Road Spill

There are n cities in the kingdom of king Stofl. All of them were connected by some roads. However, a storm destroyed almost all of them and they might not all be connected anymore.

To restore peace and order Stofl wants to build new roads such that each city can be reached from all other cities (directly or indirectly). To save some money Stofl want to build as *few* roads as possible. What is the minimal number required

Input

The first line contains n, the number of cities, and m, the number of roads which were not destroyed. Afterwards m lines follow, each containing a and b, denoting there is a road between city a and city b.

Output

Print the minimal number of new roads, such that all cities are connected.

Limits

There are 4 test groups. For all it holds $1 \leq n \leq 10^5$ and $0 \leq m \leq 10^5$.

- In test group 1 it holds $n \leq 10$, $m \leq 45$.
- In test group 2 it holds $n \leq 1000$ and $m \leq 1000$.
- In test group 3 it holds $m = 0$.
- In test group 4 there are no further restrictions.

Examples

Input	Output
5 3 0 1 2 3 1 4	1

Stofl could build the road $1 \longleftrightarrow 2$ *and all cities are connected.*

Input	Output
7 6 0 1 0 4 0 5 1 4 4 5 2 6	2

The following two roads would be a solution: $3 \longleftrightarrow 4$ *and* $1 \longleftrightarrow 6$.