String Operation

Time: 1 sec / Memory: 256 MB

Problem Statement

In this problem, you are given a string s that an alphabet of the first k characters from {a,b,...,z} and the replacement rules for each of the k characters.

Your task is to apply a number of replacement operations to the given string s and output the length of the resulting string modulo $10^9 + 7$.

For example, suppose that $k = 3$, the input string is `cab`, and the replacement rules are as follows.

- The character `a` is to be replaced by `abc`.
- The character `b` is to be replaced by `cb`.
- The character `c` is to be replaced by `a`.

Then the first replacement operation will turn the input string `cab` into `aabccb`. The second operation will make it `abcabccbaacb`, and so on so forth.

Input

The first line contains two integers n and m: the length of string s and the number of replacement operations to perform.

The second line contains the string s.

The third line contains an integer k, which denotes the number of leading characters in {a,b,...,z} to be used.

After this, there are k lines, where the i-th line contains a string p_i to denote the rule of replacing the i-th character in {a,b,...,z} with the string p_i.

You may assume that

- $1 \leq n \leq 500$

- $1 \leq m \leq 10^9$
- $1 \leq k \leq 26$
- $1 \leq |p_i| \leq 20$ for all $1 \leq i \leq k$.

Furthermore, s and p_i for all i contain only the first k characters from {a,b,...,z}.

Output

Print the length of the resulting string after m replacement operations modulo $10^9 + 7$.

Example

Input1:

```
3 2
cab
3
abc
cb
a
```

Output1:

```
12
```

Input2:

```
3 1
aab
3
abc
cb
a
```

Output2:

```
8
```

Input3:

```
5 5
aacce
5
db
aee
eb
ba
dd
```

Output3:

```
264
```