Testing JavaScript with Jasmine

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Agenda

- Briefly cover TDD
- Discuss what Jasmine is and isn't
- Show syntax with comparisons to RSpec
- Jasmine with:
    - Vanilla JavaScript
    - JavaScript through a rubygem
    - Jasmine with jQuery
    - Jasmine with Rails
    - Evergreen
- Where does CoffeeScript fit in?
- node.js, Maven, etc.
- Other helpful libraries

Why unit test JavaScript?

TDD?

"Red, Green, Refactor"

"There is only one way to go truly fast. Do the best job you can. Anything else is slower."

http://twitter.com/#!/unclebobmartin/status/39438225869254656

I DON'T ALWAYS TEST MY CODE
BUT WHEN I DO I DO IT IN PRODUCTION
memegenerator.net

Why Jasmine?

Jasmine is not an integration testing framework.

RSpec vs. Jasmine: Structure

```
#RSpec
describe "Calculate" do
    describe "#add" do
        it "should return 2" do
            ...
        end
    end
end

//Jasmine
describe "Calculate", function(){
    describe "#Add", function(){
        it "should return 2", function(){
        ...
        };
    });
});
```

RSpec vs. Jasmine: Before/After

```
#RSpec
before(:each) do
   @calc = Calculator.new
end

after(:each) do
   @calc.reset
end
```

```
//Jasmine
var calc;
beforeEach(function()
{     calc = new Calculator();
});

afterEach(function()
{     calc.reset();
});
```

RSpec vs. Jasmine: Expectations

```
# RSpec
it "should add the numbers" do
    calc = Calculator.new
    calc.add(1,1).should == 2
    calc.add(1,2).should_not == 2 #Use one expectation per 'it'!
end
```

```
// Jasmine
it("should add the numbers", function() {
    var calc = new Calculator();
    expect(calc.Add(1,1)).toEqual(2);
    expect(calc.Add(1,2)).not.toEqual(2); //Use one expectation per 'it'!
});
```

Jasmine Matchers

```
expect(x).toEqual(y)

expect(x).toBe(y);

expect(x).toMatch(pattern)

expect(x).toBeDefined()

expect(x).toBeNull();

expect(x).toBeTruthy();

expect(x).toBeFalsy();

expect(x).toContain(y);

expect(x).toBeLessThan(y);

expect(x).toBeGreaterThan(y);

expect(fn).toThrow(e);
```

