

B - Connectivity AtCoder - arc065_b 🗷



Problem Statement

There are N cities. There are also K roads and L railways, extending between the cities. The i-th road bidirectionally connects the p_i -th and q_i -th cities, and the i-th railway bidirectionally connects the r_i -th and s_i -th cities. No two roads connect the same pair of cities. Similarly, no two railways connect the same pair of cities.

We will say city A and B are connected by roads if city B is reachable from city A by traversing some number of roads. Here, any city is considered to be connected to itself by roads. We will also define connectivity by railways similarly.

For each city, find the number of the cities connected to that city by both roads and railways.

Constraints

- $2 \le N \le 2 * 10^5$
- $1 \le K, L \le 10^5$
- $1 \leqq p_i, q_i, r_i, s_i \leqq N$
- $p_i < q_i$
- ullet $r_i < s_i$
- When $i \neq j$, $(p_i,q_i) \neq (p_j,q_j)$
- When $i \neq j$, $(r_i, s_i) \neq (r_j, s_j)$

Input

The input is given from Standard Input in the following format:



Output

Print N integers. The i-th of them should represent the number of the cities connected to the i-th city by both roads and railways.

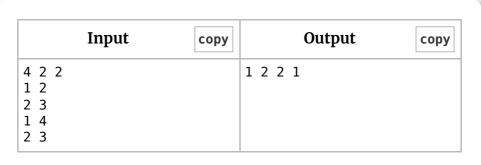
Sample 1

	Input	сору	Output	сору
4 3 1 1 2 2 3 3 4 2 3			1 2 2 1	

All the four cities are connected to each other by roads.

By railways, only the second and third cities are connected. Thus, the answers for the cities are 1, 2, 2 and 1, respectively.

Sample 2



Sample 3





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