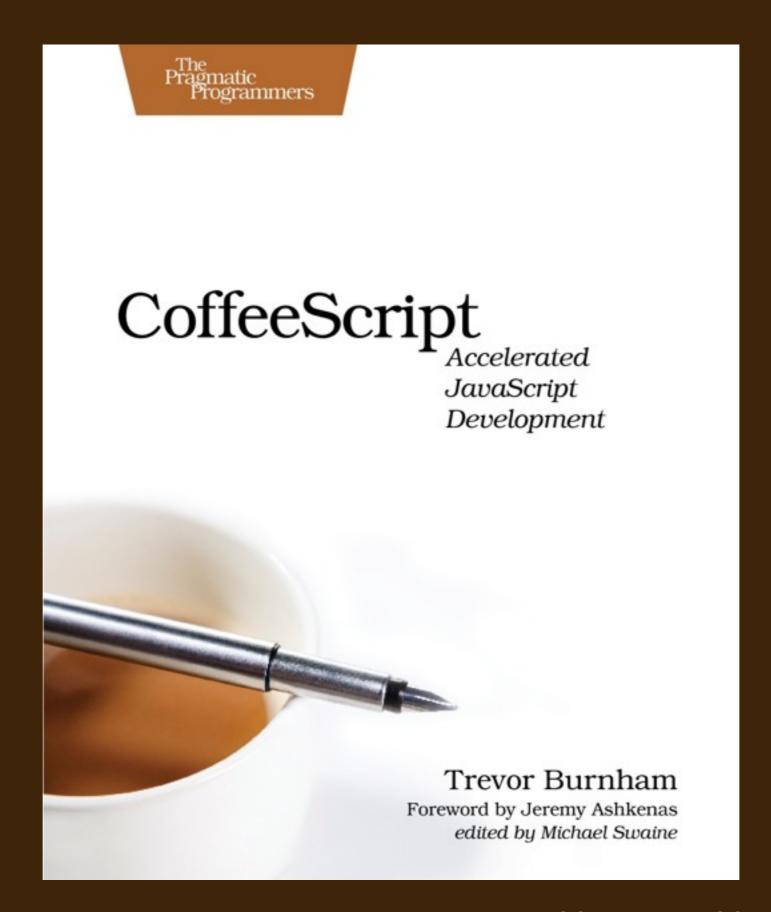
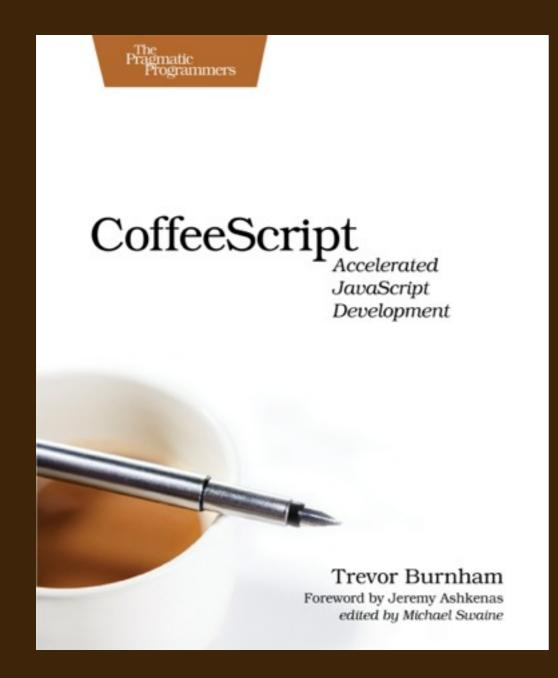
# The CoffeeScript Edge

Presented by Trevor Burnham at Philly ETE 2012





http://pragprog.com/book/tbcoffee/coffeescript



"This book helps readers become better JavaScripters in the process of learning CoffeeScript. What's more, this book is a blast to read."

—Brendan Eich

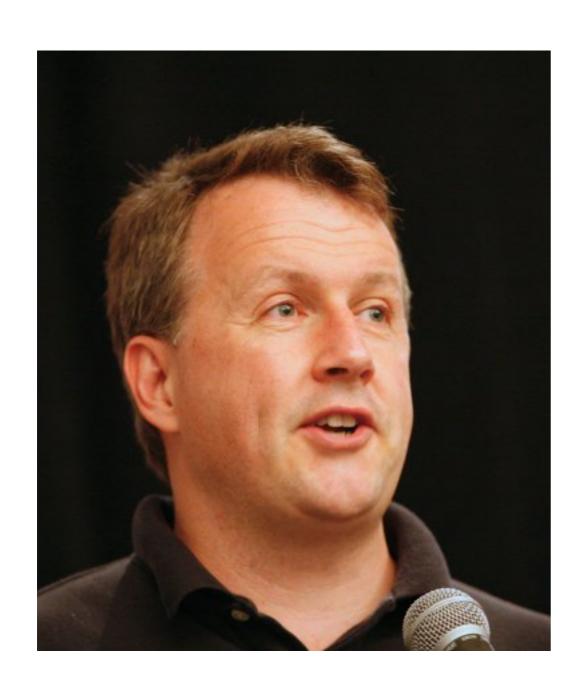
http://pragprog.com/book/tbcoffee/coffeescript

