Tune Me

There's a lot of music on FM radio; some of it makes you happy and some not so happy. If you pick a random FM frequency, what's your expected amount of happiness? I suppose it depends on what genres you like and how much of the dial they occupy.

The FM radio dial ranges in frequency from 87.9 MHz to 107.9 MHz. We'll assume that broadcasters assign musical genres g_i to disjoint subranges $[l_i, r_i]$, and listeners assign measures of happiness h_i to subranges (presumably based on their genres). In this problem, we input information about subranges and compute the expected amount of happiness.

Input Format

Each input line describes a subrange consisting of

- two real numbers l_i, r_i such that $87.9 \leqslant l_i < r_i \leqslant 107.9$—the subrange *bounds*
- a string g_i—the *genre* assigned to the subrange
- an integer $h_i \geqslant 0$—the *happiness* measure assigned to the subrange

Output Format

Given the input lines, compute and output the *expected happiness*

$$h = \sum_i h_i * (r_i - l_i)/(107.9 - 87.9)$$

and the genres that contribute the most and least to it. Expected happiness averages happiness contributions weighted by the fraction of the dial that they occupy. Output expected, most, and least happiness, accurate to two decimal places, as shown in the output sample. If two or more genres contribute equally to h, output the one that would appear first in dictionary order. For example, the genres `jazz` and `rock` contribute the same amount of happiness in the example below.

Input Sample

```
88.1 93.1 jazz 56
97.5 99.5 rock 80
101.1 104.5 news 50
105.1 107.1 rock 60
94.9 96.1 rap 10
```

Output Sample

```
expected happiness: 37.10
most happiness: 14.00 from jazz
least happiness: 0.60 from rap
```