F - Back and Forth Filling

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 500 points

Problem Statement

You are given an integer N and a string S of length $N-1$ consisting of L and R.

Consider writing integers into N cells arranged in a row so that the following conditions are satisfied:

- Every cell has one integer written on it.
- Every integer $1, 2, \ldots, N$ appears in exactly one cell.
- When the i-th character of S is L, $i+1$ is written to the left of i.
- When the i-th character of S is R, $i+1$ is written to the right of i.

Let C_i be the number of integers that can be written in the i-th cell from the left. Find $C_1, C_2, \ldots, C_N$.

You are given T test cases; find the answer for each of them.

Constraints

- $1 \leq T \leq 20000$
- $2 \leq N \leq 3 \times 10^5$
- S is a string of length $N-1$ consisting of L and R.
- For a single input, the sum of N does not exceed 3×10^5.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&T \\
&\mathrm{case}_1 \\
&\mathrm{case}_2 \\
&\vdots \\
&\mathrm{case}_T
\end{aligned}
$$

Each test case is given in the following format:

$$
\begin{aligned}
&N \\
&S
\end{aligned}
$$

Output

Print T lines.

The i-th line should contain the answer for the i-th test case in the following format:

$$C_1 \quad C_2 \quad \ldots \quad C_N$$

Sample Input 1 Copy

Copy

```
5
5
RLLR
3
RL
2
L
3
RR
20
RLLLLLLLLRLRRLLLRLR
```

Sample Output 1 Copy

Copy

```
2 4 3 4 2
2 2 1
1 1
1 1 1
5 9 13 14 15 17 18 19 19 20 20 19 19 18 17 16 14 12 9 5
```

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This input contains five test cases.

- For the first test case, there are 11 possible ways to fill the cells as follows:
  - $(1, 4, 3, 2, 5)$
  - $(1, 4, 3, 5, 2)$
  - $(1, 4, 5, 3, 2)$
  - $(4, 1, 3, 2, 5)$
  - $(4, 1, 3, 5, 2)$
  - $(4, 1, 5, 3, 2)$
  - $(4, 3, 1, 2, 5)$
  - $(4, 3, 1, 5, 2)$
  - $(4, 3, 5, 1, 2)$
  - $(4, 5, 1, 3, 2)$
  - $(4, 5, 3, 1, 2)$
- From this, each value of C_i is determined as follows:
  - The integers that can be written in the 1-st cell from the left are $1, 4$, which is two integers.
  - The integers that can be written in the 2-nd cell from the left are $1, 3, 4, 5$, which is four integers.
  - The integers that can be written in the 3-rd cell from the left are $1, 3, 5$, which is three integers.
  - The integers that can be written in the 4-th cell from the left are $1, 2, 3, 5$, which is four integers.
  - The integers that can be written in the 5-th cell from the left are $2, 5$, which is two integers.
- For the second test case, there are two possible ways to fill the cells as follows:
  - $(1, 3, 2)$
  - $(3, 1, 2)$
- For the third test case, there is one possible way to fill the cells as follows:
  - $(2, 1)$
- For the fourth test case, there is one possible way to fill the cells as follows:
  - $(1, 2, 3)$

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