Cat Cut

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

You are given N strings $S_1, \ldots, S_N$, 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 $X =$ `cat`.

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