Consultants

Pål and Markus just started a consulting company and have employed a bunch of computer scientists. The only detail missing, is clients. They realize that a good way of getting companies as clients is to get someone who previously worked there to convince them. Hence, they sit down and make a long list of companies they would love to have as clients. Then they dig up all of the applications of the newly hired consultants and starts to list for each consultat their former employers.

One recruiting visit takes a full day of work and Pål and Markus want all of the companies to be visited as soon as possible. You are given the task of deciding which consultants that should travel to the various companies at the list and when. By the number of companies you immediately conclude that you will have to write a computer program to make the decisions.

Input

The input has $n \leq 200$ cases, and the first line consists of a positive integer giving n. The first line for each test case consists of two positive integers separated by a single space, $m \leq 100$ and $f \leq 50$, where m denotes the number of companies listed, and f the number of consultants.

Then follow f lines. Line number i represents consultant i. The line starts with a positive integer giving the number of former employers the consultant has. Then follows a list of space separated unique integers naming these companies. The companies are numbered from 0 to $m - 1$.

Output

Output one line for each test case. If it is impossible to visit all companies you should output "impossible". Otherwise output a line with a single integer giving the minimum number of days needed to make sure all companies are visited by a consultant.

Sample Input 1	Sample Output 1
3 3 3 1 0 1 0 2 1 2 5 3 5 4 3 2 1 0 1 0 2 0 1 3 2 1 0 2 0 1	2 3 impossible