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# G. Gangsta

time limit per test: 2 seconds memory limit per test: 256 megabytes

You are given a binary string  $s_1 s_2 \dots s_n$  of length n. A string s is called binary if it consists only of zeros and ones.

For a string p, we define the function f(p) as the maximum number of occurrences of any character in the string p. For example, f(00110) = 3, f(01) = 1.

You need to find the sum  $f(s_l s_{l+1} \dots s_r)$  for all pairs  $1 \leq l \leq r \leq n$ .

### Input

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

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

The second line of each test case contains a string of length n, consisting of 0s and 1s — the binary string s.

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

## Output

For each test case, output the sum  $f(s_l s_{l+1} \dots s_r)$  for all pairs  $1 \leq l \leq r \leq n$ .

## Example

input	Сору
6	
1	
0	
0 2 01	
4	
0110	
6	
110001 8	
10011100	
11	
01011011100	
output	Сору
1	
3	
14	
40	
78	
190	

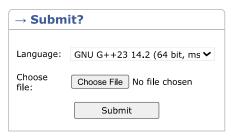
### Note

In the first test case, the string s has one substring, and the value f(0) = 1.

In the second test case, all substrings of the string s are 0, 01, 1. And the answer is 1+1+1=3, respectively.

In the third test case, all substrings of the string s are 0, 01, 011, 0110, 1, 11, 110, 1, 10, 0. And the answer is 1 + 1 + 2 + 2 + 1 + 2 + 2 + 1 + 1 + 1 = 14, respectively.





→ Last submissions		
Submission	Time	Verdict
324843820	Jun/17/2025 18:17	Accepted

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