# Building Bubblers

Filenames: *bubblers*, *bubblers_small* (for partial credit)
Time limit: *15 seconds*

David, the best bubbler builder in Brookfield, has just gotten a job at the new high-tech drinking fountain startup Max Flow Inc. As his first assignment, David has been tasked with designing a prototype bubbler in such a way that water can freely flow between the bubbler's n sensors. Max Flow Inc. has m different pipes at its factory that David can use. The $i^{th}$ one can be used to connect sensors $a_i$ and $b_i$, and, if David requests it now, would be delivered at minute $c_i$ after which time David could begin installing it. Water can flow between a pair of sensors if there is a series of one or more pipes connecting them.

The only problem is that David's pipe work is, well, rusty. It takes him one minute to install a pipe, and he can only install one pipe each minute. Obviously, he can't begin installing a pipe until he gets it. So, if David receives the pipes he needs at minutes 2, 6 and 6, he could install them at minutes 3, 7, and 8, finishing the prototype in 8 minutes.

How soon (if ever) can David finish his assignment? That is, how much time does he need to receive and install pipes to allow water to flow between all pairs of sensors?


An illustration of the first sample, with one optimal solution highlighted in red. David can install the highlighted pipes at times 3, 4, 6, 7, 12, and 13, to complete the bubbler in 13 minutes. Other optimal solutions exist, but none take less than 13 minutes.

## The Problem

Given when each of the pipes becomes available, determine the minimum amount of time it will take David to get water flow between all pairs of sensors, or determine that the task is not possible.

**The Input**
The first line of input will contain a single positive integer, $c$ ($c \leq 100$), representing the number of input cases to process. The input cases follow. The first line of each input case will contain two integers $n$ ($2 \leq n \leq 3*10^5$), the number of sensors in the bubbler, and $m$ ($1 \leq m \leq 3*10^5$), the number of pipes David can request. $m$ lines follow, describing the available pipes. The $i^{th}$ of these lines contains three integers $a_i$ ($1 \leq a_i \leq n$), $b_i$ ($1 \leq b_i \leq n$), and $c_i$ ($0 \leq c_i \leq 10^9$), representing that the $i^{th}$ pipe can connect sensors $a_i$ and $b_i$ ($a_i \neq b_i$) and that David receives the pipe at time $c_i$. Sensors are numbered from 1 to n. No two pipes will connect the same pair of sensors, and $n$ will exceed 1000 in at most 15 cases.

**Partial Credit Input (50%)**
All of the given values for $c_i$, the time at which pipe i will be available, will be equal to 0.

**The Output**
For each input case, on a line by itself, print a single integer: the amount of time David needs in order to receive and install pipes that connect all sensors, or -1 if David can't ever get enough pipes to complete the bubbler.

**Sample Input**
```
3
6 8
6 2 3
6 4 15
6 5 5
1 4 11
1 5 11
2 3 11
2 4 2
4 5 5
5 5
1 2 1
2 3 1
2 5 7
3 4 1
1 5 2
4 3
1 2 3
1 3 3
2 3 3
```

**Sample Output**
```
13
5
-1
```

Note: None of these sample cases are valid cases for the partial credit input. As previously stated, all values of c will be 0 in the partial input credit cases.