Problem N
Server Connectivity
Time limit: 10 seconds

For a graph $G = (V, E)$ and a subset $S \subseteq V$, we use $G[S]$ to denote the subgraph of G *induced* by S, which is the graph obtained from G by removing all vertices not in S and their incident edges. For instance, for the graph $G = (V, E)$ in Figure 1, where $V = \{1, 2, ..., 7\}$ and $E = \{(7, 2), (1, 3), (2, 4), (5, 1), (2, 6)\}$ and $S = \{2, 4, 7\}$, we have $G[S] = (V', E')$, where $V' = \{2, 4, 7\}$ and $E' = \{(7, 2), (2, 4)\}$ (See Figure 2). For a graph $G = (V, E)$, we say that G is *connected* if there is a path between every pair of vertices $u, v \in V$. For example, the graph in Figure 1 is not connected, while the graph in Figure 2 is connected.

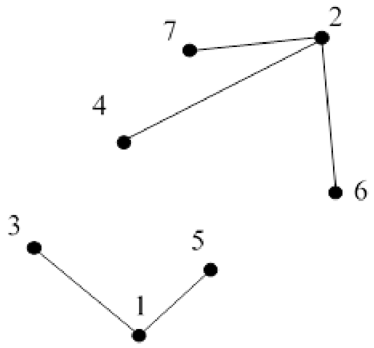

Figure 3: G

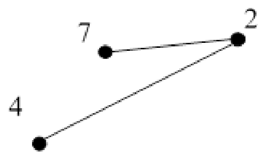

Figure 4: $G[S]$

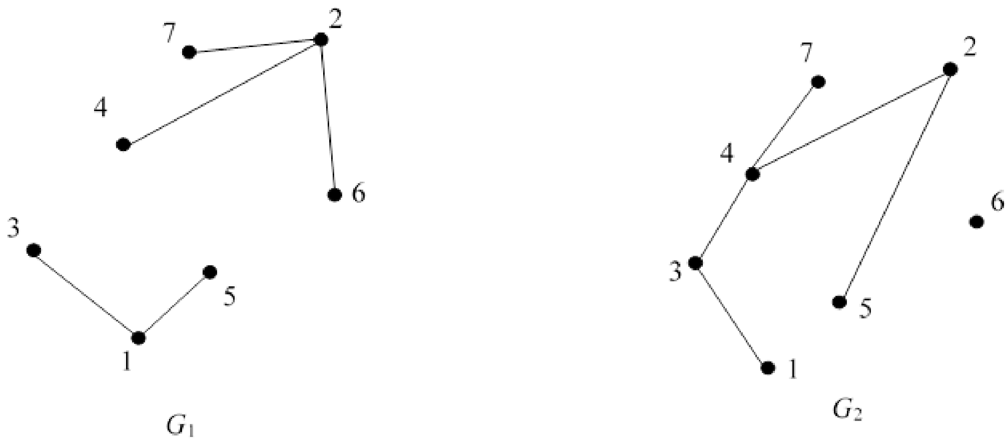

Figure 5: G_1 and G_2

A software company has a set of servers around the world to handle their global service. The servers are linked to each other by two types of connections, where connections of each type form a network that contains no cycles. These two networks are represented by two graphs $G_1 = (V, E_1)$ and $G_2 = (V, E_2)$, where V is the set of servers and E_1 (E_2) is the set of connections of type 1 (type 2). The owner wishes to solve a problem described as follows. A subset $S \subseteq V$ is a *common connected component* if $G_1[S]$ and $G_2[S]$ are both connected. For instance, in Figure 3, $S = \{2, 4, 7\}$ is a common connected component of G_1 and G_2, but $S' = \{4, 7\}$ is not. A common connected component S is *maximal* if it is not contained in a larger common connected component. For example, in Figure 3, $S = \{2, 4, 7\}$ and $S'' = \{2, 4\}$ are both common connected components. In this example, S is maximal, but S'' is not. For the example in Figure 3, the set of maximal components is {{2, 7, 4}, {1, 3}, {5}, {6}}. It is easy to observe that the set of maximal common connected components is unique and represents a partition of the vertex set.

Please write a program to find the number of maximal common connected components and the size of the largest common connected component of two given graphs G_1 and G_2.

Technical Specification

- The number of test cases is at most 25.
- The number, n, of vertices is an integer between 1 and 2×10^5.
- The vertex set is $V = \{1, 2, ..., n\}$.
- G_1 and G_2 are (undirected) graphs with no cycles.

Input File Format

The first line of the input is an integer t, indicating there are t test cases. The first line of each test case gives 3 integers n, m_1, and m_2, where n is the number of vertices and m_1 (m_2) is the number of edges in G_1 (G_2). Then, $m_1 + m_2$ lines follow, where the first m_1 lines give the edges of G_1, the remaining lines give the edges of G_2, and each line contains two integers i and j ($1 \le i$, $j \le n$), indicating there is an edge connecting vertex i and vertex j.

Output Format

For each case, output two integers in a line, where the first is the number of maximal common connected component and the second is the size of the largest common connected component. For the example in Figure 3, the output is 4 and 3.

Sample Input

```
3
7 5 5
7 2
2 4
1 3
2 6
5 1
3 4
2 5
3 1
4 2
7 4
3 2 2
1 2
2 3
1 3
3 2
4 3 2
1 2
1 4
1 3
3 4
2 4
```

Output for the Sample Input

```
4 3
1 3
4 1
```