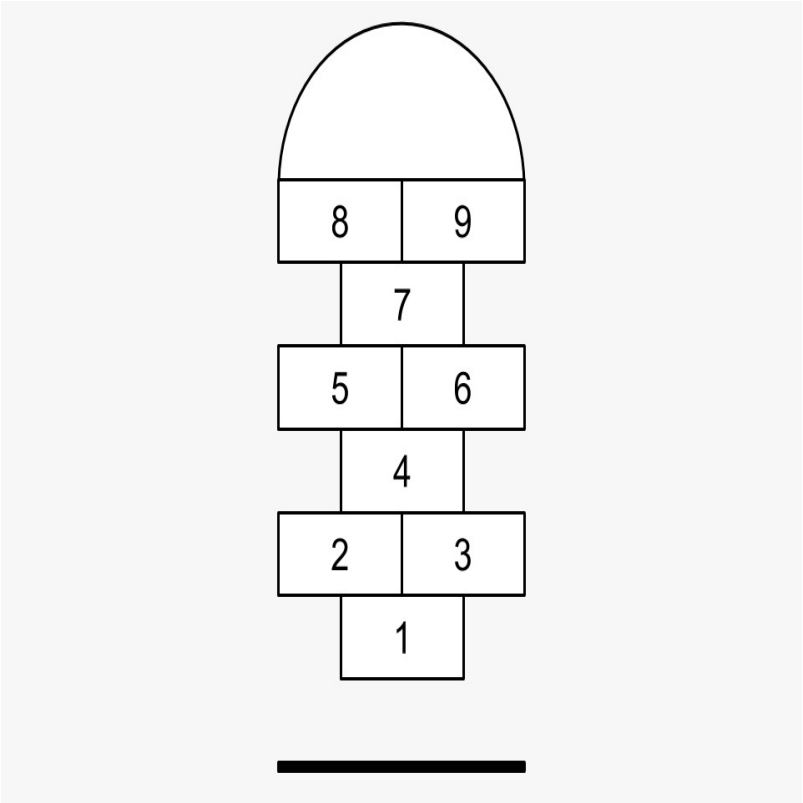
Hopscotch or Chappi Langdi being the great pastime game for many children has the following rules:



Six or nine squares drawn on the ground, inside where player will stand behind a defined line and toss a small piece of rock or pebble into a selected square, then they had to hop across the squares, skipping the one with the rock, completing the whole path uptill end and returning the same way. No stepping on lines, or you were considered out.

It was a beautiful day, Kukoo came to play Langdi (One Leg Hop) with her girl friends. Coinsidently, her school friend Gaitonde was present there too, climbed upon a tree, eating apples. Kukoo had a crush on him and maybe it was mutual. She wanted to talk to Gaitonde, but her friends wouldn't let her go in the middle of the game. Restricted by this situation, she decided to give him a signal or secret message, which only he can understand. Knowing Gaitonde also have a knack for encryption, she's convinced he can decode her message. So Kukoo decided as follows:

- Other than ordering the squares with their usual ascending order, she numbered them randomly.
- She skips the square in which the rock landed.
- Returning back is not counted.

Gaitonde knows, he has to use the number present inside square as data. Kukoo wrote a the key to decrypt the message in a piece of paper and throw near Gaitonde.

The Paper says:

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A node (x) will be considered to be counted, if it is the bottommost node at its
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`horizontal distance from the root. Horizontal distance of left child of a node (x) is equal to horizontal distance of (x) minus 1, and that of right child is horizontal distance of (x) plus 1. The final message will be a integer generated from a binary string including all the LSB (Least Significant Bit) of all those bottom (x)s.`

Gaitonde arranged those numbers as follows. But now he don't know what to do next. Help Gaitonde to find love.

Input:

First line takes Test Case **T**.
Second line contains an integer denoting the bottommost leaf node. Third line takes list of elements which has a data part and path.

For multiple test case, program will be run separately.

Output:

Show print a integer value of the decoded value with space separating different test cases.

Constraints:

1 ≤ **T** ≤ 30
0 ≤ **Max. Number of Nodes** ≤ 100
0 ≤ **Max. Data Size of Nodes** ≤ 1000

Example:

Input:

2
9
1 2 L 1 3 R 2 4 L 2 5 R 3 7 R 4 8 L 4 9 R
14
20 8 L 20 22 R 8 5 L 8 3 R 22 4 L 22 25 R 3 10 L 3 14 R

Output:

15 17

Case 1:

$(1)_{\text{horizontalDistance}} = +0$
$(2)_{\text{horizontalDistance}} = -1$
$(3)_{\text{horizontalDistance}} = +1$
$(4)_{\text{horizontalDistance}} = -2$
$(5)_{\text{horizontalDistance}} = +0$
$(7)_{\text{horizontalDistance}} = +2$
$(8)_{\text{horizontalDistance}} = -3$
$(9)_{\text{horizontalDistance}} = -1$

$(8)_{10} = (1000)_2 = (0)_{\text{LSB}}$
$(4)_{10} = (0100)_2 = (0)_{\text{LSB}}$
$(9)_{10} = (1001)_2 = (1)_{\text{LSB}}$
$(5)_{10} = (0101)_2 = (1)_{\text{LSB}}$
$(3)_{10} = (0011)_2 = (1)_{\text{LSB}}$
$(7)_{10} = (0111)_2 = (1)_{\text{LSB}}$

$(001111)_2 = (15)_{10}$

Case 2:

$(20)_{\text{horizontalDistance}} = +0$
$(\ 8)_{\text{horizontalDistance}} = -1$
$(22)_{\text{horizontalDistance}} = +1$
$(\ 5)_{\text{horizontalDistance}} = -2$
$(\ 3)_{\text{horizontalDistance}} = +0$
$(\ 4)_{\text{horizontalDistance}} = +0$
$(25)_{\text{horizontalDistance}} = +2$
$(10)_{\text{horizontalDistance}} = -1$
$(14)_{\text{horizontalDistance}} = +1$

$(\ 5)_{10} = (00101)_2 = (1)_{\text{LSB}}$
$(10)_{10} = (01010)_2 = (0)_{\text{LSB}}$
$(\ 4)_{10} = (00100)_2 = (0)_{\text{LSB}}$
$(14)_{10} = (01110)_2 = (0)_{\text{LSB}}$
$(25)_{10} = (11001)_2 = (1)_{\text{LSB}}$

$(10001)_2 = (17)_{10}$

(HINT):
If there are multiple bottommost nodes for a horizontalDistance from root, then the later one is

considered. e.g, 3 and 4 are both the bottommost nodes with horizontalDistance equals to zero.
