Problem E: Election of Evil

Dylan is a corrupt politician trying to steal an election. He has already used a mind-control technique to enslave some set U of government representatives. However, the representatives who will be choosing the winner of the election is a different set V. Dylan is hoping that he does not need to use his mind-control device again, so he is wondering which representatives from V can be convinced to vote for him by representatives from U.

Luckily, representatives can be persuasive people. You have a list of pairs (A, B) of represenatives, which indicate that A can convice B to vote for Dylan. These can work in chains; for instance, if Dylan has mind-controlled A, A can convince B, and B can convince C, then A can effectively convince C as well.

Input

The first line contains a single integer T ($1 \leq T \leq 10$), the number of test cases. The first line of each test case contains three space-separated integers, u, v, and m ($1 \leq u, v, m \leq 10{,}000$). The second line contains a space-separated list of the u names of representatives in U. The third line contains a space-separated list of the v names of representatives from V. Each of the next m lines contains a pair of the form `A B`, where `A` and `B` are names of two representatives such that `A` can convince `B` to vote for Dylan. Names are strings of length between 1 and 10 that only consists of lowercase letters (`a` to `z`).

Output

For each test case, output a space-separated list of the names of representatives from T who can be convinced to vote for Dylan via a chain from S, in alphabetical order.

Sample Input	**Sample Output**
2 1 1 1 alice bob alice bob 5 5 5 adam bob joe jill peter rob peter nicole eve saul harry ron eve adam joe chris jill jack jack saul	bob peter saul

Explanation

In the second test case, Jill can convince Saul via Jack, and Peter was already mind-controlled.