# Preface The Compleat History of JavaScript

# 1995 to 2003: Ancient JavaScript



# Paul Graham on JavaScript:



### Paul Graham on JavaScript:



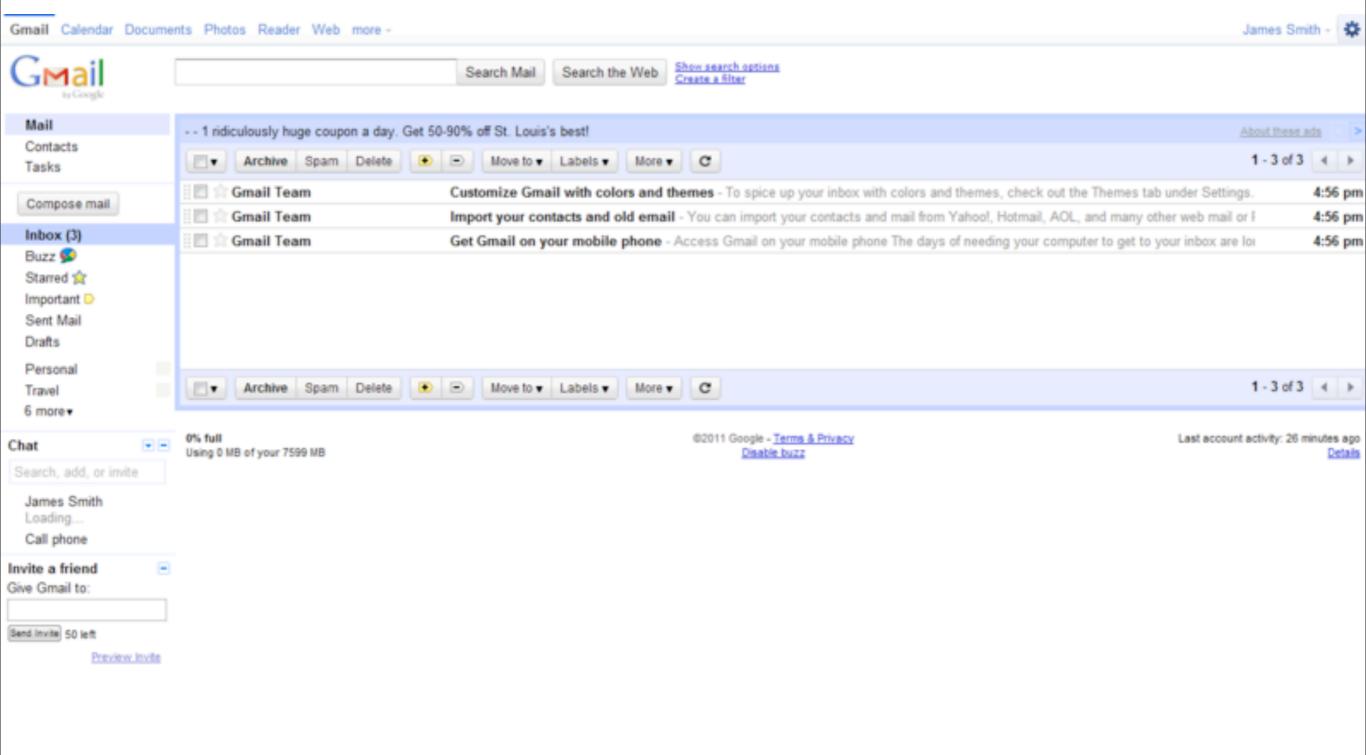
"I would not even use Javascript, if I were you... Most of the JavaScript I see on the Web isn't necessary, and much of it breaks."

("The Other Road Ahead," 2001)

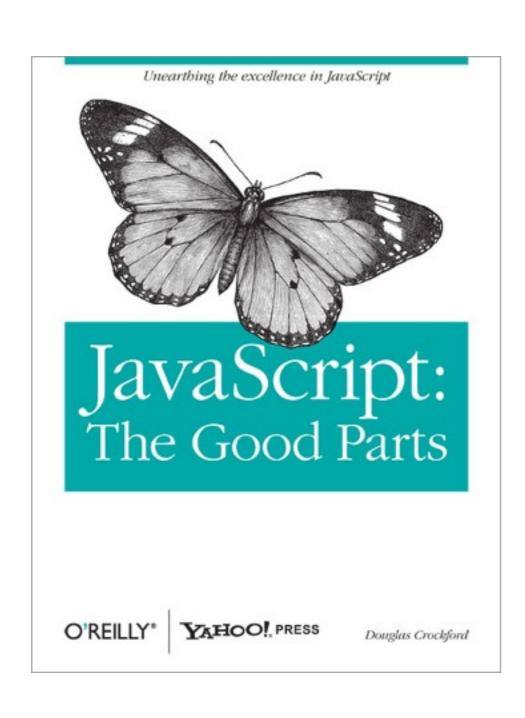
# 2004-2008: Medieval JavaScript



# Ajax!



#### Crockford!





#### Solid libraries!

#### Solid libraries!

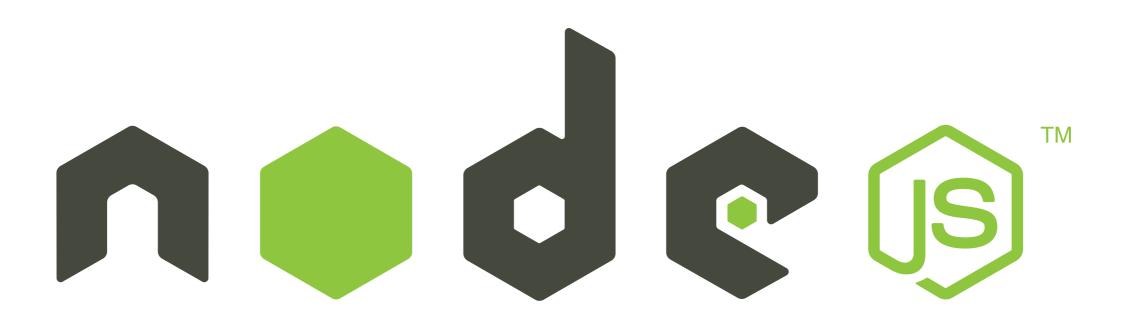


...And probably others!

