

Wolf Game

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 1024 megabytes

There are n people standing in a row from left to right. Each person is either a villager or a werewolf. Villagers always tell the truth. Werewolves may tell either the truth or a lie. It is also known that no two adjacent people are both werewolves.

The statement of the i -th person is described by a pair (d_i, b_i) :

- if $d_i = \text{L}$, the person says that there are exactly b_i werewolves to their left;
- if $d_i = \text{R}$, the person says that there are exactly b_i werewolves to their right.

For each test case, construct any possible assignment of people to villagers and werewolves, or determine that no such assignment exists.

Input

The first line contains an integer T ($1 \leq T \leq 10^5$), the number of test cases.

Each test case consists of three lines. The first line contains an integer n ($2 \leq n \leq 5 \cdot 10^5$). The second line contains a string d of length n , consisting only of characters **L** and **R**. The third line contains n integers $b_1, b_2, \dots, b_n$ ($0 \leq b_i \leq n$).

The sum of n over all test cases does not exceed $5 \cdot 10^5$.

Output

For each test case, if there is no valid assignment, print **-1**.

Otherwise print a binary sequence of length n . The i -th value must be 0 if the i -th person is a villager, and 1 if the i -th person is a werewolf. You may print it either as one binary string or as n space-separated integers.

Example

standard input	standard output
3	001
3	-1
RLL	10101
1 0 0	
3	
RRR	
2 0 1	
5	
RRLRR	
1 2 1 1 0	