RSpec vs. Jasmine: Stubbing

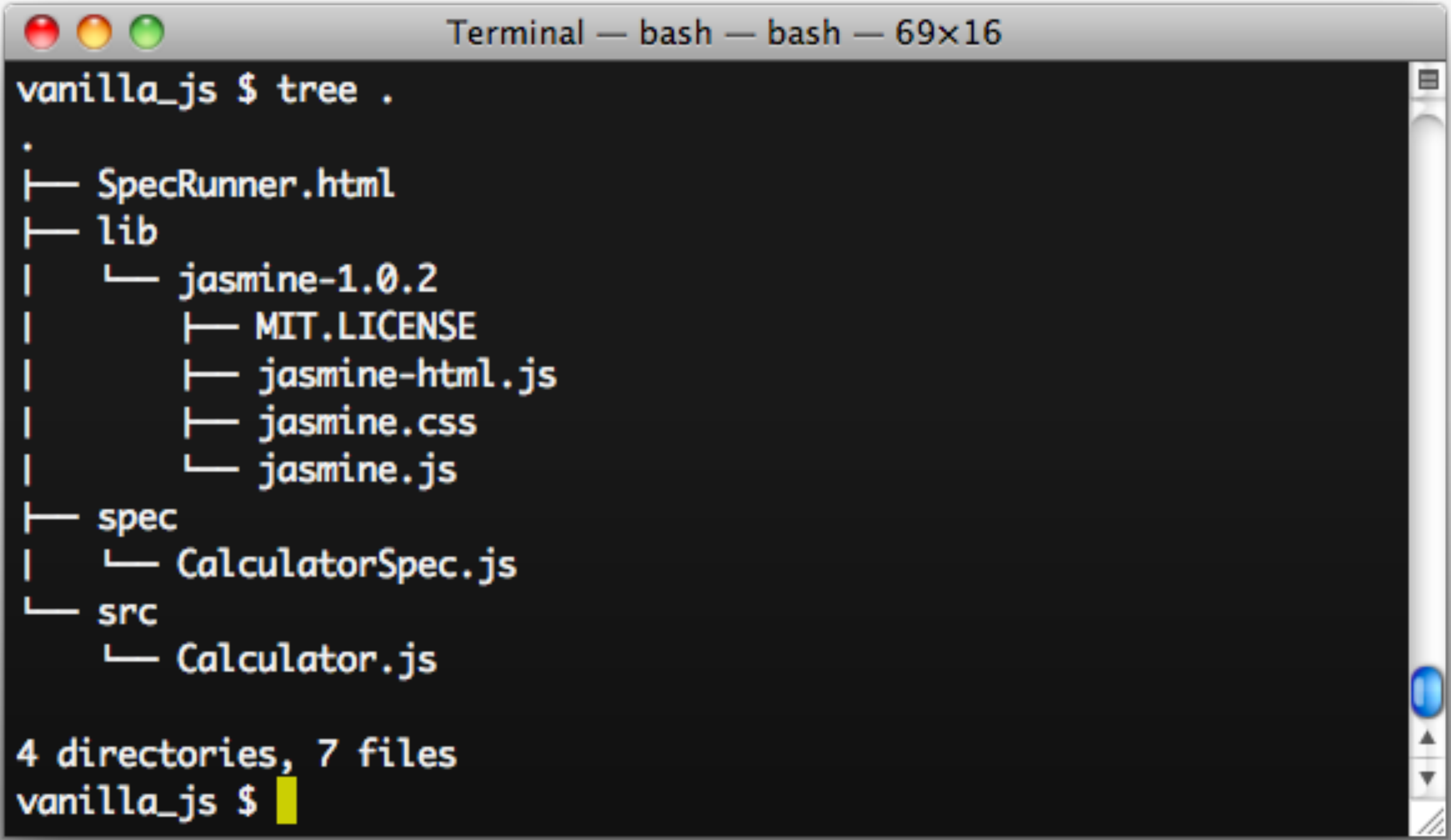
```
# RSpec
it "should add the numbers" do
    calc = Calculator.new
    calc.stub!(:add).and_return(3)
    calc.add(1,1).should == 3
end

// Jasmine
it("should add the numbers", function() {
    var calc = new Calculator();
    spyOn(calc, 'add').andReturn(3);
    expect(calc.Add(1,1)).toEqual(3);
});
```

