8167   Lunar Landscape

A satellite is surveying a possible rover landing area on the moon. The landing area is modeled as a square grid embedded in the standard coordinate system.

The satellite has taken n photos, each capturing a square area of the surface. Careful camera calibration has ensured that all photos are aligned with the grid — all four vertices have integer coordinates. Due to the satellite's changing orbit there are two types of photos:

- Photos of type A have sides that are parallel to coordinate axes. Such a photo is specified by giving the integer coordinates (x, y) of the square's middle point and the length of its side a — always an even integer.

- Photos of type B have sides at a 45° angle to the coordinate axes. Such a photo is specified by giving the integer coordinates (x, y) of the square's middle point and the length of its diagonal d — always an even integer.

Find the total surface area captured in the satellite photos.

Input

The input file contains several test cases, each of them as described below.

The first line contains an integer n $(1 \leq n \leq 200000)$ — the number of photos. The j-th of the following n lines is either of the form 'A x_j y_j a_j' or 'B x_j y_j d_j' representing a photo of type A or B, respectively. The x_j and y_j are the integer coordinates of the middle point of the photo $(-1000 \leq x_j, y_j \leq 1000)$. The a_j and d_j are even integers $(2 \leq a_j, d_j \leq 1000)$ — the side length and the diagonal length, respectively.
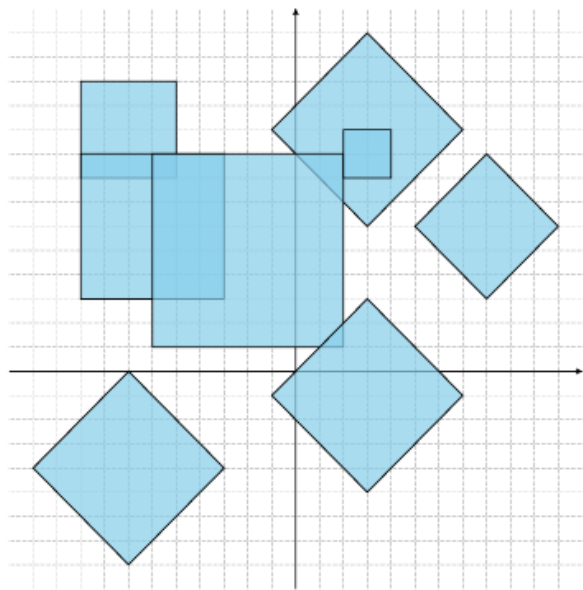
Output

For each test case, on a line by itself, output a number with exactly two digits after the decimal point — the total area of the surface. The answer has to exactly correspond to the judge's solution (no rounding errors are tolerated).

Note: Figures illustates the sample cases below.
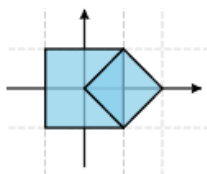
Sample Input

```
2
A 0 0 2
B 1 0 2
8
A -7 10 4
B 3 10 8
```

```
A -6 6 6
A -2 5 8
B 3 -1 8
B -7 -4 8
A 3 9 2
B 8 6 6
```

Sample Output

```
5.00
205.50
```