# 2009-: Modern JavaScript



# JavaScript on the Server

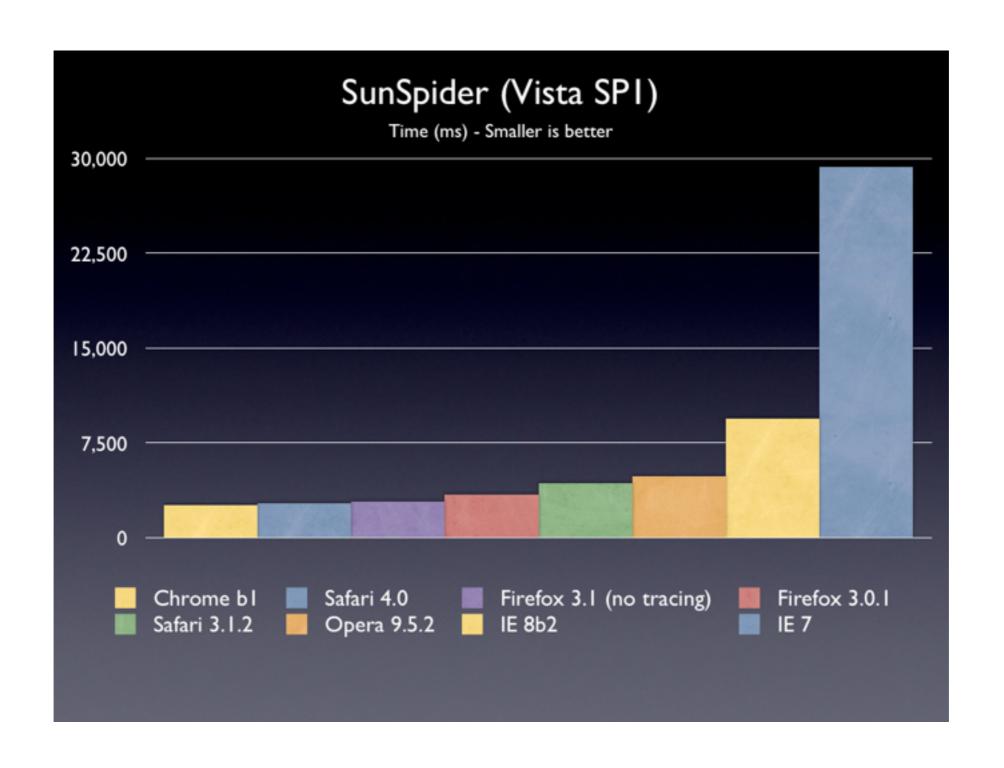


# JavaScript as an Embedded Scripting Language





# JavaScript is Now FAST!



# The New First Language?



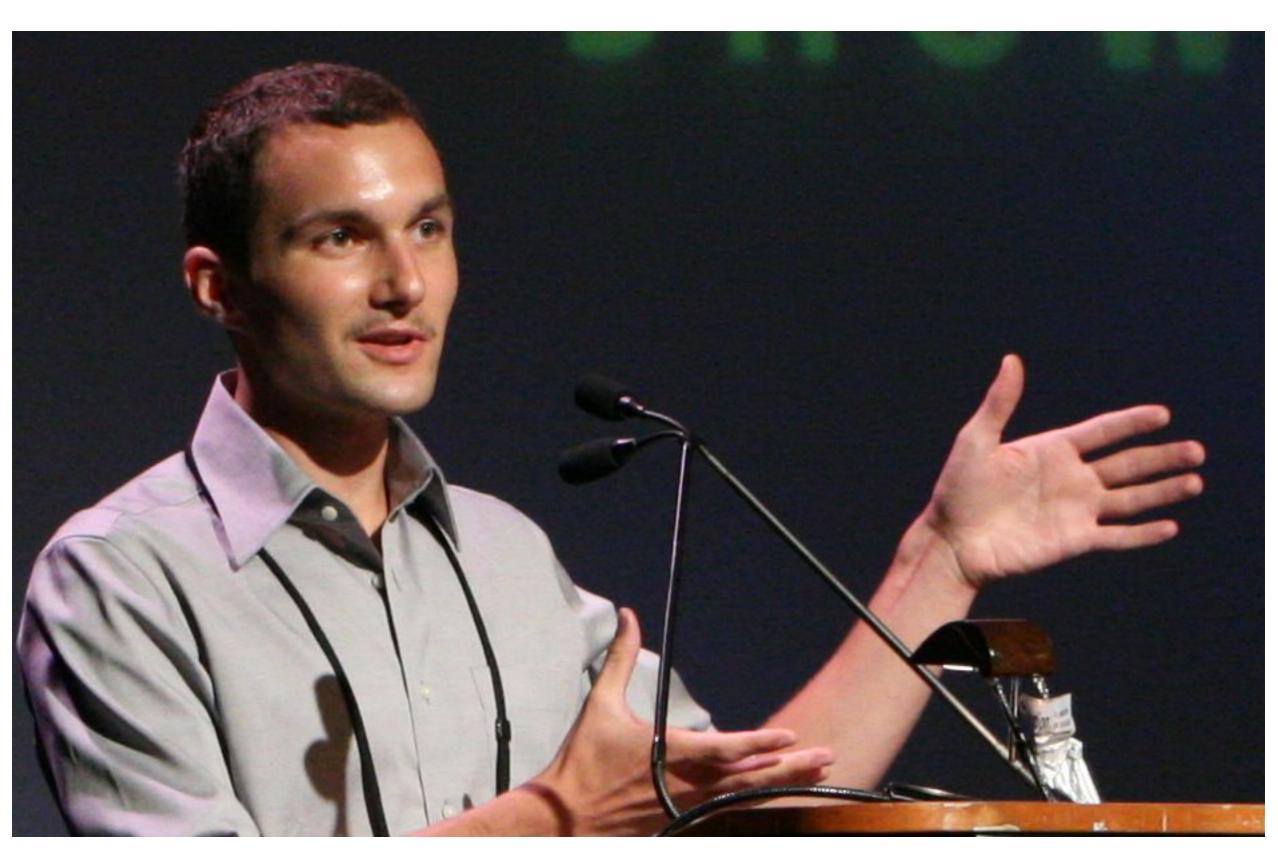
http://www.codecademy.com/

# Everyone Who Knows JavaScript Feels Like Superman!





# "A Little Language"



Christmas 2009: First announced on HN

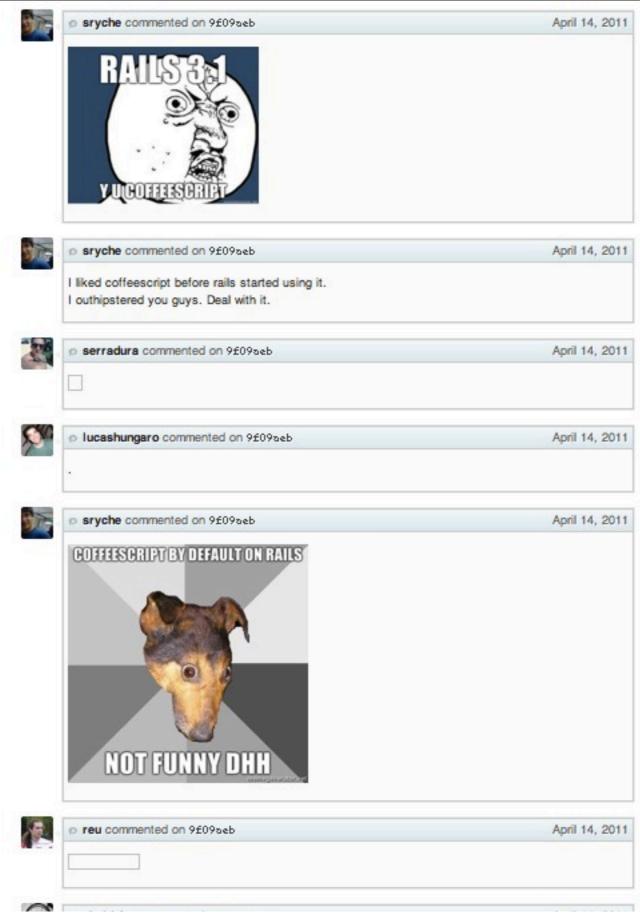
Christmas 2009: First announced on HN

Christmas 2010: 1.0 Released

Christmas 2009: First announced on HN

Christmas 2010: 1.0 Released

April 13, 2011: Added to Ruby on Rails



#### https://github.com/rails/rails/commit/9f09aeb8273177fc2d09ebdafcc76ee8eb56fe33

#### David Heinemeier Hansson



Been writing a bunch more CoffeeScript lately. It's only getting better and nicer. What a leap forward for JavaScript.

