Problem C. Cyclic Substrings

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Mr. Ham is interested in strings, especially palindromic strings. Today, he finds a string s of length n.

For the string s of length n, he defines its *cyclic substring* from the i-th character to the j-th character ($1 \le i, j \le n$) as follows:

- If $i \le j$, the cyclic substring is the substring of s from the i-th character to the j-th character. He denotes it as $s[i..j]$.
- If $i > j$, the cyclic substring is $s[i..n] + s[1..j]$, where $+$ denotes the concatenation of two strings. He also denotes it as $s[i..j]$.

For example, if $s = \texttt{12345}$, then $s[2..4] = \texttt{234}$, $s[4..2] = \texttt{4512}$, and $s[3..3] = \texttt{3}$.

A string t is *palindromic* if $t[i] = t[n - i + 1]$ for all i from 1 to n. For example, `1221` is palindromic, while `123` is not.

Given the string s, there will be many cyclic substrings of s which are palindromic. Denote P as the set of all **distinct** cyclic substrings of s which are palindromic, $f(t)(t \in P)$ as the number of times t appears in s as a cyclic substring, and $g(t)(t \in P)$ as the length of t. Mr. Ham wants you to compute

$$\sum_{t \in P} f(t)^2 \times g(t)$$

The answer may be very large, so you only need to output the answer modulo 998 244 353.

Input

The first line contains a number n ($1 \le n \le 3 \times 10^6$), the length of the string s.

The second line contains a string s of length n. Each character of s is a digit.

Output

Output a single integer, denoting the sum modulo 998 244 353.

Examples

standard input	standard output
5 01010	39
8 66776677	192

Note

In the sample, the palindromic cyclic substrings of s are:

- $s[1..1] = s[3..3] = s[5..5] = \texttt{0}$.
- $s[2..2] = s[4..4] = \texttt{1}$.
- $s[5..1] = \texttt{00}$.

- $s[1..3] = s[3..5] = 010$.
- $s[2..4] = 101$.
- $s[4..2] = 1001$.
- $s[1..5] = 01010$.

The answer is $3^2 \times 1 + 2^2 \times 1 + 1^2 \times 2 + 2^2 \times 3 + 1^2 \times 3 + 1^2 \times 4 + 1^2 \times 5 = 39$.