Jasmine with "vanilla" JavaScript

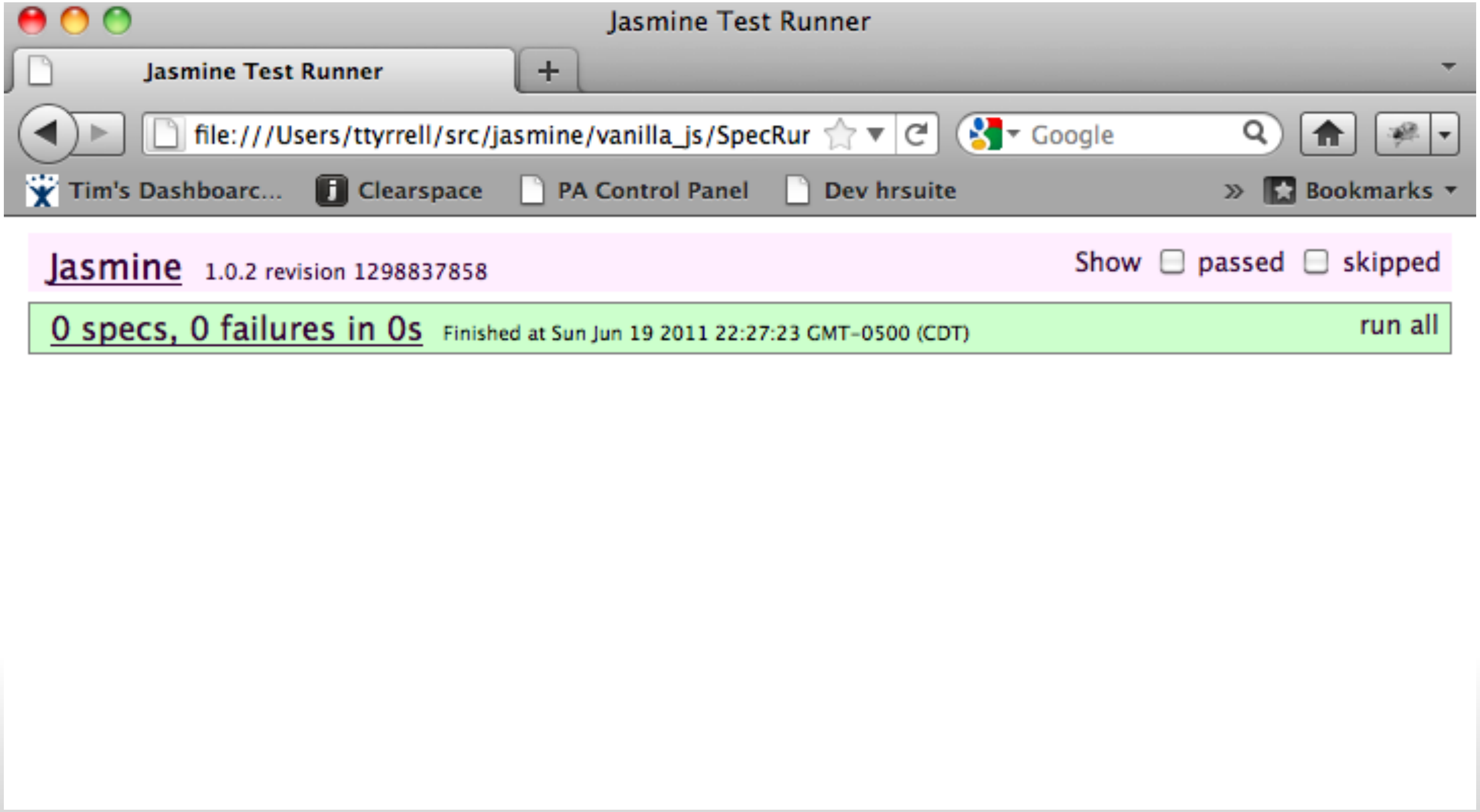
- Download "Stand alone"

http://pivotal.github.com/jasmine/download.html



```
vanilla_js $ tree .
.
├── SpecRunner.html
├── lib
|   └── jasmine-1.0.2
|       ├── MIT.LICENSE
|       ├── jasmine-html.js
|       ├── jasmine.css
|       └── jasmine.js
├── spec
|   └── CalculatorSpec.js
└── src
    └── Calculator.js

4 directories, 7 files
vanilla_js $
```



Jasmine 1.0.2 revision 1298837858

Show ☐ passed ☐ skipped

0 specs, 0 failures in 0s Finished at Sun Jun 19 2011 22:27:23 GMT-0500 (CDT)

run all

Spec for Calculator:

```
describe("Calculator", function() {
  var calc;

  beforeEach(function(){
    calc = new Calculator();
  });

  it("should add two numbers together", function() {
    expect(calc.Add(1,1)).toEqual(2);
  });
});
```

Spec for Calculator:

```
describe("Calculator", function() {
  var calc;

  beforeEach(function(){
    calc = new Calculator();
  });

  it("should add two numbers together", function() {
    expect(calc.Add(1,1)).toEqual(2);
  });
});
```

Spec for Calculator:

```
describe("Calculator", function() {
  var calc;

  beforeEach(function(){
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  });

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    expect(calc.Add(1,1)).toEqual(2);
  });
});
```