4 Nov via Tweetie for Mac A Favorite 13 Retweet A Reply

# Ward Cunningham



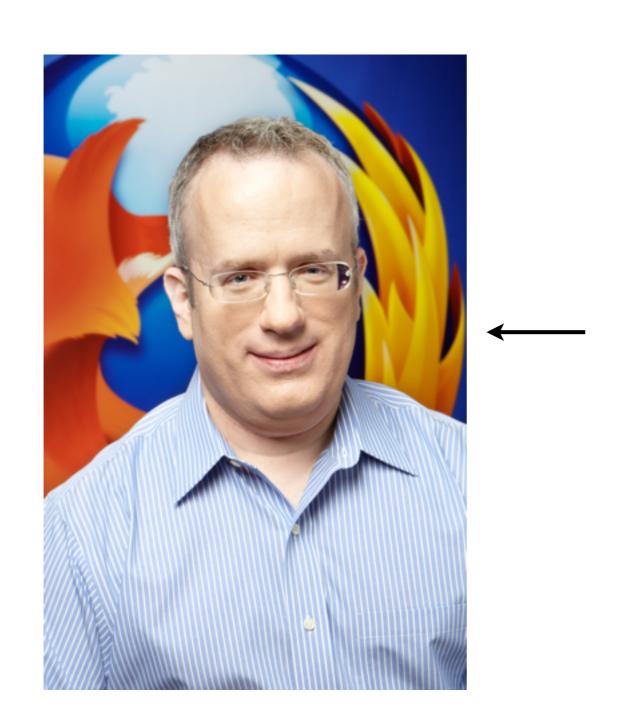
# Ward Cunningham



"CoffeeScript and the environment will all the powerful browsers is the closest I felt to the power I had twenty years ago in Smalltalk."

—Interview with InfoQ, November 2011

# Brendan Eich (!)

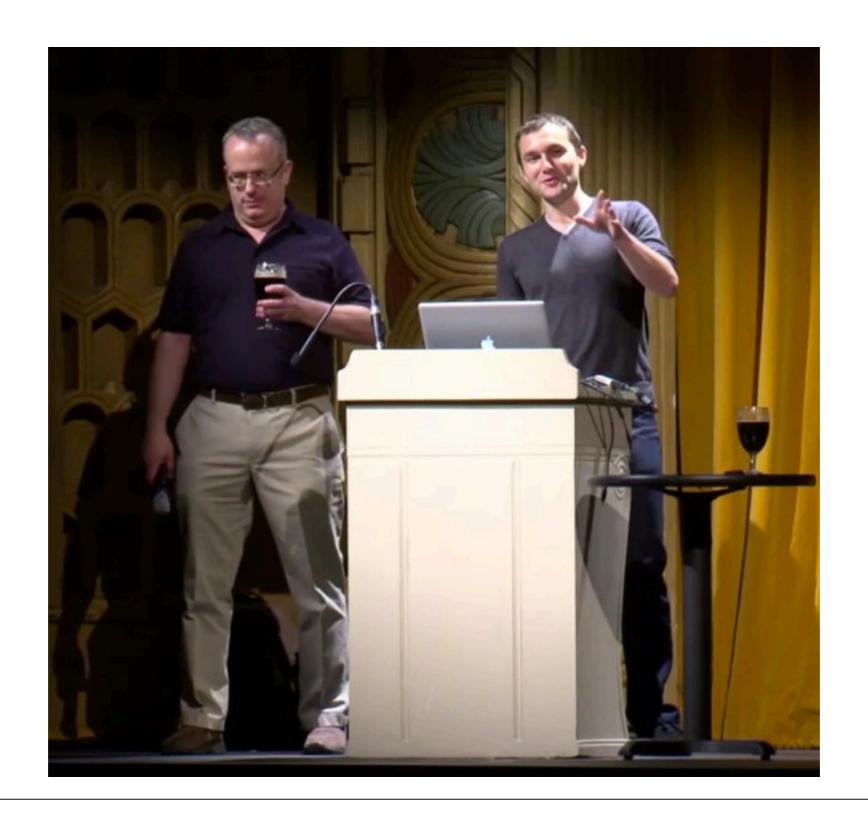


## Brendan Eich (!)



— CoffeeScript user

#### Eich + Ashkenas at JsConf 2011



#### Who uses it?













https://github.com/jashkenas/coffee-script/wiki/In-The-Wild

#### Ponder This...

CoffeeScript is the #12 most popular language on GitHub

https://github.com/languages/CoffeeScript

CoffeeScript: A Bird's-Eye View

# Things CoffeeScript Isn't:

Ruby/Python

Ruby/Python

jQuery

Ruby/Python

jQuery

**GWT** 

Ruby/Python

jQuery

**GWT** 

Dart

Ruby/Python

jQuery

**GWT** 

Dart

alert 'Hello World!' # 1 Line!!!

$$a = b$$
 # var  $a = b$ ;

```
a = b # var a = b;
x is y # x === y;
```

```
a = b  # var a = b;

x is y  # x === y;

f arg  # f(arg);
```

```
a = b  # var a = b;

x is y  # x === y;

f arg  # f(arg);

f = -> x
# var f = function() {return x;};
```

```
a = b  # var a = b;
x is y  # x === y;
f arg  # f(arg);
f = -> x
# var f = function() {return x;};
```

No standard library. No additional types. Nothing but sweet, sweet syntax!

### Ruby-isms

### Ruby-isms

```
"That costs $#{price}"
# "That costs $" + price
```





CoffeeScript has Ruby-style string interpolation?! my God this thing is so sweet I almost can taste it!

8:16 AM - 27 Jun 11 via Twitter for Mac · Embed this Tweet



### Streamlined Literals (I)

#### Streamlined Literals (I)

```
"Commas?"
"We"
"don't"
"need"
"no"
"stinking"
"commmas!"
```

### Streamlined Literals (II)

#### Streamlined Literals (II)

```
outer:
  inner:
    "You got YAML in my JSON!"
{outer:
  {inner:
    "You got YAML in my JSON!"
```

```
obj = \{x\} \# obj = \{x: x\};
```

```
obj = \{x\} # obj = \{x: x\};
\{x\} = obj # x = obj.x;
```

```
obj = {x} # obj = {x: x};

{x} = obj # x = obj.x;

func = ({x}) ->
func = function(o) {
  var x = o.x;
}
```

```
f() if z # if (z) { f(); }
```

```
f() if z # if (z) { f(); }
f?() # if (...) { f(); }
```

```
f() if z # if (z) { f(); }
f?() # if (...) { f(); }
obj? # obj != null;
```

```
f() if z # if (z) { f(); }

f?() # if (...) { f(); }

obj? # obj != null;

x ? y # x != null ? x : y;
```

```
f() if z # if (z) { f(); }
f?() # if (...) { f(); }
obj? # obj != null;
x ? y # x != null ? x : y;
```

Plus, significant whitespace...

