edge initially.

Then you will be given m undirected edges. Add the edges to the graph sequentially.

After each addition of edge, calculate the number of connected components in the graph and the size of the largest connected component.

It is guaranteed that the graph remains simple (no multiple edge, no self-loop) after each addition of edge.

Note that:

- A *connected component* of an undirected graph is a *connected* subgraph that is not part of any larger *connected* subgraph.
- An isolated vertex which can not reached by any other vertices should be considered as one *connected component*.

Input

The first line of the input contains two integers n and m — the number of vertices and the number of edges. The vertices are denoted by $1, 2, ..., n$.

Then m lines follow, each line contains two integers u and v, being an edge to add.

Constraints

- $2 \leq n \leq 10^5$
- $1 \leq m \leq min(\frac{n(n-1)}{2}, 2 \times 10^5)$
- $1 \leq u, v \leq n$; $u \neq v$

Output

For each addition of edge, output one line: the number of connected components in the graph and the size of the largest connected component.

Sample Input 1

```
5 3
1 2
1 3
4 5
```

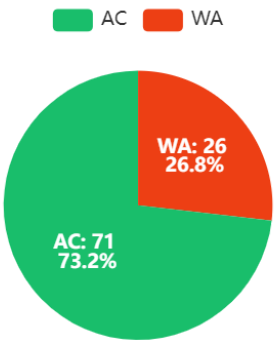
Sample Output 1

```
4 2
3 3
2 3
```


Information

ID	1
Time Limit	1000MS
Memory Limit	256MB
IO Mode	Standard IO
Created By	ta_david
Level	Hidden
Score	100
Tags	Show

Statistic Details



You have solved the problem

Submit for Sample Test

Submit

Contest has ended

Sample Test Input

```
5 3
1 2
1 3
4 5
```

Sample Test Output