Programmer's Poem

Time limit: *2500 ms*
Memory limit: *256 MB*

Programmer's Poem

```
< > ! * ' ' #
^ " ` $ $ -
! * = @ $ _
% * < > ~ # 4
& [ ] . . /
| { , , SYSTEM HALTED
```

The poem above is meant to be read:

Waka waka bang splat tick tick hash

Caret quote back tick dollar dollar dash

Bang splat equal at dollar underscore

Percent splat waka waka tilde number four

Ampersand bracket bracket dot dot slash

Vertical bar curly bracket comma comma CRASH

Challenge

In this challenge, you need to determine the rhyme scheme used by a passage. A rhyme scheme for a passage with n lines is a string of uppercase letters of length n, where the i^{th} letter in the string corresponds to the i^{th} line in the passage. The rules for creating the string are:

1) The lines that rhyme will be labelled with upper-case letters except for `X`.

2) The first set of lines that rhyme should be labelled with an `A`. The second set are labelled with a `B`, and so on, skipping the letter `X`.

3) Lines that do not rhyme with any other line should be labelled with an `x`.

Standard input

The input will begin with two space-separated integers n and m.

Each of the next n lines will contain a list of space-separated words that rhyme. The words will consist of lowercase letters only.

Then there will be a blank line.

The next m lines contain the passage to analyze.

Standard output

Output the rhyme scheme for the passage.

Constraints and notes

- $1 \leq n \leq 100$
- $2 \leq m \leq 50$

Each rhyming group will contain between 1 and 100 words, inclusive.

Each word will be made of between 1 and 15 lower-case letters, inclusive.

No word will appear in more than one group of rhyming words.

Each line of the passage will contain between 1 and 100 words, inclusive. The passage will contain only upper- and lower-case letters.

Comparisons should ignore case.

Two words should only be treated as rhyming, if they appear in the same list of rhyming words.

A word rhymes with itself, if and only if, it appears in one of the lists of rhyming words.

Input	Output	Explanation
2 6 hash dash crash slash underscore four Waka waka bang splat tick Caret quote back tick doll Bang splat equal at dollar Percent splat waka waka ti Ampersand bracket bracket Vertical bar curly bracket	AABBAA	The first set of rhyming words is "hash", "dash", "slash", and "crash" and so these lines get a label `A`. "underscore" and "four" are the next set of rhyming words, so they get labelled "B".
4 12 placed traced selected elected bee connectivity see tree lan span man fan I think that I shall never A graph more lovely than a A tree whose crucial prope Is loop free connectivity A tree that must be sure t So packets can reach every First the root must be sel By ID it is elected Least cost paths from root In the tree these paths ar A mesh is made by folks li Then bridges find a spanni	AAAABBCCDDAA	
2 4 fight night bright near fear In a contest of code a cha With problems to solve bot With syntax and loops and We coded away and conquere	XXAA	Note that even though "appear" and "near" rhyme in reality, these words do not appear together in a list of rhyming words. Therefore, for the purposes of this problem, they are treated as non-rhyming.
1 4	AAXX	The note in the problem statement

Input	Output	Explanation
write For I have proofs to write And there are programs to And miles to go before I And miles to go before I		indicates that a word rhymes with itself, if and only if, it appears in one of the lists of rhyming words.