DMPG '19 G6 - Pairs

Time limit: 1.0s **Memory limit:** 256M

A string S of length N is given. Alice has written all $\binom{N+1}{2}^2$ ordered pairs (s, t) of substrings of S. For each pair, she computes the length of the longest common prefix of the two substrings. How many times does she write down each number from 1 to N? As these numbers may be large, please output them modulo $10^9 + 7$.

Constraints

S contains only lowercase English letters.

Subtask 1 [10%]

$1 \leq N \leq 100$

Subtask 2 [20%]

$1 \leq N \leq 500$

Subtask 3 [20%]

$1 \leq N \leq 2\,000$

Subtask 4 [50%]

$1 \leq N \leq 200\,000$

Input Specification

The first line contains a single integer N.
The next line contains the string S.

Output Specification

Output $N + 1$ lines. On the i^{th} line, print the number of pairs of substrings which have a longest common prefix of length $i - 1$, modulo $10^9 + 7$.

Sample Input 1

```
3
ccc
```

Sample Output 1

```
0
27
8
1
```

Sample Input 2

```
4
dmpg
```

Sample Output 2

```
70
16
9
4
1
```