Problem F - Apple Juice Falls

Lucca realized that he has more tanks of apple juice than he knows what to do with, so he bought a forklift to move the tanks around.

Lucca has decided to make some abstract art with his tanks of apple juice.

Initially his tanks are in trapezoidal piles. Each pile has h layers with the bottom of the pile consisting of w tanks layed horizontally, while each layer above has one fewer tank on either side. For example here is a stack with $h = 3$ and $w = 7$.

```
  ***
 *****
*******
```

He's perpared a long straight segment to make his abstract art. Lucca is going to pick up the entire pile with his forklift and drop it from high up, possibly on top of other piles that he previously layed down. He drops them carefully to make sure his piles are aligned. For example, if he drops a pile on an existing pile:

```
        ***                    
       *****                   
      *******                **
      |||||||     =>        *****
 *******               ***********
*********             ************
```

Help Lucca determine the heights of his apple juice so he doesn't make any pile grow too high.

Input

Each test case begins with a single line containing a single integer $0 \leq q \leq 100,000$, representing the number events.

Each of the following q lines contain one of the following two types of events:

- $F\ x\ w\ h$: Lucca has dropped a pile of apple juice tanks with width w and height h, with the left most tank at position x ($1 \leq x, w, h \leq 100,000$, $w \geq 2h - 1$)
- $Q\ x$: a query for the height of the tanks at the x-th position ($1 \leq x \leq 100,000$).

Events occur in the order of input. Positions are 1-indexed.

Output

For each Q event, output the height of the specified apple juices.

Sample Input

```
1
24
F 1 3 1
Q 2
Q 3
F 2 5 3
Q 3
Q 4
F 5 2 1
Q 1000
Q 3
F 6 1 1
F 3 1 1
F 4 7 4
Q 1
Q 2
Q 3
Q 4
Q 5
Q 6
Q 7
Q 8
Q 9
Q 10
Q 11
Q 12
```

Sample Output

```
1
1
3
3
0
3
1
2
4
4
5
6
4
3
2
1
0
0
```