Gene

Input file:	standard input
Output file:	standard output
Time limit:	2.5 seconds
Memory limit:	512 megabytes

Let s and t be two strings with equal lengths M. Define $f(s,t) = \sum_{i=1}^{M}[s_i \neq t_i]$.

You are given N strings $s_1, s_2, \cdots, s_N$ and a constant threshold K. Each of the string contains exactly M lowercase letters. You need to perform the following queries Q times:

- Given a string t of length M, calculate $\sum_{i=1}^{N}[f(s_i, t) \leq K]$

Input

The first line of the input contains four integers N, Q, M, and K ($1 \leq N, Q \leq 300$, $1 \leq M \leq 60,000$, $1 \leq K \leq 10$).

The i-th line of the next N lines contains a single string s_i consisting exactly M lowercase letters.

The i-th line of the next Q lines contains a single string t consisting exactly M lowercase letters, indicating a query.

Output

For each query, output a single line contains a single integer, indicating the answer.

Examples

standard input	standard output
6 4 4 1 kaki kika manu nana tepu tero kaka mana teri anan	2 2 1 0
8 6 7 3 delphis aduncus peronii plumbea clymene hectori griseus electra delphis helpiii perphii clumeee eleelea ddlpcus	1 1 2 2 1 2