

Cat Cut

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

You are given N strings S_1, \dots, S_N , each consisting of lowercase English letters and having length M . Initially, let $X = S_1$, and perform the following operation $N - 1$ times.

In the i -th operation, let Y be the string formed by concatenating X and S_{i+1} in this order. Then, choose any contiguous substring of Y of length M , and replace X with that substring.

Output the lexicographically smallest string that can possibly be the final value of X .

Input

The first line contains integers N, M in this order. ($2 \leq N \leq 2000, 1 \leq M \leq 2000$)

Each of the following N lines contains a string S_i of length M , consisting of lowercase English letters.

Output

Print the answer.

Examples

standard input	standard output
2 3 cat cut	atc
2 1 a b	a
3 8 jastaway tatesoto soryuusi	asoryuus

Note

In the first example, initially $X = \text{cat}$.

In the first operation, $Y = \text{catcut}$. If we choose the contiguous substring from the 2-nd to the 4-th character, then $X = \text{atc}$, which is the lexicographically smallest possible.