Orlando was looking at his soup while his mother was in the kitchen. He was playing with the letters in his soup, and suddenly, he noticed that had a secret power. He could change the words morphing one word to another replacing the letter in a mysterious order.

Orlando has changed the letters of some words, you have to find an algorithm that find out the morphing order from the original word to the morphed one. The rules are simple:

1. In each step you just can change one letter from the previous word.

2. A letter can be changed just once

3. All the letters in the word must change.

## Input

The input is a file containing several unordered morphing series. For each one you have a line with the number of words, the number of letters in each word, next line is the first word, third line is the morphed one. The rest are the intermediate words unordered. The number of words are unlimited and all the words in each set have the same size. You can assume that all the characters are letters (capital or not).

## Output

For each morphing you should print all the words in the correct order to convert the first one in the morphed one

## Sample Input

```
6 5
remar
pitos
remas
remos
retos
ritos
5 4
pato
lisa
pata
pita
pisa
```

## Sample Output

```
remar
remas
remos
retos
ritos
pitos
pato
pata
pita
pisa
lisa
```