Word Chain

Time Limit: 1 Second
Memory Limit: 256 MB

A word chain is a sequence of words $w_1, \ldots, w_n$ such that $\forall i > 1$, the last letter of w_{i-1} is the same as the first letter of w_i. The length of a word chain is the sum over lengths of all words in the sequence. Given a list of words, find out the shortest word chain that contains all words in the list. It is guaranteed that the at least one such chain exists.

Hint: You might find `next_permutation` useful.

Input

The first line of input contains a single integer n ($1 \leq n \leq 10$) - the number of words in the list.

The next n lines describe the words. Each line contains a string s ($1 \leq |s| \leq 100$) denoting a word in the list.

Output

output a single integer denoting the length of the shortest word chain containing all words in the list.

Sample Inputs

```
3
science
economics
education
```

Sample Outputs

```
25
```

Note

The shortest possible word chain is `economics - science - education`.