
Subway Lines

X29412_en

Ben Zynoulus lives in a city in Meashara. He travels around only by subway. Each subway line is a cycle, thus if you enter at station s_1 , you will reach s_2 , then s_3 , ..., s_k , then you return to s_1 , then to s_2 , and so on.

Each subway line is unidirectional: you can go from s_1 to s_2 , but not from s_2 to s_1 . In some cases there might be another subway line which goes from s_2 to s_1 ; however, Ben has a rule that, after going from s_1 to s_2 , he never goes back directly to s_1 .

As every subway user, Ben has a card to pay for his tickets, and this card notes the number of stations travelled so far, over all his lifetime. Now, Ben has a question: how many possible routes could he have taken, according to his rules? If there are two subway lines which go from s_1 to s_2 , then he considers routes using them distinct.

Input

Each subway station has a code, which is a lowercase letter of the English alphabet.

The first line contains N ($1 \leq N \leq 5$), the number of subway routes, and L ($1 \leq L \leq 30000000$), the number of stations travelled so far. Each of the following N lines contains a description of one subway route, as a string. These are codes of consecutive stations of the given route.

Output

Output the number of possible routes modulo 1000007.

Sample input

```
3 10
abcde
abcde
edcba
```

Sample output

```
5125
```

In this case Ben can travel either a-b-c-d-e-a..., or e-d-c-b-a-e... He cannot change between these two options, since he would break his rule. However, in the first case, he can change the subway line he is using after each station. This gives us $5 \cdot (2^{10} + 1)$ possible routes in total.

Problem information

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