Stable Marriage

In the stable marriage problem, we have two groups of equal size – say N men and N women. Each person ranks all members of the opposite group in order of preference. We must match members of the first group to members of the second group in a "stable" way.

A stable matching means there's no pair of people who would both rather be with each other than with their current partners. If such a better mutual option exists, the system is unstable.

You should write a program to read in the preferences of each group and produce a stable marriage for them.

Input

The first line of input is a number N which gives the number of men and the number of women in the test case. Following that is a blank line, and then N lines giving the ordering for the proposer's preferences (the men in the traditional version of the problem).

Following that is another blank line and then N lines giving the ordering for the proposee's preferences (the women).

Output

Output should consist of N lines giving the stable matching produced. It should contain N lines, with each listing the proposer (man) in order with the proposee (woman) that they are matched with.

Sample Input

```
3

0: 0 1 2
1: 0 1 2
2: 1 0 2

0: 1 0 2
1: 0 1 2
2: 0 1 2
```

Sample Output

```
0: 1
1: 0
2: 2
```