### The Beauty of Indentation

source: <a href="https://github.com/TrevorBurnham/connect-assets">https://github.com/TrevorBurnham/connect-assets</a>

### The Beauty of Indentation

source: <a href="https://github.com/TrevorBurnham/connect-assets">https://github.com/TrevorBurnham/connect-assets</a>

```
for ext in exts
  sourcePath = stripExt(route) + ".#{ext}"
  try
  stats = fs.statSync @absPath(sourcePath)
  if ext is 'css'
    {mtime} = stats
    if timeEq mtime, @cache.map[route]?.mtime
       css = @cache.map[route].data
    else
    css = fs.readFileSync @absPath(sourcePath)
```

### The Curly-Braced Equivalent

### The Curly-Braced Equivalent

```
var css, ext, mtime, sourcePath, stats, _i, _len, _ref;
for (_i = 0, _len = exts.length; _i < _len; _i++) {</pre>
  ext = exts[ i];
  sourcePath = stripExt(route) + ("." + ext);
  try {
    stats = fs.statSync(this.absPath(sourcePath));
    if (ext === 'css') {
      mtime = stats.mtime;
      if (timeEq(mtime, ( ref = this.cache.map[route]) !=
null ? ref.mtime : void ∅)) {
        css = this.cache.map[route].data;
      } else {
        css = fs.readFileSync(this.absPath(sourcePath));
  } catch (_e) {}
```



ll Language Features

### The Wrapper

### The Wrapper

```
CoffeeScript in: console.log i for i in arr
```

#### JavaScript out:

```
(function() {
  var i, _i, _len;
  for (_i = 0, _len = arr.length; _i < _len; _i++) {
    i = arr[_i];
    console.log(i);
  }
}).call(this);</pre>
```

### Why Use The Wrapper?

source: <a href="http://stackoverflow.com/questions/5211638/">http://stackoverflow.com/questions/5211638/</a>

#### Pattern for CoffeeScript modules



While reviewing the source code for CoffeeScript on Github, I noticed that most, if not all, of the modules are defined as follows:



(function() { }).call(this);



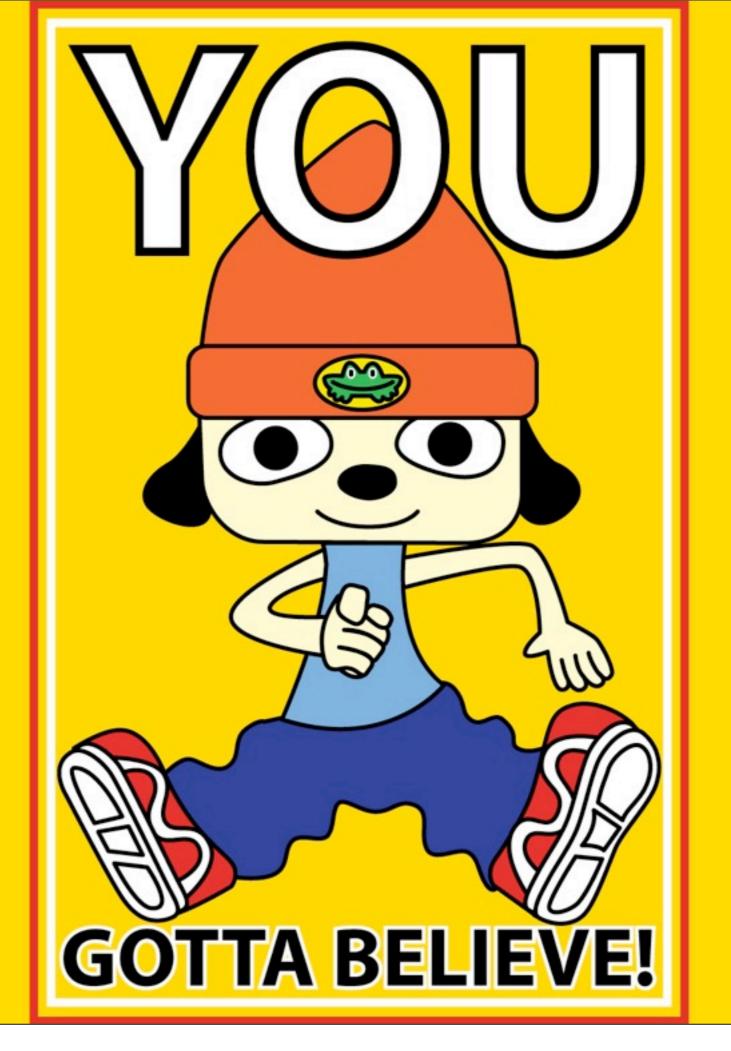
This pattern looks like it wraps the entire module in an anonymous function and calls itself.

What are the pros (and cons) of this approach? Are there other ways to accomplish the same goals?

