

Problem E. Ugu

Time limit 1000 ms

Mem limit 262144 kB

A binary string is a string consisting only of the characters 0 and 1. You are given a binary string $s_1 s_2 \dots s_n$. It is necessary to make this string non-decreasing in the least number of operations. In other words, each character should be not less than the previous. In one operation, you can do the following:

- Select an arbitrary index $1 \leq i \leq n$ in the string;
- For all $j \geq i$, change the value in the j -th position to the opposite, that is, if $s_j = 1$, then make $s_j = 0$, and vice versa.

What is the minimum number of operations needed to make the string non-decreasing?

Input

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

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

The second line of each test case contains a binary string s of length n .

It is guaranteed that the 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 that are needed to make the string non-decreasing.

Sample 1

Input	Output
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Input	Output
8	0
1	1
1	2
2	1
10	2
3	3
101	1
4	5
1100	
5	
11001	
6	
100010	
10	
0000110000	
7	
0101010	

Note

In the first test case, the string is already non-decreasing.

In the second test case, you can select $i = 1$ and then $s = 01$.

In the third test case, you can select $i = 1$ and get $s = 010$, and then select $i = 2$. As a result, we get $s = 001$, that is, a non-decreasing string.

In the sixth test case, you can select $i = 5$ at the first iteration and get $s = 100001$. Then choose $i = 2$, then $s = 111110$. Then we select $i = 1$, getting the non-decreasing string $s = 000001$.