

HOME TOP CONTESTS GYM PROBLEMSET GROUPS RATING EDU API CALENDAR HELP DELTIX ROUNDS 2021 🛣

PROBLEMS SUBMIT STATUS STANDINGS CUSTOM TEST

## D. a-Good String

time limit per test: 2 seconds memory limit per test: 256 megabytes input: standard input output: standard output

You are given a string  $s[1\dots n]$  consisting of lowercase Latin letters. It is guaranteed that  $n=2^k$  for some integer  $k\geq 0$ .

The string  $s[1\dots n]$  is called c-good if at least one of the following three conditions is satisfied:

- The length of s is 1, and it consists of the character c (i.e.  $s_1 = c$ );
- The length of s is greater than 1, the first half of the string consists of only the character c (i.e.  $s_1=s_2=\cdots=s_{\frac{n}{2}}=c$ ) and the second half of the string (i.e. the string  $s_{\frac{n}{2}+1}s_{\frac{n}{2}+2}\dots s_n$ ) is a (c+1)-good string;
- The length of s is greater than 1, the second half of the string consists of only the character c (i.e.  $s_{\frac{n}{2}+1}=s_{\frac{n}{2}+2}=\cdots=s_n=c$ ) and the first half of the string (i.e. the string  $s_1s_2\ldots s_{\frac{n}{2}}$ ) is a (c+1)-good string.

For example: "aabc" is 'a'-good, "ffgheeee" is 'e'-good.

In one move, you can choose one index i from 1 to n and replace  $s_i$  with any lowercase Latin letter (any character from 'a' to 'z').

Your task is to find the minimum number of moves required to obtain an 'a'-good string from s (i.e. c-good string for c = 'a'). It is guaranteed that the answer always exists.

You have to answer t independent test cases.

Another example of an 'a'-good string is as follows. Consider the string s="cdbbaaaa". It is an 'a'-good string, because:

- the second half of the string ("aaaa") consists of only the character 'a';
- the first half of the string ("cdbb") is 'b'-good string, because:
  - the second half of the string ("bb") consists of only the character 'b';
  - the first half of the string ("cd") is 'c'-good string, because:
    - the first half of the string ("c") consists of only the character 'c';
    - the second half of the string ("d") is 'd'-good string.

## Input

The first line of the input contains one integer t ( $1 \le t \le 2 \cdot 10^4$ ) — the number of test cases. Then t test cases follow.

The first line of the test case contains one integer n ( $1 \le n \le 131\ 072$ ) — the length of s. It is guaranteed that  $n=2^k$  for some integer  $k\ge 0$ . The second line of the test case contains the string s consisting of n lowercase Latin letters.

It is guaranteed that the sum of n does not exceed  $2 \cdot 10^5$  ( $\sum n \le 2 \cdot 10^5$ ).

### Output

For each test case, print the answer — the minimum number of moves required to obtain an 'a'-good string from s (i.e. c-good string with c ='a'). It is guaranteed that the answer exists.

## Example

# input Copy 6 8 bbdcaaaa

# Codeforces Round #656 (Div. 3)

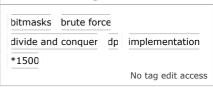
#### **Finished**

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Start virtual contest





### → Contest materials

Announcement
 Tutorial

8	
asdfghjk	
8	
ceaaaabb	
8	
bbaaddcc	
1	
Z	
2	
ac	
output	Сору
0	
7	
4	
5	
1	
1	

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