

Problem E. Optimal Splitting

Input file: **standard input**
Output file: **standard output**
Time limit: **3 seconds**
Memory limit: **1024 megabytes**

You are given a string S of length N consisting of lowercase latin letters.

You need to partition S into two disjoint subsequences X and Y such that each character of S belongs to exactly one subsequence.

Without loss of generality, assume $|X| \geq |Y|$ (otherwise, swap X and Y). Append character **a** to the end of Y until $|Y| = |X|$.

Now define a string Z of length $|X|$ such that $Z_i = \max(X_i, Y_i)$ for every $1 \leq i \leq |X|$.

Find the lexicographically smallest possible string Z .

A sequence is a subsequence of a sequence if it can be obtained from it by deleting several, possibly zero or all, elements from arbitrary positions.

A string U is said to be lexicographically smaller than a string V if and only if one of the following conditions holds:

- U is a prefix of V , but $U \neq V$;
- In the first position where U and V differ, the string U has a letter that appears earlier in the alphabet than the corresponding letter in V .

Input

The input is given in the following format:

T
N
S
\vdots

- $1 \leq T \leq 10^4$
- $1 \leq N \leq 5000$
- S is a string of length N consisting of lowercase latin letters.
- It is guaranteed that the sum of N^2 over all test cases does not exceed 5000^2 .

Output

For each test case, output one line containing the lexicographically smallest possible string Z .

Examples

standard input	standard output
3	a
1	z
a	aba
2	
za	
5	
ababa	

Note

Test case 3: Choose $X = aba$ and $Y = ab$. After appending one a to Y , we get $Y = aba$, so $Z = \max(aba, aba) = aba$. Hence, the answer is aba.