Decrypt

Encryption is a method by which messages can be shared secretly.

The earliest form of encryption is the Caesar Cipher, in which letters are shifted cyclically. For example the message "abz" is transmitted as "dec" (each character is shifted 3 units to the right with 'a' following 'z').

Chef knew that such mechanisms are too weak and easily deciphered, so he came up with a better cipher.

Chef proposed to construct a random mapping of characters instead of shifting each character by the same amount.

More specifically Chef created a table, mapping each character to another character in such a manner that

- every character will be mapped to a character other than itself
- no two characters will be mapped to the same character

For example a valid mapping of the first four english alphabets could be 'a' -> 'c', 'd' -> 'b', 'c' -> 'd', 'b' -> 'a'. For this mapping 'bcda' would be encrypted as 'adbc'.

Chef now has given you an encrypted message and has asked you to decipher it. Solve it using a program.

You are given a list of words that Chef knows and every word in the message belongs to this dictionary.

To make the task easy, the English alphabet is reduced to 8 characters, i.e. assume that all characters in the encrypted and decrypted message contain only the characters from 'a' to 'h'.

The output is considered correct if every word in the decrypted message belongs to Chef's dictionary and there exists a valid mapping of characters that decrypts the message.

It is guaranteed that there is always a unique solution.

Input

The first line contains a single integer W

, the number of words that Chef knows

The next W

lines each contain a single word, containing lower case English alphabets from 'a' to 'h'.

The next line contains a message S

(with possibly more than one word), the encrypted message generated by Chef.

Output

Print in a single line, the decrypted message

The decrypted message should correspond to some possible mapping that Chef might have had in mind.

Each word in the decrypted message should belong to Chef's dictionary

Constraints

1≤*W*≤100

1≤|*S*|≤100

1≤

number of words in *S* ≤10

Every word contains only the characters 'a' to 'h'

It is guaranteed that the solution is unique for the input files.

Sample Input

```
5
chef
had
bag
a
big
hdca deg e fib feb
```

Sample Output

```
chef had a big bag
```

Explanation

The given sample input corresponds to the case when chef has the table

'a' -> 'e'

'b' -> 'f'

'c' -> 'h'

'd' -> 'g'

'e' -> 'c'

'f'-> 'a'

'g' -> 'b'

'h' -> 'd'

i.e. whenever chef encounters a character on the left, he replaces it with the character on the right.

Going backwards we can find the decrypted message