Problem C: Categories

Advanced Algorithms for Programming Contests

Restrictions

Time: 2 seconds
Memory: 512 MB

Problem description

We want to categorize a given set of words by the letters they begin and end with. For any category, specified by the begin- and the end-character, you are to find and output all words in it.

Input

The input consists of

- one line containing N ($1 \leq N \leq 10^5$) – the total number of words in the text – and M ($1 \leq M \leq 26^2$) – the number of testcases
- one line containing N strings, consisting of at most 20 letters each. You may assume all strings to only contain lowercase letters.
- M lines containing the testcases, each consisting of two lowercase letters, the begin- and end-character of all words in the category in question, respectively. The testcases are guaranteed to be pairwise distinct.

Output

For each of the testcases, output all words of the specified category in lexicographical order, separated by spaces. If a word appears multiple times, output it only once. If the specified category happens to be empty, output **"Empty category!"**.

Sample input and output

Input	Output
3 2 coin clown car a a c n	Empty category! clown coin