D - String Rotation

Editorial (/contests/abc409/tasks/abc409_d/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 400 points

Problem Statement

You are given a string $S = S_1S_2 \dots S_N$ of length N consisting of lowercase English letters. You will perform the following operation on S exactly once:

- Choose a contiguous substring of S with length at least 1 and cyclically shift it to the left by 1. That is, choose integers $1 \leq \ell \leq r \leq N$, insert S_ℓ to the right of the r-th character of S, and then delete the ℓ-th character of S.

Find the lexicographically smallest string among all possible strings that S can become after the operation.

You are given T test cases, so solve each of them.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq N \leq 10^5$
- S is a string of length N consisting of lowercase English letters.
- T and N are integers.

- The sum of N over all test cases in a single input file is at most 10^5.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&T \\
&\mathrm{case}_1 \\
&\mathrm{case}_2 \\
&\vdots \\
&\mathrm{case}_T
\end{aligned}
$$

Each test case case_i $(1 \leq i \leq T)$ is given in the following format:

$$
\begin{aligned}
&N \\
&S
\end{aligned}
$$

Output

Output T lines. The i-th $(1 \leq i \leq T)$ line should contain the answer for case_i.

Sample Input 1 Copy

Copy

```
3
7
atcoder
1
x
5
snuke
```

Sample Output 1 Copy

Copy

```
acodert
x
nsuke
```

- In the first test case, cyclically shifting from the 2nd to the 7th character gives `acodert`, which is lexicographically smallest.
- In the second test case, no matter how you operate, you get `x`.
- In the third test case, cyclically shifting from the 1st to the 2nd character gives `nsuke`, which is lexicographically smallest.

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Language

Python (CPython 3.11.4)

Source Code

Open File | Customize | Toggle Editor | Auto Height

```
1
```

* at most 512 KiB

* Your source code will be saved as Main.*extension*.

Submit

#telegram)

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