

C. The Smallest String Concatenation

time limit per test: 3 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

You're given a list of n strings a_1, a_2, \dots, a_n . You'd like to concatenate them together in some order such that the resulting string would be lexicographically smallest.

Given the list of strings, output the lexicographically smallest concatenation.

Input

The first line contains integer n — the number of strings ($1 \leq n \leq 5 \cdot 10^4$).

Each of the next n lines contains one string a_i ($1 \leq |a_i| \leq 50$) consisting of only lowercase English letters. The sum of string lengths will not exceed $5 \cdot 10^4$.

Output

Print the only string a — the lexicographically smallest string concatenation.

Examples

input
4 abba abacaba bcd er
output
abacabaabbabcder

input
5 x xx xxa xxaa xxaaa
output
xxaaaxxaaxxxxx

input
3 c cb cba
output
cbacbc