Atod Clusters

Problem Statement

In the mystical world of Atod, Invoker and Puck took a momentary respite from their intense battles to gaze at the stars. They numbered each radiant star from 1 to N.

Whenever Invoker pointed at a star and called out its number, Puck would respond by identifying another. Utilizing their arcane powers, they conjured magical lines connecting these stars. By the end of their celestial diversion, a tapestry of intricate patterns had emerged. They named these patterns Atod Clusters. Stars that remained untouched and solitary were also considered as individual Atod Clusters.

The challenge now is to quickly determine how many connections each Atod Cluster comprises.

Two stars are considered to be in the same Atod Cluster if they are connected either directly or through other stars.

Input

The first row contains two integers separated by a space: N and M — the number of stars in the sky and the number of magical connections drawn, respectively. The subsequent M rows contain two integers each: A_i, B_i — representing the star number Invoker identified and the star number Puck pointed out.

Output

1. The integer K — representing the total number of Atod Clusters formed.
2. The subsequent K rows should list the number of connections each Atod Cluster has, in non-descending order.

Constraints

$$1 \leq N, M \leq 10^4$$
$$1 \leq A_i, B_i \leq N$$
$$A_i \neq B_i$$

Samples

Input	Output
5 3 1 2 2 3 4 5	2 1 2
6 2 1 2 3 4	4 0 0 1 1