An Intro to Functional Programming

A Better Way to Program if you like Math and Stuff

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What is Functional Programming?

Functional Programming has several definitions.

- Programming in regards to purity, and in particular, how programming relates to mathematics
- Programming with functions.

But Tom, I already program with functions!

You actually program with subroutine. There are a few differences:

- In mathematics, you can always expect the same result when supplying the same argument, following an $f(x) = y$ pattern
- In most C-style programming languages, you cannot pass functions around like variables.

Ok, so what's the big deal about math?

If you utilize math, you can exploit a few useful properties.

- Composition:

$$f(g) = f \circ g = h$$

- Partial Application

$$g = f(5, x)$$

Let the computer write the code for you.

- Writing instructions for the computer to follow is not fun.
- Instead, describe what you want the computer to do, not every step of how you want it done.

Lodash!

JavaScript actually allows for both of these properties (and a lot more) using the excellent Lodash library.

```
_.compose
var realNameMap = {
'pebbles': 'penelope'
};

var format = function(name) {
name = realNameMap[name.toLowerCase()] || name;
return name.charAt(0).toUpperCase() + name.slice(1).toLowerCase();
};

var greet = function(formatted) {
return 'Hiya ' + formatted + '!';
};

var welcome = _.compose(greet, format);
welcome('Penelope');
//      'Hiya Penelope!'
```

Lodash!

JavaScript actually allows for both of these properties (and a lot more) using the excellent Lodash library.

```
var greet = function(greeting, name) {
  return greeting + ' ' + name;
  };
var hi = _.partial(greet, 'hi');
hi('fred');
//      'hi fred
```

Questions?