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E. Unpleasant Strings

time limit per test: 2 seconds memory limit per test: 512 megabytes

Let's call a letter allowed if it is a lowercase letter and is one of the first k letters of the Latin alphabet.

You are given a string s of length n, consisting only of allowed letters.

Let's call a string t pleasant if t is a subsequence of s.

You are given q strings t_1, t_2, \ldots, t_q . All of them consist only of allowed letters. For each string t_i , calculate the minimum number of allowed letters you need to append to it on the right so that it **stops** being pleasant.

A sequence t is a subsequence of a sequence s if t can be obtained from s by the deletion of several (possibly, zero or all) element from arbitrary positions.

Input

The first line contains two integers n and k ($1 \le n \le 10^6$; $1 \le k \le 26$) — the length of the string s and the number of allowed letters.

The second line contains the string s, consisting of n lowercase Latin letters. Each character of the string is one of the first k letters of the Latin alphabet.

The third line contains one integer q ($1 \le q \le 2 \cdot 10^5$) — the number of queries.

The next q lines contain queries: one query per line. The i-th line contains the string t_i , consisting only of allowed letters.

Additional constraint on input: the total length of all t_i does not exceed 10^6 .

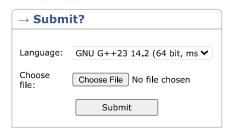
Output

For each query, output one integer — the minimum number of allowed letters that need to be appended to the string on the right so that it stops being pleasant.

Examples input







→ Last submissions		
Submission	Time	Verdict
317641920	Apr/28/2025 19:10	Accepted

Сору

Note

In the first example:

- 1. The string $\ensuremath{\mathtt{cc}}$ is already unpleasant, so nothing needs to be appended to it;
- 2. bcb is pleasant, so at least one letter needs to be appended to the right: bcba will not work, but bcbb and bcbc are unpleasant.
- 3. To b, at least two letters need to be appended, since ba, bb, and bc are pleasant. For example, we can obtain an unpleasant string bbb.

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