javascript node.js coffeescript

link | edit | close | flag





Conditionals

Conditionals

**Parentheses** 

Conditionals

**Parentheses** 

**Objects** 

Conditionals

**Parentheses** 

Objects

Loops

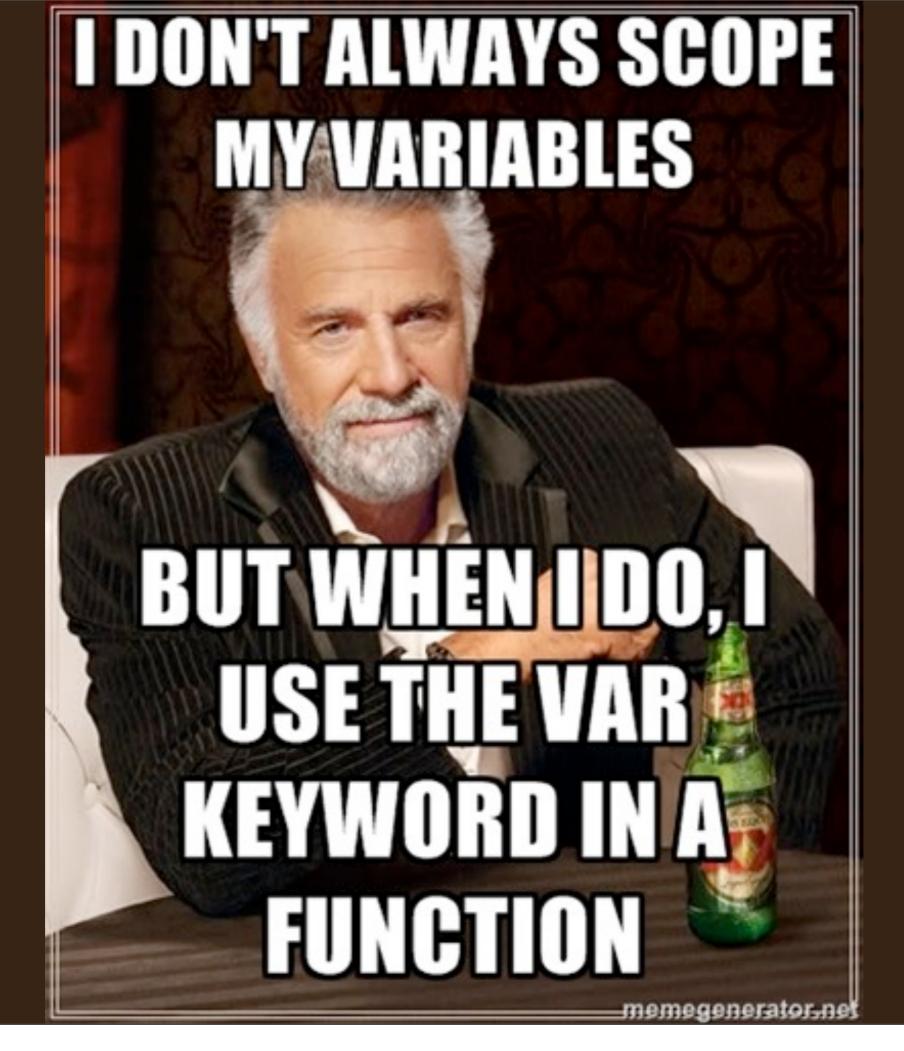
Conditionals

**Parentheses** 

Objects

Loops

Files (!)



## Don't Let This Happen to You!



#### How One Missing `var` Ruined our Launch

Well, that was a veritable shitstorm (sorry for the language). Long story short, <a href="MelonCard">MelonCard</a> was featured today on TechCrunch (along with other 500Startups companies, also on <a href="VentureBeat">VentureBeat</a>, <a href="Forbes">Forbes</a>, <a href="MoleonCard">MelonCard</a> over the last few days to make our site a seamless "everything just updates" look-good / feel-good product using <a href="NodeIS">NodeIS</a> long-polling with a slick <a href="KnockoutJS">KnockoutJS</a> dynamic jQuery Templates front end. We did our due diligence of manual and unit testing, mixed with a full suite of <a href="Yows">Yows</a> for Node. All systems check, full steam ahead, right? Not so fast.

Our system in NodeJS takes input from a user describing his state, say "I am waiting on these two records to be updated," and the server (based on a timestamp check) returns back either "Your records are up to date" or "Record xxx has changed to yyy." (It's actually a bit more complicated with Redis shared variables, sessions and other security checks to interface between Rails, mySQL, Redis, and Node). It's beautiful simple, but even simple code in NodeJS can be hell when things don't go quite as planned. That happened today.

After the articles dropped today, we faced a moderate load of excited users (let's say 50-100 new users over an hour period). All of a sudden, everything went haywire. No pages worked any more; our inboxes started to fill up with "Your product just hangs." I grabbed a coffee and readied for battle.

http://blog.meloncard.com/post/12175941935

## CoffeeScripters Need No var!

## CoffeeScripters Need No var!

console.log i for i in arr

```
(function() {
  var i, _i, _len;
  for (_i = 0, _len = arr.length; _i < _len; _i++) {
    i = arr[_i];
    console.log(i);
  }
}).call(this);</pre>
```

Parappa the Wrapper



Parappa the Wrapper



Proper Indentation

Parappa the Wrapper



Proper Indentation

Avoiding ==

Parappa the Wrapper



Proper Indentation

Avoiding ==

Packaging extensible objects as "classes"

```
lifeEtAl =
  answer: 42
  showAnswer: ->
  console.log @answer # @ == this
```

```
lifeEtAl =
  answer: 42
  showAnswer: ->
  console.log @answer # @ == this

lifeEtAl.showAnswer()
```

```
lifeEtAl =
   answer: 42
   showAnswer: ->
      console.log @answer # @ == this

lifeEtAl.showAnswer()

setTimeout lifeEtAl.showAnswer, 10
```

### JAVASCRIPT



### Y U NO BIND FUNCTIONS???

memegenerator.net

```
class LifeEtAl
  answer: 42
  showAnswer: => # fat ->
  console.log @answer
```

```
class LifeEtAl
  answer: 42
  showAnswer: => # fat ->
    console.log @answer

myLife = new LifeEtAl
```

```
class LifeEtAl
   answer: 42
   showAnswer: => # fat ->
      console.log @answer

myLife = new LifeEtAl

setTimeout myLife.showAnswer, 10
```

```
class LifeEtAl
  answer = 42
  showAnswer: ->
  console.log answer
```

```
class LifeEtAl
  answer = 42
  showAnswer: ->
    console.log answer

myLife = new LifeEtAl
```

```
class LifeEtAl
   answer = 42
   showAnswer: ->
      console.log answer

myLife = new LifeEtAl

setTimeout myLife.showAnswer, 10
```

## Using a Constructor

## Using a Constructor

```
class Circle
  twoPi = Math.PI * 2
  constructor: (@radius) ->
    @radiusSqr = Math.pow @radius, 2
  diameter: => twoPi * @radius
  area: => Math.PI * @radiusSqr
```

### Using a Constructor

```
class Circle
  twoPi = Math.PI * 2
  constructor: (@radius) ->
    @radiusSqr = Math.pow @radius, 2
  diameter: => twoPi * @radius
  area: => Math.PI * @radiusSqr
c = new Circle(5)
console.log c.diameter() # 31.4159
console.log c.area() # 78.5398
```

