10084   Hotter Colder

The children's game *Hotter Colder* is played as follows. Player A leaves the room while player B hides an object somewhere in the room. Player A re-enters at position (0,0) and then visits various other positions about the room. When player A visits a new position, player B announces "Hotter" if this position is closer to the object than the previous position; player B announces "Colder" if it is farther and "Same" if it is the same distance.

Input

Input consists of up to 50 lines, each containing an x, y coordinate pair followed by 'Hotter', 'Colder', or 'Same'. Each pair represents a position within the room, which may be assumed to be a square with opposite corners at (0,0) and (10,10).

Output

For each line of input print a line giving the total area of the region in which the object may have been placed, to 2 decimal places. If there is no such region, output '0.00'.

Sample Input

```
10.0 10.0 Colder
10.0 0.0 Hotter
0.0 0.0 Colder
10.0 10.0 Hotter
```

Sample Output

```
50.00
37.50
12.50
0.00
```