

Problem J. Turn Off The Light

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 256 mebibytes

There are n lights aligned in a row. These lights are numbered 1 to n from left to right. Initially some of the lights are turned on. Chiaki would like to turn off all the lights.

Chiaki starts from the p -th light. Each time she can go left or right (i.e. if Chiaki is at x , then she can go to $x - 1$ or $x + 1$) and then press the switch of the light in that position (i.e. if the light is turned on before, it will be turned off and vice versa).

For each $p = 1, 2, \dots, n$, Chiaki would like to know the minimum steps needed to turn off all the lights.

Input

There are multiple test cases. The first line of input is an integer T indicates the number of test cases. For each test case:

The first line contains an integer n ($2 \leq n \leq 10^6$) – the number of lights.

The second line contains a binary string s where $s_i = 1$ means the i -th light is turned on and $s_i = 0$ means i -th light is turned off.

It is guaranteed that the sum of all n does not exceed 10^7 .

Output

For each test cases, output $(\sum_{i=1}^{|s|} i \times z_i) \bmod (10^9 + 7)$, where z_i is the number of step needed when Chikai starts at the i -th light.

Example

standard input	standard output
3	0
3	26
000	432
3	
111	
8	
01010101	