E. Cutting the Line

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a non-empty line s and an integer k. The following operation is performed with this line exactly once:

- A line is split into **at most** k non-empty substrings, i.e. string s is represented as a concatenation of a set of strings $s = t_1 + t_2 + ... + t_m$, $1 \le m \le k$.
- Some of strings t_i are replaced by strings t_i^r, that is, their record from right to left.
- The lines are concatenated back in the same order, we get string $s' = t'_1 t'_2 ... t'_m$, where t'_i equals t_i or t_i^r.

Your task is to determine the lexicographically smallest string that could be the result of applying the given operation to the string s.

Input

The first line of the input contains string s ($1 \le |s| \le 5\,000\,000$), consisting of lowercase English letters. The second line contains integer k ($1 \le k \le |s|$) — the maximum number of parts in the partition.

Output

In the single line print the lexicographically minimum string s' which can be obtained as a result of performing the described operation.

Examples

input
aba 2
output
aab

input
aaaabacaba 2
output
aaaaabacab

input
bababa 1
output
ababab

input
abacabadabacaba 4
output
aababacabacabad