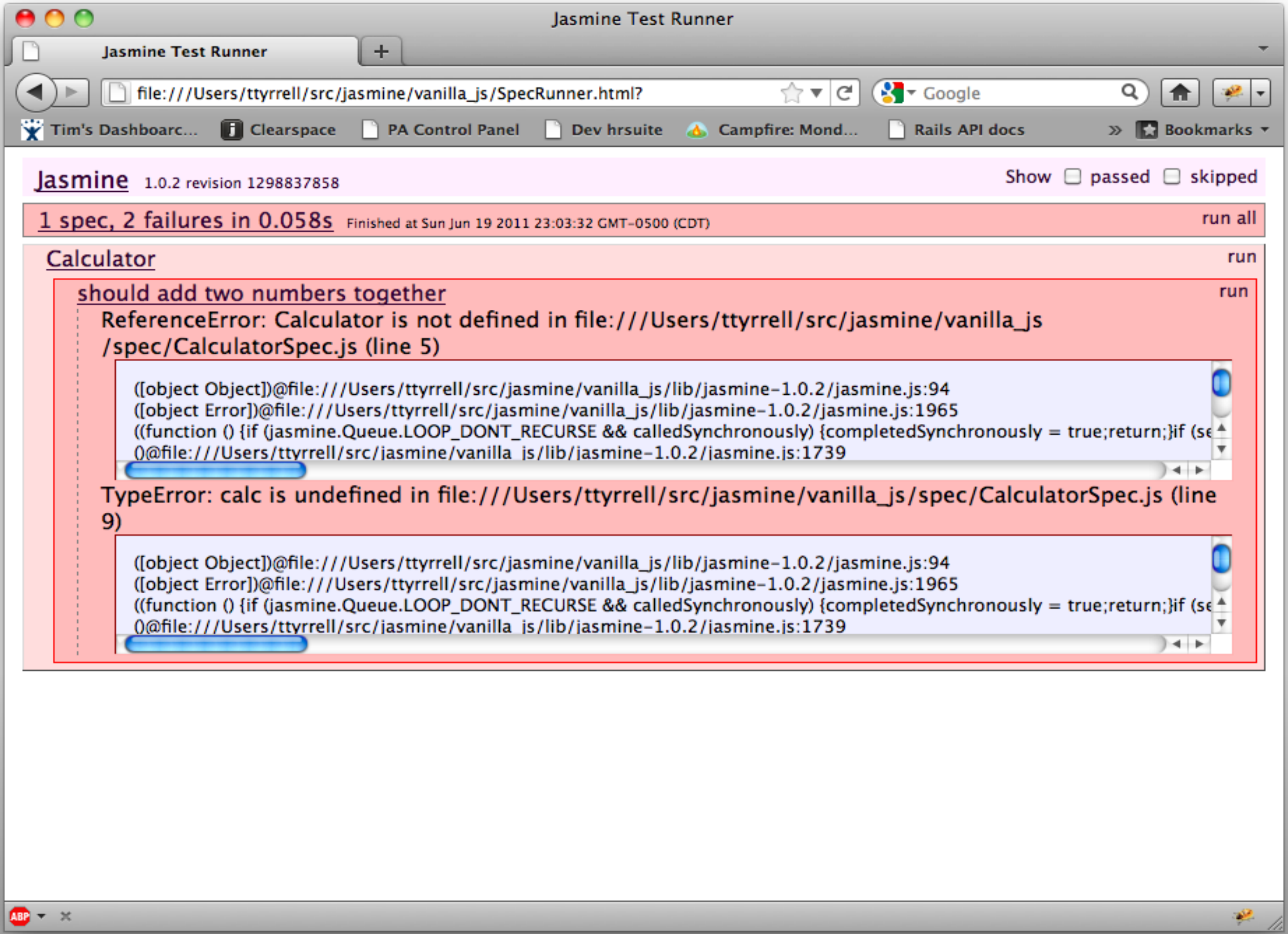
Spec for Calculator:

```
describe("Calculator", function() {
  var calc;

  beforeEach(function(){
    calc = new Calculator();
  });

  it("should add two numbers together", function() {
    expect(calc.Add(1,1)).toEqual(2);
  });
});
```

Failing Test



Jasmine 1.0.2 revision 1298837858 Show passed skipped

1 spec, 2 failures in 0.058s Finished at Sun Jun 19 2011 23:03:32 GMT-0500 (CDT) run all

Calculator run

should add two numbers together run

ReferenceError: Calculator is not defined in file:///Users/ttyrrell/src/jasmine/vanilla_js/spec/CalculatorSpec.js (line 5)

```
([object Object])@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:94
([object Error])@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:1965
((function () {if (jasmine.Queue.LOOP_DONT_RECURSE && calledSynchronously) {completedSynchronously = true;return;}if (se
()@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:1739
```

