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E. Palisection

time limit per test: 2 seconds
 memory limit per test: 128 megabytes

In an English class Nick had nothing to do at all, and remembered about wonderful strings called palindromes. We should remind you that a string is called a palindrome if it can be read the same way both from left to right and from right to left. Here are examples of such strings: «eye», «pop», «level», «aba», «deed», «racecar», «rotor», «madam».

Nick started to look carefully for all palindromes in the text that they were reading in the class. For each occurrence of each palindrome in the text he wrote a pair — the position of the beginning and the position of the ending of this occurrence in the text. Nick called each occurrence of each palindrome he found in the text subpalindrome. When he found all the subpalindromes, he decided to find out how many different pairs among these subpalindromes cross. Two subpalindromes cross if they cover common positions in the text. No palindrome can cross itself.

Let's look at the actions, performed by Nick, by the example of text «babb». At first he wrote out all subpalindromes:

- «b» — 1..1
- «bab» — 1..3
- «a» — 2..2
- «b» — 3..3
- «bb» — 3..4
- «b» — 4..4

Then Nick counted the amount of different pairs among these subpalindromes that cross. These pairs were six:

1. 1..1 cross with 1..3
2. 1..3 cross with 2..2
3. 1..3 cross with 3..3
4. 1..3 cross with 3..4
5. 3..3 cross with 3..4
6. 3..4 cross with 4..4

Since it's very exhausting to perform all the described actions manually, Nick asked you to help him and write a program that can find out the amount of different subpalindrome pairs that cross. Two subpalindrome pairs are regarded as different if one of the pairs contains a subpalindrome that the other does not.

Input

The first input line contains integer n ($1 \leq n \leq 2 \cdot 10^6$) — length of the text. The following line contains n lower-case Latin letters (from a to z).

Output

In the only line output the amount of different pairs of two subpalindromes that cross each other. Output the answer modulo 51123987.

Examples

input

Copy

→ Attention

The package for this problem was not updated by the problem writer or Codeforces administration after we've upgraded the judging servers. To adjust the time limit constraint, a solution execution time will be multiplied by 2. For example, if your solution works for 400 ms on judging servers, then the value 800 ms will be displayed and used to determine the verdict.

Codeforces Beta Round 17

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms) ▼

Choose file: No file chosen

Submit

→ Last submissions

| Submission | Time | Verdict |
|------------|------|---------|
|------------|------|---------|

| | |
|--------|-----------------|
| 4 | babb |
| output | <div>Copy</div> |
| 6 | |
| input | <div>Copy</div> |
| 2 | aa |
| output | <div>Copy</div> |
| 2 | |

| | | |
|---------------------------|-------------------|----------|
| 327249237 | Jul/03/2025 17:20 | Accepted |
|---------------------------|-------------------|----------|

→ Problem tags

strings

*2900

No tag edit access

→ Contest materials

Announcement

Tutorial

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