Problem 231: Collision Flare Gun

Difficulty: Easy

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Problem Background

Lockheed Martin is testing two new compounds, with a consistency very similar to clay, that when they come into contact will ignite after a short delay and produce a very bright blue light capable of illuminating a large area and that can be visible from miles away. Since neither compound is hazardous on its own, it's hoped that this binary approach will be safer for use on ships compared to the flammable materials currently used to make flares.

The tests have now moved on to various delivery methods that could potentially replace traditional flares in large ship vessels. You have been assigned to assist with one called the "collision flare gun." Two synchronized pneumatic guns will shoot the compounds into the air with predefined trajectories that will make them collide at a known point; as a result, they will ignite in the air after a short delay.

Problem Description

Once the compounds collide, we need to know their final velocity so we can know where exactly they will be in the air as they ignite. Using the formula for inelastic collisions below, your team needs to write a program that can determine this final velocity of the mixed compound given the initial velocities (v_1 and v_2) and masses (m_1 and m_2) of the two original compounds.

$$V = \frac{m_1 v_1 + m_2 v_2}{m_1 + m_2}$$

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include a single line, containing the following values separated by commas:

- A decimal value representing v_1, the initial velocity of the first compound in meters/second
- A decimal value representing m_1, the mass of the first compound in kilograms
- A decimal value representing v_2, the initial velocity of the second compound in meters/second
- A decimal value representing m_2, the mass of the second compound in kilograms

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3
1,2,3,4
1,2.5,1.2,2.5
1.1,2.2,3.3,4.4
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Sample Output

For each test case, your program must print a single line containing the final velocity, in meters per second, of the combined mass. Round values to two decimal places and include any trailing zeroes.

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2.33
1.10
2.57
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