

7842 Message

A student wants to send to his friend a message, which is a text string p consisting of only lowercase latin alphabet letters. To encrypt his message, he creates a lowercase alphabet string h of size n that contains p as a substring. The student is curious to find out how many different ways there are to create such a string h .

Given two positive integers n , M and a string p consisting of only lowercase latin alphabet letters, let's denote K to be the total number of different ways to create a lowercase alphabet string h of size n such that p is a substring of h . Your task is to find the remainder of K divided by M .

Input

The input consists of several datasets. The first line of the input contains the number of datasets which is a positive integer and is not greater than 20. The following lines describe the datasets.

Each dataset is described by the following lines:

- The first line contains two positive integers n, M ($n \leq 10^{12}$; $M \leq 10^{12}$);
- The next line contains the text string p consisting of at most 50 lowercase latin alphabet letters.

Output

For each dataset, write in one line the remainder of K divided by M .

Sample Input

```
2
2 100
ab
3 100
ab
```

Sample Output

```
1
52
```