

A. Entertainment in MAC

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Congratulations, you have been accepted to the Master's Assistance Center! However, you were extremely bored in class and got tired of doing nothing, so you came up with a game for yourself.

You are given a string  $s$  and an **even** integer  $n$ . There are two types of operations that you can apply to it:

1. Add the reversed string  $s$  to the end of the string  $s$  (for example, if  $s = \text{cpm}$ , then after applying the operation  $s = \text{cpmmmpc}$ ).
2. Reverse the current string  $s$  (for example, if  $s = \text{cpm}$ , then after applying the operation  $s = \text{mpc}$ ).

It is required to determine the lexicographically smallest<sup>†</sup> string that can be obtained after applying **exactly**  $n$  operations. Note that you can apply operations of different types in any order, but you must apply exactly  $n$  operations in total.

<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  $b$ .

Input

Each test consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 500$ ) — the number of test cases. The description of the test cases follows.

The first line of each test case contains a single **even** integer  $n$  ( $2 \leq n \leq 10^9$ ) — the number of operations applied to the string  $s$ .

The second line of each test case contains a single string  $s$  ( $1 \leq |s| \leq 100$ ), consisting of lowercase English letters, — the string to which the operations are applied.

Output

For each test case, output a single line — the lexicographically smallest string that can be obtained after applying exactly  $n$  operations.

Example

input

Copy

5  
4  
cpm  
2  
grib  
10  
kupitimidlablodarbuz  
1000000000  
capybara  
6  
abacaba

output

Copy

cpm  
birggrib  
kupitimidlablodarbuz  
arabypaccapybara  
abacaba

Codeforces Round 932 (Div. 2)

Finished

→ Practice?

Want to solve the contest problems after the official contest ends? Just register for practice and you will be able to submit solutions.

Register for 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

→ Problem tags

constructive algorithms strings \*800

No tag edit access

→ Contest materials

Announcement (en)

Tutorial (en)

**Note**

In the first test case, you can apply the operation of the second type (i.e., reverse the string  $s$ ) 4 times. Then the string  $s$  will remain equal to `cpm`.

In the second test case, you can do the following:

- Apply the operation of the second type, after which  $s$  will become equal to `birg`.
- Apply operation of the first type (i.e., add the reversed string  $s$  to the end of the string  $s$ ), after which  $s$  will become equal to `birggrib`.

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