WHAT IS FUNCTIONAL PROGRAMMING?

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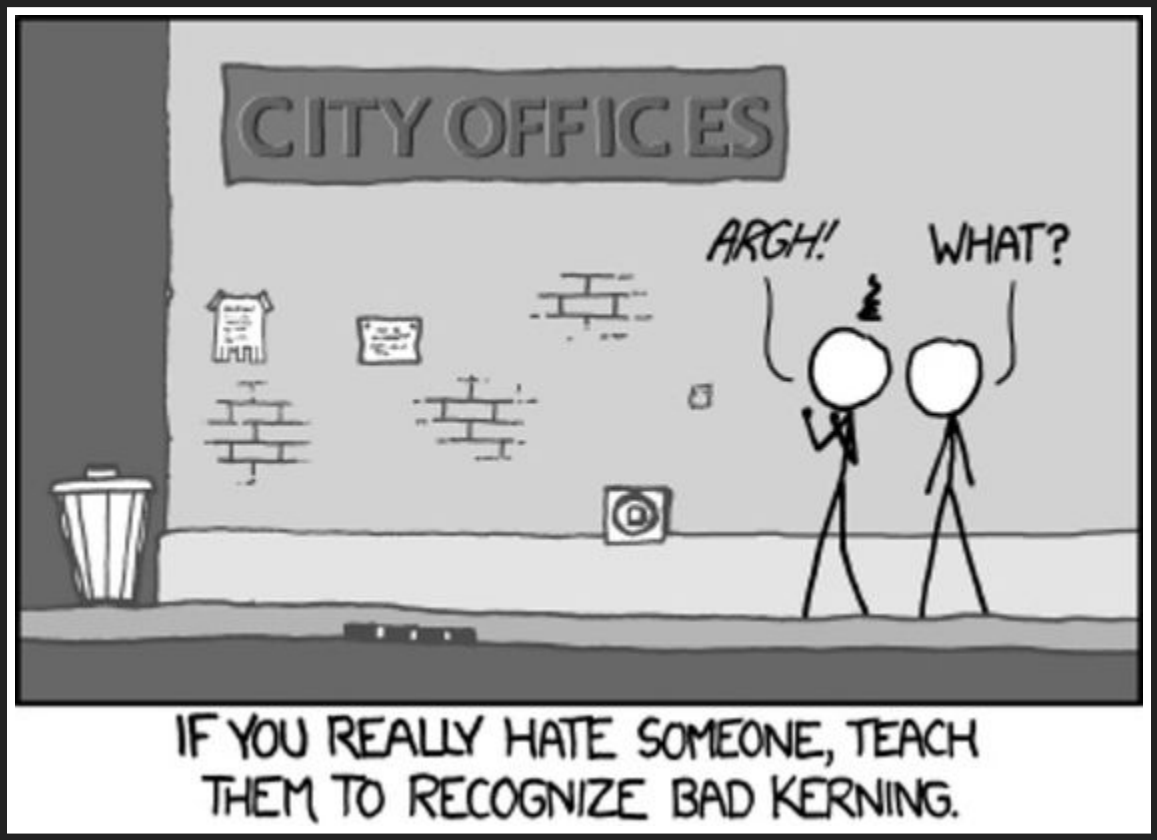
FIRST, DO SOME HARM



EVERY FUNCTION YOU WRITE

…has two sets of inputs & outputs.

THE FAMILIAR PAIR

```
public int add(int x, int y) {
  return x + y;
}
```

THE HIDDEN PAIR

```
public boolean processMessages(int n) {
  int count = InboxManager.process(n);

  return (count >= 1);
}
```

HIDDEN INPUTS AND OUTPUTS

Are called 'side-effects'.

HIDDEN INPUTS AND OUTPUTS

Are called 'side-causes' and 'side-effects'.

A SIDE-EFFECT SPOTTER'S GUIDE

SPOT THE SIDE-EFFECT

```
todoList.remaining = function() {
    var count = 0;
    angular.forEach(todoList.todos, function(todo) {
        count += todo.done ? 0 : 1;
    });
    return count;
};
```

SPOT THE SIDE-CAUSE

```
todoList.addTodo = function() {
    todoList.todos.push({text:todoList.todoText, done:false});
    todoList.todoText = '';
};
```

SIDE-EFFECTS DESTROY

SIDE-EFFECTS DESTROY TESTING

There are no black boxes any more.

SIDE-EFFECTS DESTROY COMPONENTS

Nothing exists in isolation.

SIDE-EFFECTS DESTROY COMPOSITION

Things cannot be plugged together.

SIDE-EFFECTS ARE THE COMPLEXITY ICEBERG

```
public boolean processMessage(Queue queue) {...}
```

SO, WHAT IS FUNCTIONAL PROGRAMMING?

FUNCTIONAL PROGRAMMING IS

- Eliminating side-effects where you can.
- Controlling them where you can't.
- So that every component describes a relationship between its inputs and outputs.

FUNCTIONAL PROGRAMMING IS

Eliminating & controlling side-effects.

FUNCTIONAL PROGRAMMING ENABLES

- Easier reasoning
- Easier testing.
- Easier reuse.
- Easier concurrency.

WAIT, YOU DIDN'T MENTION...

MAP, REDUCE, FOLD ...

HIGHER ORDER FUNCTIONS

MONADS

LOTS OF OTHER THINGS

ONE MORE TIME

FP

Functional Programming is about eliminating side-effects where you can, controlling them where you can't.

THANK YOU

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