AlgoWahr - SS20

Important Stops

Handout: 5. März 2020 17:00

Due: 12. März 2020 10:00

Important Stops

Open Task

Important Stops

You were hired by Swiss Federal Railways to do an important job. Given a map with n cities, denoted by $\{0, 1, \ldots, n-1\}$, and a map of *bi-directional* rail segments between them, your task is to decide at which stops should the passengers be checked if they have a valid ticket. Since each city has its corresponding unique stop, we refer to stops and cities interchangeably. The process of ticket control takes time and human resources, thus SBB decided that the passengers should be checked at a stop (city) i only if the stop is *very important*. A stop $a \in \{0, \ldots, n-1\}$ is very important if there exist two different cities $b, c \in \{0, \ldots, n-1\} \setminus \{a\}$ such that the following is satisfied:

- city b is reachable by train from city c (and the other way around), and
- for a train to go from city b to city c it must go through city a.

Input

The first line of the input contains the number $t \leq 20$ of test cases. Each of the t test cases is described as follows.

- It starts with a line containing two integers `n m`, separated by a space, denoting the number of stops ($1 \leq n \leq 10^4$) and the number of rail segments ($1 \leq m \leq 10^4$).
- The next m lines each consist of two integers `a b`, separated by a space, denoting that there is a rail segment between a and b (where $0 \leq a \neq b \leq n-1$).

Output

For each test case output one line containing the id's of all the *very important* stops (cities) separated by space and sorted by the increasing value of the id. In case there are no important stops for a particular test case, output `-1`.

Points

There is one group of test sets worth 100 points in total.