TypeError: calc is undefined in file:///Users/ttyrrell/src/jasmine/vanilla_js/spec/CalculatorSpec.js (line 9)

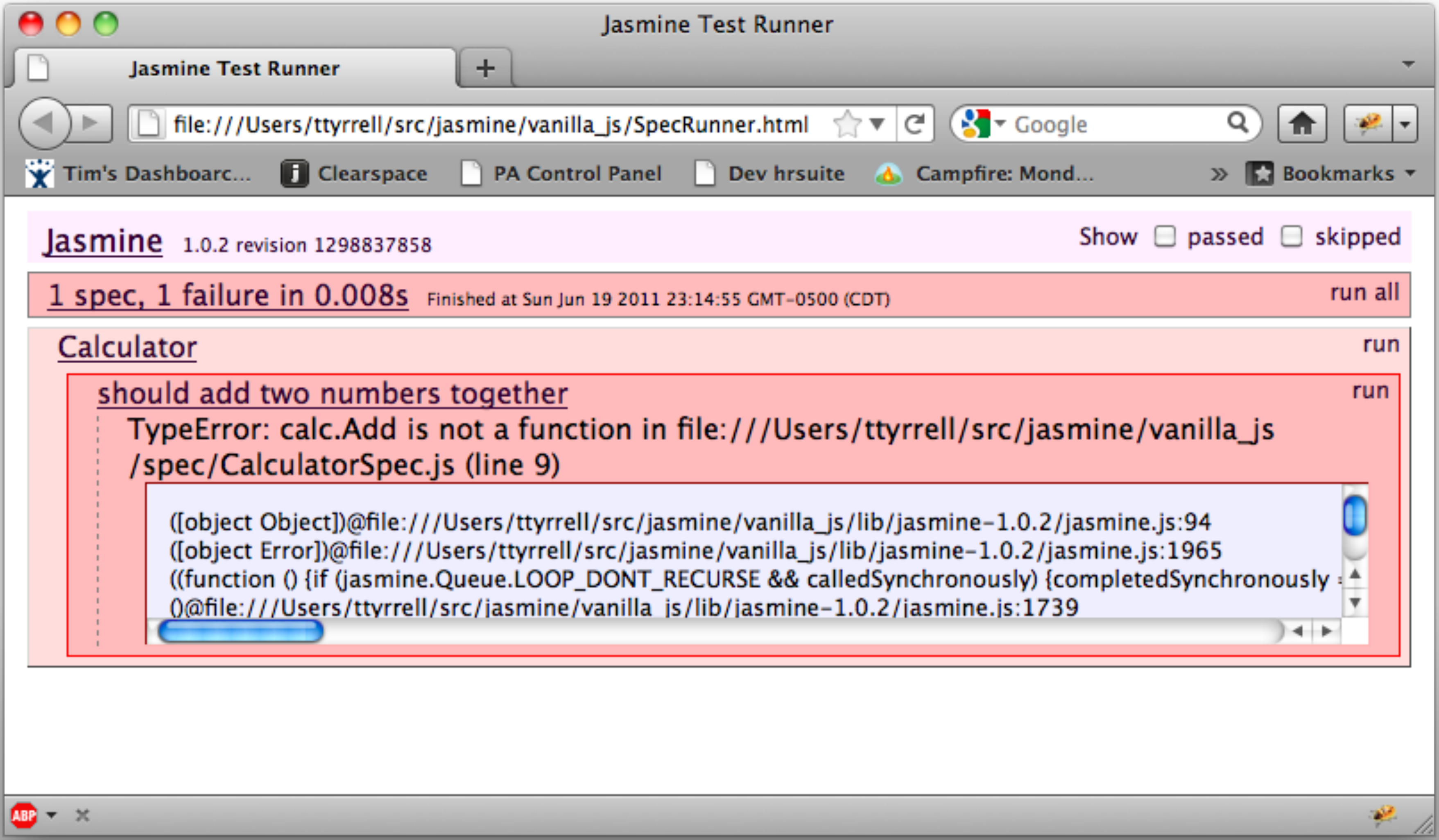
```
([object Object])@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:94
([object Error])@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:1965
((function () {if (jasmine.Queue.LOOP_DONT_RECURSE && calledSynchronously) {completedSynchronously = true;return;}if (se
()@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:1739
```

