E. Hongcow Masters the Cyclic Shift

time limit per test: 5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Hongcow's teacher heard that Hongcow had learned about the cyclic shift, and decided to set the following problem for him.

You are given a list of n strings $s_1, s_2, ..., s_n$ contained in the list A.

A list X of strings is called *stable* if the following condition holds.

First, a *message* is defined as a concatenation of some elements of the list X. You can use an arbitrary element as many times as you want, and you may concatenate these elements in any arbitrary order. Let S_X denote the set of of all messages you can construct from the list. Of course, this set has infinite size if your list is nonempty.

Call a single message *good* if the following conditions hold:

- Suppose the message is the concatenation of k strings $w_1, w_2, ..., w_k$, where each w_i is an element of X.
- Consider the $|w_1| + |w_2| + ... + |w_k|$ cyclic shifts of the string. Let m be the number of these cyclic shifts of the string that are elements of S_X.
- A message is good if and only if m is exactly equal to k.

The list X is called stable if and only if every element of S_X is good.

Let $f(L)$ be 1 if L is a stable list, and 0 otherwise.

Find the sum of $f(L)$ where L is a nonempty **contiguous sublist** of A (there are contiguous sublists in total).

Input

The first line of input will contain a single integer n ($1 \le n \le 30$), denoting the number of strings in the list.

The next n lines will each contain a string s_i ().

Output

Print a single integer, the number of nonempty **contiguous sublists** that are stable.

Examples

input
4 a ab b bba
output
7

input
5 hh ee ll ll oo
output

```
0
```

input

```
6
aab
ab
bba
b
ab
c
```

output

```
13
```

Note

For the first sample, there are 10 sublists to consider. Sublists ["a", "ab", "b"], ["ab", "b", "bba"], and ["a", "ab", "b", "bba"] are not stable. The other seven sublists are stable.

For example, X = ["a", "ab", "b"] is not stable, since the message "ab" + "ab" = "abab" has four cyclic shifts ["abab", "baba", "abab", "baba"], which are all elements of S_X.