

C Road Construction

TIME LIMIT: 1.0s
MEMORY LIMIT: 256MB

You are given n cities labeled $1..n$ and m road construction events. Each event adds a single undirected road between two cities. After each road is added, report:

1. the current number of connected components, and 2. the size of the largest connected component.

Multiple roads between the same pair of cities may appear; they do not change connectivity once the endpoints are already connected.

Input

- The first line contains an integer T , the number of test cases.
- For each test case:
 - The first line contains two integers n and m .
 - The next m lines each contain two integers a and b , indicating a road added between cities a and b .
- $1 \leq T \leq 2 \cdot 1000$
- $1 \leq n, m \leq 2 \cdot 10^5$ per test case
- $\sum n \leq 2 \cdot 10^5, \sum m \leq 2 \cdot 10^5$
- $1 \leq a, b \leq n$

Output

For each test case, print m lines. After each road addition, output two integers: the number of connected components and the size of the largest connected component.

Samples

Sample input 1	Sample output 1
1 5 3 1 2 1 3 4 5	4 2 3 3 2 3

Sample input 2	Sample output 2
2 3 2 1 2 2 3 4 1 1 4	2 2 1 3 3 2

Scoring

- 10%: sample tests.
- 30%: $n \leq 20, m \leq 40$.
- 30%: $n, m \leq 10^3$.
- 30%: $n, m \leq 10^5$.