Stub out the "Calculator" function

```
function Calculator () {

}
```

One passing, one left to fix



Jasmine 1.0.2 revision 1298837858 Show ☐ passed ☐ skipped

1 spec, 1 failure in 0.008s Finished at Sun Jun 19 2011 23:14:55 GMT-0500 (CDT) run all

Calculator run

should add two numbers together run

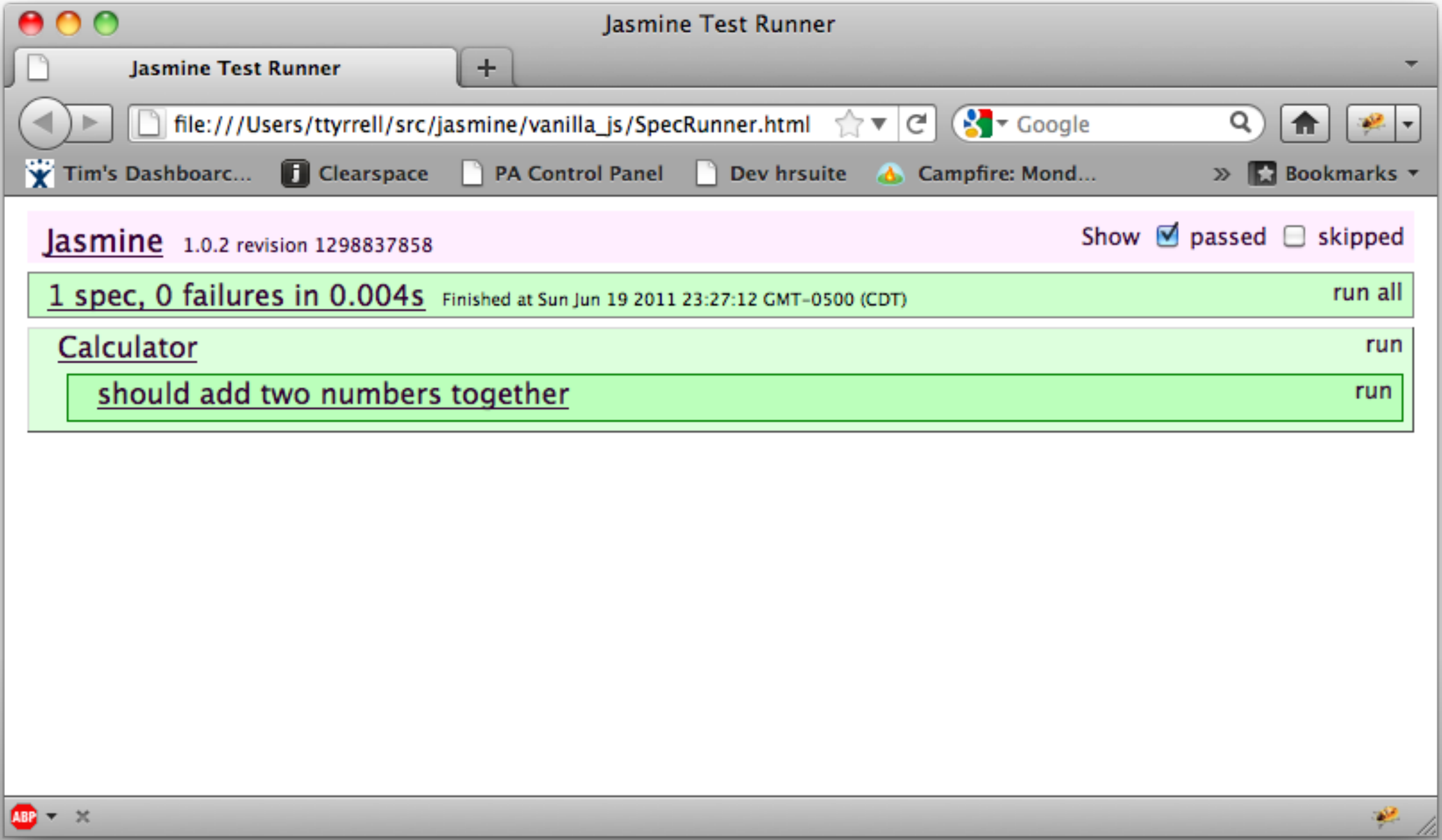
TypeError: calc.Add is not a function in file:///Users/ttyrrell/src/jasmine/vanilla_js/spec/CalculatorSpec.js (line 9)

```
([object Object])@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:94
([object Error])@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:1965
((function () {if (jasmine.Queue.LOOP_DONT_RECURSE && calledSynchronously) {completedSynchronously
()@file:///Users/ttyrrell/src/jasmine/vanilla_js/lib/jasmine-1.0.2/jasmine.js:1739
```

