
ACM Programming Challenges Lab

Exercise 1 – *Message of the Day*

Your company has decided that it wants a single application to handle all the company's communication needs. The somewhat ill-advised design that they came up with is the following: there is a single computer on the internal company network, which is called the *master node*. Every morning at 8:00, the master node reads whatever text is stored in a local file called `motd`, and its task is to transmit the *message of the day* to every other computer.

Two computers on the network can transmit data between each other, only if they are *connected* with a network cable. The network is designed in such way, that as soon as a computer receives a message, it instantly transmits the message to all computers it is connected to. A transmission between two computers always lasts *exactly* one second.

The company management is convinced that this new technology will revolutionize the working place. The only question that they couldn't agree on is which computer should be the master node. After many long meetings, they have agreed that the master node should be chosen such that the moment at which the last computer on the network receives the text is as early as possible. You have been assigned the important job of finding this computer.

The computers are labeled with numbers from 1 to n . In case there is more than one choice for the master node, you should output the one with the *smallest* label.

Input The first line of the input contains the number $t \leq 50$ of test cases. Each of the t test cases is described as follows.

- It starts with a line that contains two integers n m , separated by a space and such that $1 \leq n \leq 2000$ and $0 \leq m \leq 2000$. Numbers n and m represent the number of computers and the number of connections, respectively.
- The following m lines define connections. Each connection is defined by two integers u v , separated by space and such that $u, v \in \{1, \dots, n\}$ and $u \neq v$, which indicates that the computers with label u and v are connected.

You may assume that it is possible for the message of the day to reach all computers, no matter the choice of the master node.

Output For each test case, your program should output a line that contains the label of the computer, selected to be the master node.

Points There are two groups of test sets, worth 100 points in total.

1. For the first group of test cases, worth 50 points, you may assume that $m = n - 1$.
2. For the second group of test cases, worth 50 points, there are no additional assumptions.

Sample Input

2
5 4
1 2
1 3
2 4
2 5
9 9
1 2
2 3
3 4
4 5
5 6
6 3
6 7
5 8
4 9

Sample Output

1
3