C	Card shuffle

Young Seven is playing a Card game with two of his friends. Each card has been labeled with a number and there is a card pile. At the beginning no card is in the pile. His friends can give Seven the following instructions:

1. **I H n**, put a card numbered with n at the top of the pile.
2. **I B n**, put a card numbered with n at the bottom of the pile.
3. **R H**, remove one card from the top of the pile.
4. **R B**, remove one card from the bottom of the pile.
5. **Q I**, ask Seven for the number of the I th card (counted from top to bottom) in the pile. (this instruction only appear when the pile is not empty)

Example: Pile situation after each instruction：

I H 1	1
I H 2	2 1
I B 3	2 1 3
I B 4	2 1 3 4
I H 5	5 2 1 3 4
Q 1	5 2 1 3 4
R H	2 1 3 4
Q 2	2 1 3 4

It is guaranteed that all instructions given are legal. Can you write a program for Seven to simulate the situation of the pile and output the needed result?

Input:

Input begins with a single integer T (1<T<50) in the first line to indicate the number of test cases. Then for each test case, the first line will give a integer I (2<I<100) to indicate number of instructions in this test case. The following I line will contain one instruction (in the given format) in each line.

Output:

For each “Q I” instruction, output the corresponding result in a single line.

Sample input	Sample output
2 6 I H 5 I B 4 I H 3 R B I B 6 Q 2 8 I H 1 I H 2 I H 3 R B Q 1 I B 4 R H Q 1	5 3 2