MAKETREE - Hierarchy

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

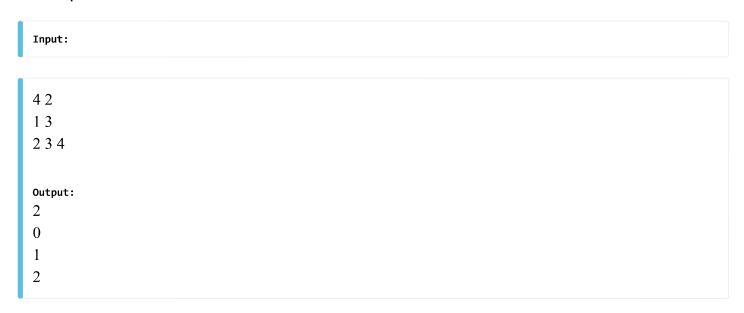
In the first line of input, read positive integers N (N \leq 100 000), total number of students, and K (K < N), the number of successful students. All students are numbered 1..N, while the successful ones are numbered 1..K.

Then follow K lines. In A^{th} of these lines, first read an integer W (the number of wishes of the student A, $1 \le W \le 10$), 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 Ath 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: 7 4 2 2 3 1 6 1 7 2 1 2 Output: 4 1 1 0 4 2 3