Problem F. StrCartesian

Input file:	*standard input*
Output file:	*standard output*
Time limit:	13 seconds
Memory limit:	768 mebibytes

Given are two sets of strings $A = \{a_1, a_2, \ldots, a_n\}$ and $B = \{b_1, b_2, \ldots, b_m\}$. Define a sequence of $n \cdot m$ pairwise concatenations of a_i and b_j:

$$S = (a_1b_1, a_1b_2, \ldots, a_1b_m, a_2b_1, a_2b_2, \ldots, a_2b_m, \ldots, a_nb_1, a_nb_2, \ldots, a_nb_m).$$

Now sort the sequence S lexicographically, and let the sorted sequence be $C = (c_1, c_2, \ldots, c_{n \cdot m})$.

We want to know the sequence C, but it is too large. So we make q queries to your program, and the i-th query asks for c_{k_i}.

However, c_{k_i} is still too long to output. If the answer equals $c = a_f + b_s$, then your program only needs to output the pair (f, s).

Input

The first line contains two integers n and m ($1 \le n, m \le 5 \cdot 10^4$), the sizes of sets A and set B.

The following n lines contain n **distinct** non-empty strings $a_1, a_2, \ldots, a_n$.

The total length of strings in set A does not exceed 10^6.

The following m lines contain m **distinct** non-empty strings $b_1, b_2, \ldots, b_m$.

The total length of strings in set B does not exceed 10^6.

All strings consist of lowercase English letters.

The next line contains one integer q ($1 \le q \le 1000$), the number of queries.

In the following q lines, the i-th line contains an integer k_i ($1 \le k_i \le n \cdot m$), specifying that the query asks for the k_i-th element of C.

Output

Print q lines. The i-th line must contain two integers f_i and s_i ($1 \le f_i \le n$; $1 \le s_i \le m$) specifying that the answer c_{k_i} equals to $a_{f_i}b_{s_i}$. If there are multiple correct answers, your program may output any one of them.

Example

standard input	*standard output*
2 3 a ab a aa ba 2 3 4	2 1 1 3