

E. Vasya and Shifts

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Vasya has a set of $4n$ strings of equal length, consisting of lowercase English letters "a", "b", "c", "d" and "e".

Moreover, the set is split into n groups of 4 equal strings each. Vasya also has one special string a of the same length, consisting of letters "a" only.

Vasya wants to obtain from string a some fixed string b , in order to do this, he can use the strings from his set in any order. When he uses some string x , each of the letters in string a replaces with the next letter in alphabet as many times as the alphabet position, counting from zero, of the corresponding letter in string x . Within this process the next letter in alphabet after "e" is "a".

For example, if some letter in a equals "b", and the letter on the same position in x equals "c", then the letter in a becomes equal "d", because "c" is the second alphabet letter, counting from zero. If some letter in a equals "e", and on the same position in x is "d", then the letter in a becomes "c". For example, if the string a equals "abcde", and string x equals "baddc", then a becomes "bbabb".

A used string disappears, but Vasya can use equal strings several times.

Vasya wants to know for q given strings b , how many ways there are to obtain from the string a string b using the given set of $4n$ strings? Two ways are different if the number of strings used from some group of 4 strings is different. Help Vasya compute the answers for these questions modulo $10^9 + 7$.

Input

The first line contains two integers n and m ($1 \leq n, m \leq 500$) — the number of groups of four strings in the set, and the length of all strings.

Each of the next n lines contains a string s of length m , consisting of lowercase English letters "a", "b", "c", "d" and "e". This means that there is a group of four strings equal to s .

The next line contains single integer q ($1 \leq q \leq 300$) — the number of strings b Vasya is interested in.

Each of the next q strings contains a string b of length m , consisting of lowercase English letters "a", "b", "c", "d" and "e" — a string Vasya is interested in.

Output

For each string Vasya is interested in print the number of ways to obtain it from string a , modulo $10^9 + 7$.

Examples

input
1 1 b 2 a e
output
1 1

input
2 4 aaaa

bbbb 1 cccc
output
5

Note

In the first example, we have 4 strings "b". Then we have the only way for each string *b*: select 0 strings "b" to get "a" and select 4 strings "b" to get "e", respectively. So, we have 1 way for each request.

In the second example, note that the choice of the string "aaaa" does not change anything, that is we can choose any amount of it (from 0 to 4, it's 5 different ways) and we have to select the line "bbbb" 2 times, since other variants do not fit. We get that we have 5 ways for the request.