Add the method

```
function Calculator () {
  this.Add = function(num1, num2){
    return num1 + num1;
  };
}
```

Passed!



Jasmine 1.0.2 revision 1298837858 Show [✓ passed] skipped

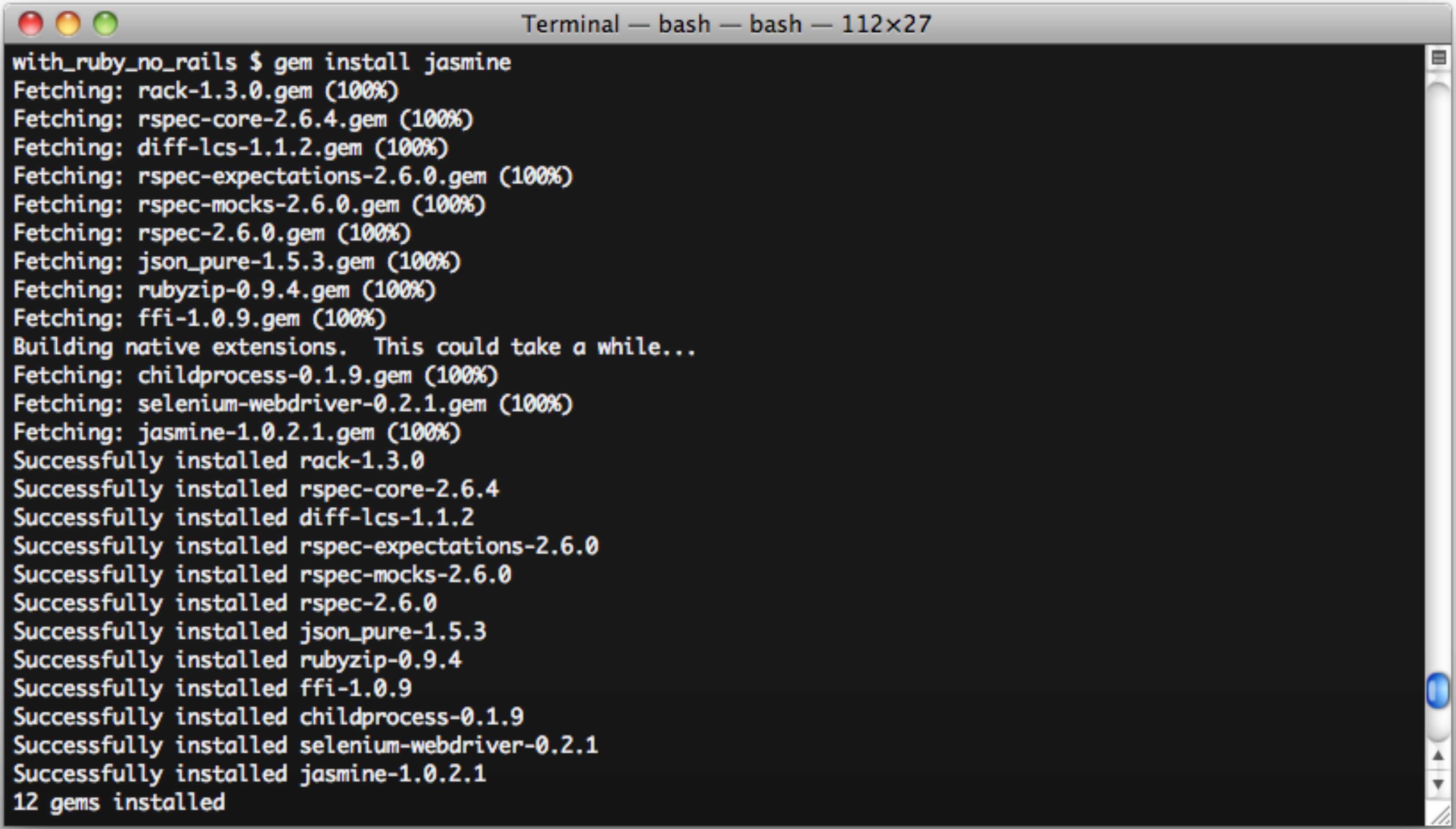
1 spec, 0 failures in 0.004s Finished at Sun Jun 19 2011 23:27:12 GMT-0500 (CDT) run all