## Let's Try a Little Inheritance

## Let's Try a Little Inheritance

class Document extends Backbone.Model

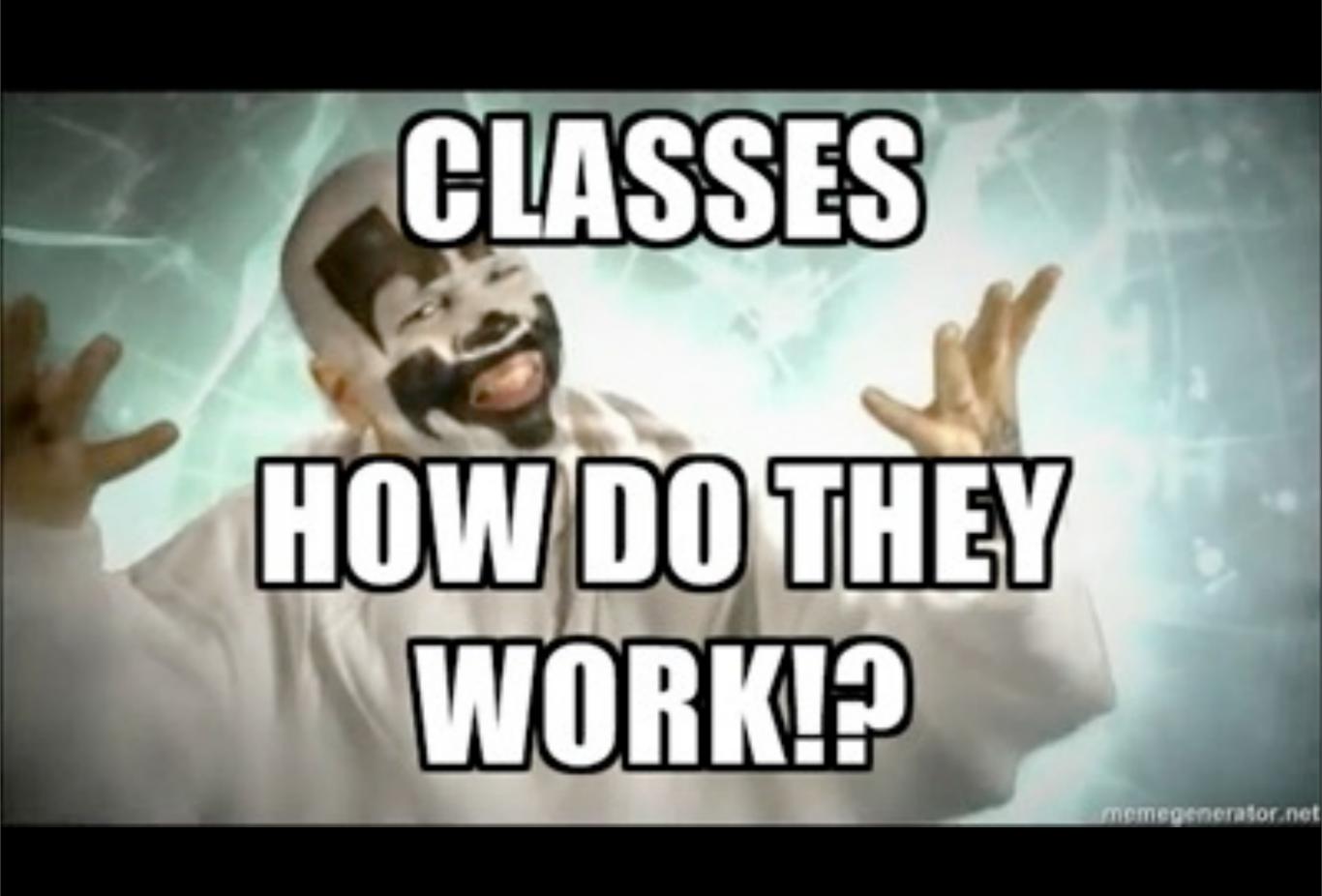
defaults:

title: 'Untitled'

# Doing Inheritance via a JavaScript Library

# Doing Inheritance via a JavaScript Library

```
var Document = Backbone.Model.extend({
   defaults: {
      title: 'Untitled'
   }
});
```



class Document extends Backbone.Model
 defaults:

title: 'Untitled'

Wednesday, April 11, 12

```
class Document extends Backbone.Model
  defaults:
    title: 'Untitled'

doc = new Document
```

```
class Document extends Backbone.Model
    defaults:
        title: 'Untitled'

doc = new Document

Document:: is Document.prototype
```

```
class Document extends Backbone.Model
  defaults:
     title: 'Untitled'

doc = new Document

Document:: is Document.prototype

doc.defaults is Document::defaults
```

```
class Document extends Backbone.Model
  defaults:
     title: 'Untitled'

doc = new Document

Document:: is Document.prototype

doc.defaults is Document::defaults

doc.validate is Backbone.Model::validate
```

```
class Document extends Backbone. Model
  defaults:
    title: 'Untitled'
doc = new Document
Document:: is Document.prototype
doc.defaults is Document::defaults
doc.validate is Backbone.Model::validate
doc.hasOwnProperty is Object::hasOwnProperty
```

# II. Superclass Methods Can Be Invoked With super

# II. Superclass Methods Can Be Invoked With super

```
class AppleDevice
  constructor: (cost) ->
   bankAccount.deduct cost
  bankAccount.deduct cost / 4 # AppleCare
```

# II. Superclass Methods Can Be Invoked With super

```
class AppleDevice
  constructor: (cost) ->
    bankAccount.deduct cost
  bankAccount.deduct cost / 4 # AppleCare

class iPhone extends AppleDevice
  constructor: (cost) ->
    super # equivalent to super(cost)
    setInterval (->
        bankAccount.deduct cost / 4
    ), ONE_MONTH
```

```
class Primate
  @thumbs = 'opposable'
```

```
class Primate
  @thumbs = 'opposable'
```

class Human extends Primate

```
class Primate
  @thumbs = 'opposable'

class Human extends Primate

Human.thumbs is Primate.thumbs is 'opposable'
```





#### Working with CoffeeScript

Step I: Install Node

Step I: Install Node

Step 2: npm install -g coffee-script

Step 1: Install Node

Step 2: npm install -g coffee-script

Want a different version? npm install -g coffee-script@1.2.0

Step 1: Install Node

Step 2: npm install -g coffee-script

Want a different version? npm install -g coffee-script@1.2.0

coffee -w

coffee -w

Rails / other web frameworks

coffee -w

Rails / other web frameworks

Middleman / other static web frameworks

coffee -w

Rails / other web frameworks

Middleman / other static web frameworks

LiveReload (Mac)

coffee -w

Rails / other web frameworks

Middleman / other static web frameworks

LiveReload (Mac)

Write a Cakefile

#### A Piece of Cake

source: <a href="https://github.com/sstephenson/node-coffee-project/">https://github.com/sstephenson/node-coffee-project/</a>

#### A Piece of Cake

source: <a href="https://github.com/sstephenson/node-coffee-project/">https://github.com/sstephenson/node-coffee-project/</a>

```
build = (watch, callback) ->
   if typeof watch is 'function'
    callback = watch
    watch = false
   options = ['-c', '-o', 'lib', 'src']
  options.unshift '-w' if watch
  coffee = spawn 'coffee', options
  coffee.stdout.on 'data', (data) -> print data.toString()
  coffee.stderr.on 'data', (data) -> print data.toString()
   coffee.on 'exit', (status) -> callback?() if status is 0
task 'build', 'Compile CoffeeScript source files', ->
  build()
task 'test', 'Run the test suite', ->
  build ->
    require.paths.unshift dirname + "/lib"
     {reporters} = require 'nodeunit'
    process.chdir dirname
    reporters.default.run ['test']
```

