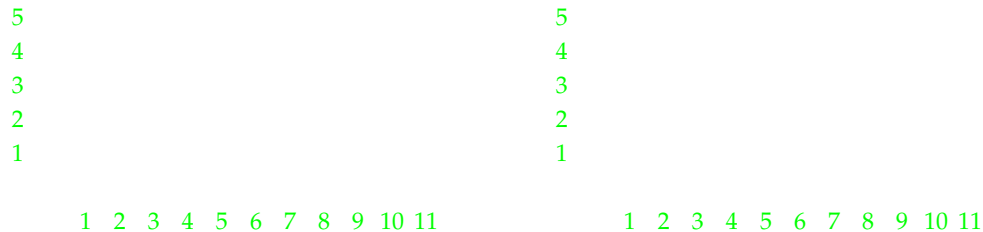


## Building a wall

P27780\_en

Let us use right trapezoids to build a wall. Each trapezoid is defined by four real parameters  $\ell$ ,  $r$ ,  $y_\ell$  and  $y_r$ , which indicate the points  $(\ell, 0)$ ,  $(\ell, y_\ell)$ ,  $(r, y_r)$ , 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'  $\ell$   $r$   $y_\ell$   $y_r$ , 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  $\ell$  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 1

```
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 1

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

**Problem information**

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