Hierarchy

A group of graduated students decided to establish a company; however, they don't agree on who is going to be whose boss.

Generally, one of the students will be the **main** boss, and each of the other students will have exactly one boss (and that boss, if he is not the main boss, will have a boss of his own too). Every boss will have a strictly greater salary than all of his subordinates - therefore, there are no cycles. Therefore, the hierarchy of the company can be represented as a rooted **tree**.

In order to agree on who is going to be who's boss, they've chosen K most successful students, and each of them has given a statement: I want to be the superior of him, him, and him (they could be successful or unsuccessful). And what does it mean to be a superior? It means to be the boss, or to be one of the boss' superiors (therefore, a superior of a student is not necessary his direct boss).

Help this immature company and create a hierarchy that will satisfy all of the successful students' wishes. A solution, not necessary unique, will exist in all of the test data.

Input

In the first line of input, read positive integers N ($N \leq 100\,000$), total number of students, and K ($K < N$), the number of successful students. All students are numbered 1..N, while the successful ones are numbered 1..K.

Then follow K lines. In A^{th} of these lines, first read an integer W (the number of wishes of the student A, $1 \leq W \leq 10$), and then W integers from the range [1, N] which denote students which student A wants to be superior to.

Output

Output N integers. The A^{th} of these integers should be 0 if student A is the main boss, and else it should represent the boss of the student A.

Example

Input:
4 2
1 3
2 3 4

Output:
2
0
1
2

Input:
7 4
2 2 3
1 6

1 7
2 1 2

Output:
4
1
1
0
4
2
3