

PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS HACKS ROOM STANDINGS CUSTOM INVOCATION

### C. Largest Subsequence

time limit per test: 1 second  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

Given is a string  $s$  of length  $n$ . In one operation you can select the lexicographically largest<sup>†</sup> subsequence of string  $s$  and cyclic shift it to the right<sup>‡</sup>.

Your task is to calculate the minimum number of operations it would take for  $s$  to become sorted, or report that it never reaches a sorted state.

<sup>†</sup> A string  $a$  is lexicographically smaller than a string  $b$  if and only if one of the following holds:

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

<sup>‡</sup> By cyclic shifting the string  $t_1 t_2 \dots t_m$  to the right, we get the string  $t_m t_1 \dots t_{m-1}$ .

#### Input

Each test consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 10^4$ ) — the number of test cases. The description of the test cases follows.

The first line of each test case contains a single integer  $n$  ( $1 \leq n \leq 2 \cdot 10^5$ ) — the length of the string  $s$ .

The second line of each test case contains a single string  $s$  of length  $n$ , consisting of lowercase English letters.

It is guaranteed that sum of  $n$  over all test cases does not exceed  $2 \cdot 10^5$ .

#### Output

For each test case, output a single integer — the minimum number of operations required to make  $s$  sorted, or  $-1$  if it's impossible.

#### Example

input	Copy
6 5 aaabc 3 acb 3 bac 4 zbca 15 czddeneeeeemigec 13 cdefmopqsvxzz	
output	Copy
0 1 -1 2 6 0	

#### Note

In the first test case, the string  $s$  is already sorted, so we need no operations.

In the second test case, doing one operation, we will select  $cb$  and cyclic shift it. The string  $s$  is now  $abc$  which is sorted.

#### Codeforces Round 915 (Div. 2)

Finished

Practice



#### → Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

#### → Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

#### → Submit?

Language: Python 3.8.10  
Almost always, if you send a solution on PyPy, it works much faster

Choose file: Choose File No file chosen

Submit

#### → Last submissions

Submission	Time	Verdict
<a href="#">271084875</a>	Jul/17/2024 23:23	Accepted
<a href="#">271082983</a>	Jul/17/2024 22:58	Wrong answer on test 2
<a href="#">271082441</a>	Jul/17/2024 22:52	Wrong answer on test 2
<a href="#">271080941</a>	Jul/17/2024 22:35	Wrong answer on test 2

#### → Problem tags

greedy strings \*1400

No tag edit access

#### → Contest materials

- Announcement (en) ✕
- Tutorial (en) ✕

In the third test case,  $s$  cannot be sorted.

In the fourth test case we will perform the following operations:

- The lexicographically largest subsequence is  $zca$ . Then  $s$  becomes  $abzc$ .
- The lexicographically largest subsequence is  $zc$ . Then  $s$  becomes  $abcz$ . The string becomes sorted.

Thus, we need 2 operations.

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