Scoreboard

Mouse Sandro enjoys observing the changes in the scoreboard during the contest. During the evening one can hear from him several exclamations of the form "Cool, the mouse on the rank i has advanced to the rank j ".

You know the ranking at the beginning and want to reconstruct the final ranking out of Sandros exclamations.

Input

The first lines consists out of n and q, the number of mice and queries (exclamations). You may assume that the ranking is sorted at the beginning which means that mouse i is on rank i.

There will follow q lines with two numbers i and j which means that the mouse on rank i is now on rank j. Note that it is possible that $i < j$ that is that the rank has declined (e.g. because of regrading).

Output

Print the final ranking consisting out of a line with n numbers, separated with spaces.

Limits

- Subtask 1: $n \leq 2, q \leq 100$.
- Subtask 2: $n \leq 10, q \leq 10$.
- Subtask 3: $n \leq 100, q \leq 100$.
- Subtask 4: $n \leq 1000, q \leq 1000$.
- Subtask 5: $n \leq 1000, q \leq 10000$.

Examples

Input	Output
5 5 4 2 3 5 3 1 2 3 1 1	3 4 1 5 2

The ranking changes as following: 12345 → 14235 → 14352 → 31452 → 34152 → 34152.