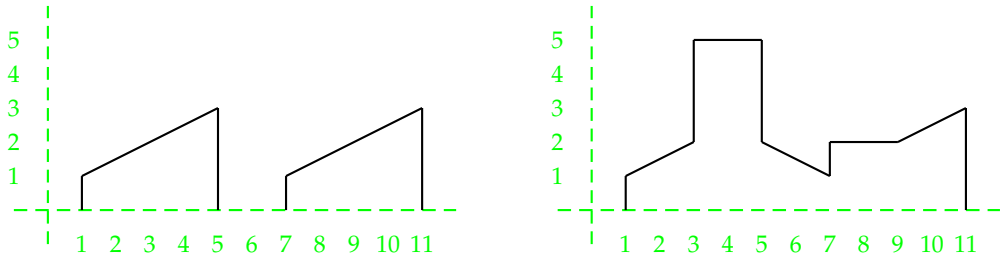
Building a wall — P27780_en

Quinzè Concurs de Programació de la UPC - Final (2017-09-13)

Let us use right trapezoids to build a wall. Each trapezoid is defined by four real parameters ℓ, r, y_ℓ and y_r, which indicate the points $(\ell, 0)$, (ℓ, y_ℓ), (r, y_r), and $(r, 0)$. For instance, adding the trapezoids (1 5 1 3) and (7 11 1 3) into an empty wall produces the figure to the left:



The material of the trapezoids is semifluid, so they adapt to the shape underneath. For instance, adding (3 9 3 0) to the figure to the left produces the figure to the right. Write a program to keep track of the shape of an initially empty wall, with two kind of operations:

- 'A' ℓ r y_ℓ y_r, to add a trapezoid as already explained.
- 'C' x, to consult the current height of the wall at the abscissa x.

Input

Input consists of several cases, each one with the number of operations n, followed by those operations. Assume $1 \leq n \leq 10^5$, that all given parametres are real numbers between 0 and 10^4, $\ell < r$, and that every x is different to all previous ℓ and r.

Output

For every 'C' operation, print the height at x with three digits after the decimal point. The input cases do not have precision issues.

Sample input

```
8
A 1 5 1 3
C 3
A 7 11 1 3
C 10
A 3 9 3 0
C 4
C 6.5
C 1000

3
A 0 10000 0 10000
A 1.2 3.4 100.7 23.42
C 2.789

1
C 10
```

Sample output

```
2.000
2.500
5.000
1.250
0.000
47.672
0.000
```

Problem information

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