . There is at most one communication link directly connecting any given pair of servers, and interestingly, transactions using a communication link can only be made in one direction. Initially, the direction of each communication link is not set, and without considering the directions, all servers are connected directly or indirectly by one or more communication links.

Minimizing network delay is a crucial component of High-Frequency Trading. To achieve this task, Jump Trading wishes to set the directions of all communication links to configure the network for a low transmission depth. The resulting network must meet the following condition.

- For each server, the number of servers which can be reached directly or indirectly using one or more communication links is less than or equal to 2.

Determine if a suitable network configuration exists, and if it does, construct it.

Input

The first line contains an integer T , the number of test cases. ($1 \leq T \leq 100$)

The first line of input for each test case contains N , denoting the number of servers, and M , denoting the number of communication links, separated by a space. ($2 \leq N \leq 1000$; $1 \leq M \leq 2000$)

The i -th of the following M lines contains two space-separated integers U_i , and V_i , denoting the server numbers of the two servers connected by the i -th communication link. ($1 \leq U_i, V_i \leq N$; $U_i \neq V_i$)

There is at most one communication link which directly connects any given pair of servers, and if you ignore the directions, all servers are connected directly or indirectly by one or more communication links.

Output

For each test case, print T lines in order.

For each test case, if a suitable network configuration does not exist, print -1 .

If it is possible to configure a network which meets the condition, print M space-separated integers. The i -th integer should be 0 if the direction of the i -th communication link is set to be forward ($U_i \rightarrow V_i$), and 1 if backward ($V_i \rightarrow U_i$). Any suitable network configuration is accepted as an answer as long as it meets the condition given in the problem statement.

Examples

standard input	standard output
3 3 3 1 2 2 3 3 1 4 4 1 2 2 3 3 4 4 1 5 5 1 2 2 3 3 4 4 5 5 1	1 1 1 0 1 0 1 -1
1 4 5 1 2 1 3 1 4 2 4 3 4	1 1 0 0 0
1 12 12 1 2 2 3 3 1 1 4 1 5 2 6 2 7 1 8 8 9 9 10 10 11 10 12	1 1 0 1 1 1 1 1 0 1 1 1