# YODAWG, DHEARD YOU DIKE COFFESCRIPT

SO I MADE YOU A CAKEFILE SO YOU CAN DO YOUR COFFEESCRIPT PROJECT BUILD SCRIPTS IN COFFEESCRIPT

#### Editing

#### **Text editor plugins**

New Page Edit Page Page History

- Brewer: rbrcurtis's Brewer project browser based editor uses the ace editor (which cloud9 also uses) to show the compiled JS alongside
  your coffeescript, much like the coffeescript homepage, and runs a simple nodejs webserver on your machine to provide file manipulation
  functionality.
- Cloud9IDE: tanepiper's Cloud9IDE CoffeeScript Live extension provides a live debug environment for .coffee files in Cloud9. Of course, written in CoffeeScript too!
- Coda/SubEthaEdit:
  - nfiniteset's CoffeeScript Coda/SubEthaEdit mode A syntax mode that provides syntax coloring.
  - parkerl's CoffeeScript.codaplugin Rough support for compiling and running in Coda's preview
- CodeMirror: coffeescript-codemirror-mode
- · Emacs:
  - defunkt's CoffeeScript Major Mode provides syntax highlighting, indentation support, and some bonus commands.
  - coffeelintnode provides on-the-fly coffeelint-ing of a coffee-script buffer using node.js, coffeelint and flymake-mode.
- gedit: wavded's gedit-coffeescript provides syntax highlighting.
- IntelliJ IDEA/RubyMine/PyCharm/PHPStorm/WebStorm:
  - yeungda's coffeescript-idea provides syntax highlighting, development halted; see next item.
  - netzpirat's CoffeeBrew an extensive refactoring and improvement upon coffeescript-idea. development halted: see next item.
  - Official Support is planned for RubyMine 4, using CoffeeBrew as a base. Whether or not this support will be more widely available is currently up in the air. Please add your comments to the bug tracker if you would like to see CoffeeScript support in other jetbrains products than just RubyMine, with all of the features one would expect from a jetbrains product (completion, inspections/intentions, auto-fix, go-to-definition, etc).

#### https://github.com/jashkenas/coffee-script/wiki/Text-editor-plugins

#### Documenting

#### source: <a href="http://coffeescript.org/documentation/docs/grammar.html">http://coffeescript.org/documentation/docs/grammar.html</a>

Our handy DSL for Jison grammar generation, thanks to <u>Tim Caswell</u>. For every rule in the grammar, we pass the pattern-defining string, the action to run, and extra options, optionally. If no action is specified, we simply pass the value of the previous nonterminal.

#### **Grammatical Rules**

In all of the rules that follow, you'll see the name of the nonterminal as the key to a list of alternative matches. With each match's action, the dollar-sign variables are provided by Jison as references to the value of their numeric position, so in this rule:

"Expression UNLESS Expression"

\$1 would be the value of the first Expression, \$2 would be the token for the UNLESS terminal, and \$3 would be the value of the second Expression.

The **Root** is the top-level node in the syntax tree. Since we parse bottom-up, all parsing must end here.

Any list of statements and expressions, separated by line breaks or semicolons.

```
o = (patternString, action, options) ->
 patternString = patternString.replace /\s{2,}/g, ' '
 return [patternString, '$$ = $1;', options] unless action
 action = if match = unwrap.exec action then match[1] else "(#{action}())"
 action = action.replace /bnew /g, '$&yy.'
 action = action.replace /b(?:Block\.wrap|extend)\b/g, 'yy.$&'
  [patternString, "SS = #{action};", options]
grammar =
  Root: [
                                               -> new Block
   o 'Body'
   o 'Block TERMINATOR'
  Body: [
                                               -> Block.wrap [$1]
   o 'Line',
   o 'Body TERMINATOR Line',
                                               -> $1.push $3
   o 'Body TERMINATOR'
```

## Testing

## Testing

Mocha

## Testing

Mocha

Mocha

## Testing

Mocha

Mocha

Mocha

### Testing

Mocha

Mocha

Mocha

http://visionmedia.github.com/mocha/

IV
The Future of Web Apps...?

#### A New Area of Confusion...

#### How to dynamically update a Jade element from client-side CoffeeScript?



I'm trying to dynamically update a table of values using SocketStream. I have a Jade template defining the table:

#### app.jade:





```
table
  thead
  tr
    th key
    th value
  tbody
    - var jadeItems = [{key:'Test',value:'3.1415'}, {key:'Test2',value:'2.1878'}
    - each item in jadeItems
        tr
        td= item.key
        td= item.value
```

This works for the static data, and now I need to make it dynamic. I have client-side CoffeeScript that receives a SocketStream message containing the new values for the table in JSON format:

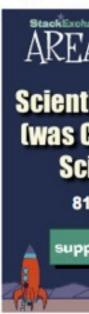
#### app.coffee:

```
SS.events.on('message', (message) ->
  jadeItems = JSON.parse(message)
)
```

I am trying to figure out how to replace the JSON value of items in Jade with with the content of the message, but the 'jadeltems' variable is out of scope in the client-side CoffeeScript.

http://stackoverflow.com/questions/7996883/





### Where is Your Code?

Does anyone know the Jade syntax for getting the value of a Jade element? Or is there a way to assign to the items variable defined in Jade from within the client-side CoffeeScript? Are there any solid references for Jade syntax?

coffeescript publish-subscribe jade socketstream

link | edit | close | flag



To clarify: You're using Jade client-side? - Trevor Burnham Nov 3 at 14:59

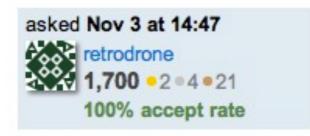
Ooh good question. Maybe not? It's created by SocketStream in the Views directory by default. I assume it's served to the client as is but maybe I'm wrong. I'm new to all this stuff but excited by what I see. Maybe I can update it from server-side CoffeeScript. — retrodrone Nov 3 at 15:01

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Does anyone know the Jade syntax for getting the value of a Jade element? Or is there a way to assign to the items variable defined in Jade from within the client-side CoffeeScript? Are there any solid references for Jade syntax?

coffeescript publish-subscribe jade socketstream link edit close flag



To clarify: You're using Jade client-side? - Trevor Burnham Nov 3 at 14:59

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http://stackoverflow.com/questions/7996883/

Stitch (37signals)

Stitch (37signals)

browserify

Stitch (37signals)

browserify

jsdom





### Thanks! Questions?

Follow me @trevorburnham and @coffeescript

Check out my new book, **Async JavaScript**<a href="http://leanpub.com/asyncjs">http://leanpub.com/asyncjs</a>