CODEFORCES
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HOME   TOP   CATALOG   CONTESTS   GYM   PROBLEMSET   GROUPS   RATING   EDU   API   CALENDAR   HELP

PROBLEMS   SUBMIT CODE   MY SUBMISSIONS   STATUS   HACKS   STANDINGS   CUSTOM INVOCATION

E. Long Inversions

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

A binary string s of length n is given. A binary string is a string consisting only of the characters '1' and '0'.

You can choose an integer k ($1 \le k \le n$) and then apply the following operation any number of times: choose k consecutive characters of the string and invert them, i.e., replace all '0' with '1' and vice versa.

Using these operations, you need to make all the characters in the string equal to '1'.

For example, if $n = 5$, $s = 00100$, you can choose $k = 3$ and proceed as follows:

- choose the substring from the 1-st to the 3-rd character and obtain $s = 11000$;
- choose the substring from the 3-rd to the 5-th character and obtain $s = 11111$;

Find the maximum value of k for which it is possible to make all the characters in the string equal to '1' using the described operations. Note that the number of operations required to achieve this is not important.

Input

The first line contains an integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains an integer n ($1 \le n \le 5000$) — the length of the string s.

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

It is guaranteed that the sum of the values n^2 over all test cases in the test does not exceed $25 \cdot 10^6$.

Output

For each test case, output the maximum integer k ($1 \le k \le n$) for which it is possible to obtain a string s consisting only of the characters '1' using the described operations.

Example

```
input

5
5
00100
5
01000
7
1011101
3
000
2
10
```

```
output

3
2
4
3
1
```

Codeforces Round 938 (Div. 3)
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

brute force   greedy   implementation
sortings

No tag edit access

→ Contest materials

- Announcement   ✕