Problem G. Encoded Strings II

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Tommy has just invented an interesting string encoding algorithm, which is described below.

- For every string S, we may define a character-mapping function F_S, which maps every character occurring in S to a lowercase letter, as below

$$F_S(c) = \mathrm{chr}(G(c, S))$$

  where $\mathrm{chr}(i)$ is the $(i+1)$-th lowercase Latin letter, and $G(c, S)$ is the number of different characters after the last occurrence of c in S.

- To encode a string S by Tommy's algorithm, replace every character c in S by $F_S(c)$ simultaneously.

For example, the encoded string of `abc` is `cba`, and the encoded string of `cac` is `aba`.

You are given a string of length n and then encode all the $2^n - 1$ **nonempty subsequences**. Your task is to find the encoded string that has the greatest lexicographical order among all the encoded strings.

Input

The first line contains an integer n ($1 \le n \le 1\,000$).

The second line contains a string of length n, which consists of only the first 20 lowercase letters, `a` to `t`.

Output

Output the encoded string that has the greatest lexicographical order among all the encoded strings.

Examples

standard input	standard output
4 aacc	bbaa
4 acac	bba