The Universe of Discourse

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Monads are like burritos

A few months ago Brent Yorgey complained about a certain class of tutorials which present monads by explaining how monads are like burritos.

At first I thought the choice of burritos was only a facetious reference to the peculiar and sometimes strained analogies these tutorials make. But then I realized that monads *are* like burritos.

I will explain.

A monad is a special kind of a functor. A functor *F* takes each type *T* and maps it to a new type *FT*. A burrito is like a functor: it takes a type, like meat or beans, and turns it into a new type, like beef burrito or bean burrito.

A functor must also be equipped with a `map` function that lifts functions over the original type into functions over the new type. For example, you can add chopped jalapeños or shredded cheese to any type, like meat or beans; the lifted version of this function adds chopped jalapeños or shredded cheese to the corresponding burrito.

A monad must also possess a `unit` function that takes a regular value, such as a particular batch of meat, and turns it into a burrito. The `unit` function for burritos is obviously a tortilla.

Finally, a monad must possess a `join` function that takes a ridiculous burrito of burritos and turns them into a regular burrito. Here the obvious join function is to remove the outer tortilla, then unwrap the inner burritos and transfer their fillings into the outer tortilla, and throw away the inner wrappings.

The `map`, `join`, and `unit` functions must satisfy certain laws. For example, if *B* is already a burrito, and not merely a filling for a burrito, then `join`(`unit`(*B*)) must be the same as *B*. This means that if you have a burrito, and you wrap it in a second tortilla, and then unwrap the contents into the outer tortilla, the result is the same as what you started with.

This is true because tortillas are indistinguishable.

I know you are going to point out that some tortillas have the face of Jesus. But those have been toasted, and so are unsuitable for burrito-making, and do not concern us here.

So monads are indeed like burritos.

I asked Brent if this was actually what he had in mind when he first suggested the idea of tutorials explaining monads in terms of burritos, and if everyone else had understood this right away.

But he said no, I was the lone genius.

[Addendum 20120106: Chris Done has presented this theory in cartoon form.]

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