Boring Problem

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Given a string S, n strings $T_1, T_2, \dots, T_n$ of length m and a positive rational number sequence p of length k whose sum is 1. Each string consists of only the first k lowercase letters. Let's perform the following procedure:

1. If there exists j $(1 \le j \le n)$ such that T_j is a substring of S, stop the procedure.
2. Append the i-th lowercase letter with probability p_i to the end of S, then return to step 1.

Let's define $f(S; T, p)$ as the expected length of S when the procedure stops.

It's boring to calculate $f(S; T, p)$ for only one string S. To make the problem much harder, a string R is given. Let's denote the prefix of R of length i as $R[1 \dots i]$. Your task is to calculate $f(R[1 \dots i]; T, p)$ for $i = 1, 2, \cdots, |R|$.

It can be proved that $f(S; T, p)$ is a positive rational number and it can be represented as $\frac{P}{Q}$ with $\gcd(P, Q) = 1$. It is guaranteed that $Q \not\equiv 0 \pmod{(10^9 + 7)}$ for all strings S under the given T and p in the input. You should print the value of $PQ^{-1} \mod (10^9 + 7)$.

Input

The first line contains three positive integers n, m and k $(1 \le n \le 100,\ n \times m \le 10\,000,\ 1 \le k \le 26)$.

The second line contains k positive integers $p'_1, p'_2 \cdots, p'_k$. It is guaranteed that $p'_1 + p'_2 + \cdots + p'_k = 100$ and the probability p_i equals to $\frac{p'_i}{100}$.

The i-th line of the following n lines contains a string T_i of length m.

The last line contains a string R $(1 \le |R| \le 10\,000)$.

It is guaranteed each string consists of only the first k lowercase letters and $Q \not\equiv 0 \pmod{(10^9 + 7)}$ when representing $f(S; T, p)$ as $\frac{P}{Q}$ with $\gcd(P, Q) = 1$ for all strings S under the given T and p in the input.

Output

Ouput $|R|$ lines. The i-th line contains an integer representing the value of $f(R[1 \dots i]; T, p)$.

Examples

standard input	standard output
2 2 2 50 50 aa bb ababaa	3 4 5 6 7 6
3 3 3 25 25 50 abc bac cab ababbabbcaaa	13 333333343 333333344 333333345 17 333333347 333333348 20 333333358 666666692 23 24
4 4 4 10 20 30 40 abcb cabc abbb cccc ababacabaabcca	146386692 32395942 146386694 32395944 146386696 851050282 242422295 512573933 146386700 146386701 32395951 66073407 572924730 242422302