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 Copy

```
7 3
abacaba
3
cc
bcb
b
```

output Copy

```
0
1
2
```

input Copy

```
5 1
aaaaa
6
a
aa
aaa
aaaa
aaaaa
aaaaaa
```

output Copy

```
5
4
3
2
```

```
1
0
```

Note

In the first example:

1. The string `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`.