Longest Common Prefix

Time: 1 sec / Memory: 2 GB

Problem Statement

You are given a string s of length n.

Let $f(i, j)$ be the length of the longest common prefix of $s_{i,i+1,\ldots,n}$ and $s_{j,j+1,\ldots,n}$.

Your program should output $\sum_{1 \leq i,j \leq n} f(i, j)$.

Input

The first line contains a integer n: the length of the string.
The second line contains the string s, consisting of n lowercase alphabets.

Output

Output $\sum_{1 \leq i,j \leq n} f(i, j)$.

Constraints

$1 \leq n \leq 5000$

Example

Input 1:

```
4
abab
```

Output 1:

```
16
```

In this example,

f(1, 1) = 4, f(1, 2) = 0, f(1, 3) = 2, f(1, 4) = 0

f(2, 1) = 0, f(2, 2) = 3, f(2, 3) = 0, f(2, 4) = 1

f(3, 1) = 2, f(3, 2) = 0, f(3, 3) = 2, f(3, 4) = 0

f(4, 1) = 0, f(4, 2) = 1, f(4, 3) = 0, f(4, 4) = 1