Conquering Cities

Time Limit per test file: 2 seconds
Memory Limit per test file: 256 megabytes

There exists a kingdom with **N** cities. The evil emperor wishes to rule it. With the help of those who oppose the current ruler, he has managed to take over the capital, which is city number **0**. In this kingdom however, if a city (**u**) receives help (like food, artillery, etc) from any other city (**v**), then **u** cannot be taken over or conquered. It is obvious that if a city is taken over by the evil emperor, then that city will not help any other city fight against the evil emperor.

The capital is at level **0**. A city, **u**, is said to be at level **i** if maximum level of any city, **v**, it receives help from is **i - 1**. To capture a city at the **i**th level, the evil emperor incurs a cost equal to the **i**th prime number. What is the total cost that the evil emperor incurs?

Also, there may be cases when all the cities cannot be captured. This happens when there exists a cycle of cities that help each other.

Input:
The first line of input contains a single integer, **T**, indicating the number of test cases.
The first line of each test case contains two integers, **N** and **M** where **N** denotes the number of cities and **M**, the number of helping relations.
This is followed by **M** lines where each line contains two space separated integers, **u** and **v**. This denotes that **u** receives help from **v**.

Output:
A single integer for each test case (on a new line) which is the total cost that the evil emperor incurs. But, if all the cities cannot be conquered, output the message **"evil emperor loses"** (without double quotes).

Constraints:
$$1 \leq T \leq 13$$
$$1 \leq N, M \leq 5 * 10^5$$
$$0 \leq u, v \leq N-1$$

Sample Input:
1
4 4
1 0
2 0
2 1
3 1

Sample Output:
8