Math Diversion 928

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"Can I have a motorcycle when I get old enough?"
"If you take care of it."
"What do you have to do?"
"Lot's of things. You've been watching me."
"Will you show me all of them?"
"Sure."
"Is it hard?"
"Not if you have the right attitudes. It's having the right attitudes that's hard."
— Robert Pirsig to his son, from *Zen and the Art of Motorcycle Maintenance*

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Source: http://www.weber.edu/wsuimages/MTC/Handouts/Mixture
                %20Problems%20Handout_WEllis.pdf
Title: A mixed-rate problem
 Presenter: Patrick
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1 The Problem

Suppose a store keeper wants to make a mixture of cashews and peanuts. He has on hand peanuts that cost \$3 per pound and cashews that cost \$5.50 per pound. He wants to make a 3 pound mixture that costs \$4 per pound.

And accompanying figure

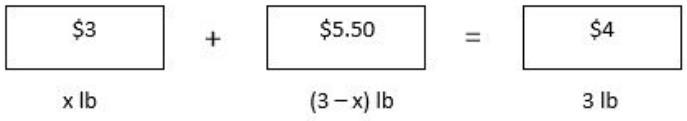

Figure 1. Figure was imported from word problem in handout.

2 Solution

By contrast, the equivalent figure suggested by Scheme would be:

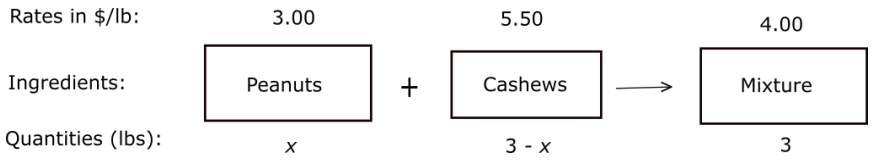

Figure 2. The Scheme version of the previous figure.

In a standard Scheme figure, rates are on top, quantities are on the bottom, and names, or identifiers, are inside the rectangles.

So, how do we proceed? We balance on the cost in the before-and-after process:

$$3.00x + 5.50(3 - x) = 4.00(3)\,, \tag{1}$$

which has solution

$$x = \frac{5}{4} = 1.8\,. \tag{2}$$

You can think of Scheme as a form of object-oriented construction in which the figure has objects (in this case peanuts, cashews, mixture) and the objects have data (in this case rates in $/lb and quantities in lbs). And all this object-data is separated into column form for ease of reference.