The English language uses a lot of different words. Some of these words are so similar they differ by only one letter. A game called word melt takes advantage of this. In the game, you move from one legal word to another by changing only one letter at a time. For example, we can get from the word “cute” to the word “pact” in a few steps.

cute
cure
pure
puce
pace
pact

Clearly, you can get to a lot of other words starting from a word like “cute.” Of course, you can’t get much of anywhere if you start with something like “zymogenesis.” Your job is to write a program that answers the question of how many words you can reach starting from a particular word, w. Given a dictionary of legal words, your program will report how many words are reachable starting from w.

Input

Input will start with a number, n, giving the number of words in the dictionary. This will be followed by n words, one per line. Words will be given in sorted order, and each word will consist of lower-case letters with no spaces. The dictionary will contain no duplicate words. The dictionary will be followed by a one or more query words from the dictionary, one per line. The sequence of query words will continue until the end of file.

Output

For each query, your program will print a line containing the query word followed by the number of dictionary words that are reachable via a sequence of legal word melt steps.

Sample Input

6
camel
tlace
tland
pace
puce
sand

Sample Output

land 2
pace 3
camel 1