Description

There are N single boys and N single girls waiting to be matched.

Each boy has his own preference order of all N girls, and each girl has her own preference order of all N boys.

As you are a well-known matching master, they wish that you find a **stable matching** for them!
``

Input Format

The first line includes one integer N.

The next line contains N strings separated by spaces, representing the name of boy $1, 2, \ldots, N$ respectively.

The next line contains N strings separated by spaces, representing the name of girl $1, 2, \ldots, N$ respectively.

For the next N lines, line i contains a permutation of N girls' names, representing the preference order of boy i, from passionate to indifferent.

For the next N lines, line i contains a permutation of N boys' names, representing the preference order of girl i, from passionate to indifferent.

It is guaranteed that no two person share a same name.

Output Format

Your program should output N lines.

Each line contains a boy's name and a girl's name separated by a space, representing a pair in the matching. Please output the boy's name before the girl.

You must make sure that your solution is a stable matching.

If there are multiple solution, output any one.

Samples

Sample Input

```
3
A B C
a b c
b a c
b a c
b c a
C B A
B C A
A C B
```

Sample Output

```
A a
B b
C c
```

Limitations & Hints

For 40% testcases:

- $N \leq 100$

For 100% testcases:

- $1 \leq N \leq 1000$
- length of any name is a positive integer no more than 10