Calculator run

should add two numbers together run

Jasmine with Ruby(no Rails)

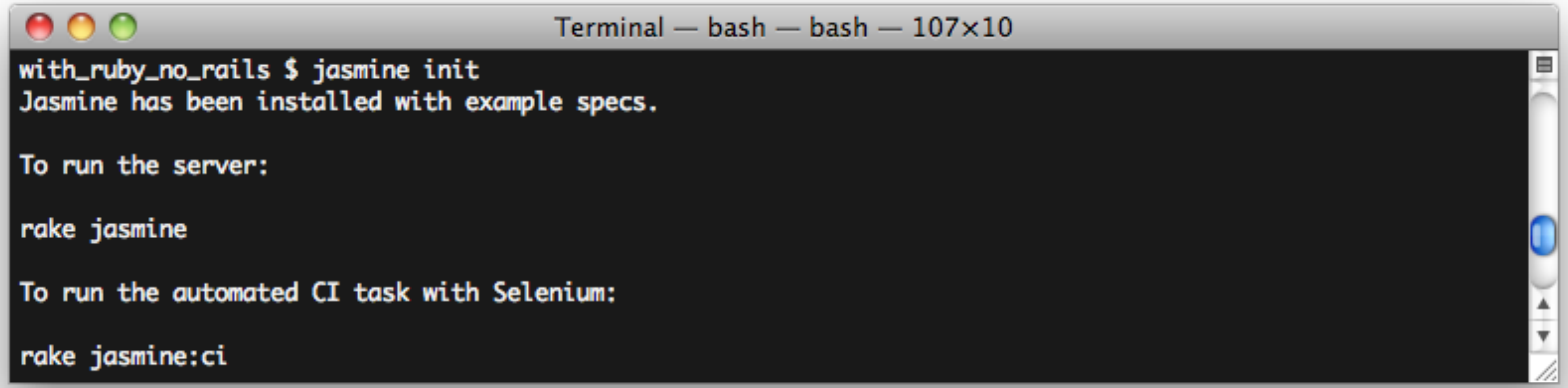
$ gem install jasmine



Terminal — bash — bash — 112×27

```
with_ruby_no_rails $ gem install jasmine
Fetching: rack-1.3.0.gem (100%)
Fetching: rspec-core-2.6.4.gem (100%)
Fetching: diff-lcs-1.1.2.gem (100%)
Fetching: rspec-expectations-2.6.0.gem (100%)
Fetching: rspec-mocks-2.6.0.gem (100%)
Fetching: rspec-2.6.0.gem (100%)
Fetching: json_pure-1.5.3.gem (100%)
Fetching: rubyzip-0.9.4.gem (100%)
Fetching: ffi-1.0.9.gem (100%)
Building native extensions.  This could take a while...
Fetching: childprocess-0.1.9.gem (100%)
Fetching: selenium-webdriver-0.2.1.gem (100%)
Fetching: jasmine-1.0.2.1.gem (100%)
Successfully installed rack-1.3.0
Successfully installed rspec-core-2.6.4
Successfully installed diff-lcs-1.1.2
Successfully installed rspec-expectations-2.6.0
Successfully installed rspec-mocks-2.6.0
Successfully installed rspec-2.6.0
Successfully installed json_pure-1.5.3
Successfully installed rubyzip-0.9.4
Successfully installed ffi-1.0.9
Successfully installed childprocess-0.1.9
Successfully installed selenium-webdriver-0.2.1
Successfully installed jasmine-1.0.2.1
12 gems installed
```

$ jasmine init


Terminal — bash — bash — 107×10

```
with_ruby_no_rails $ jasmine init
Jasmine has been installed with example specs.

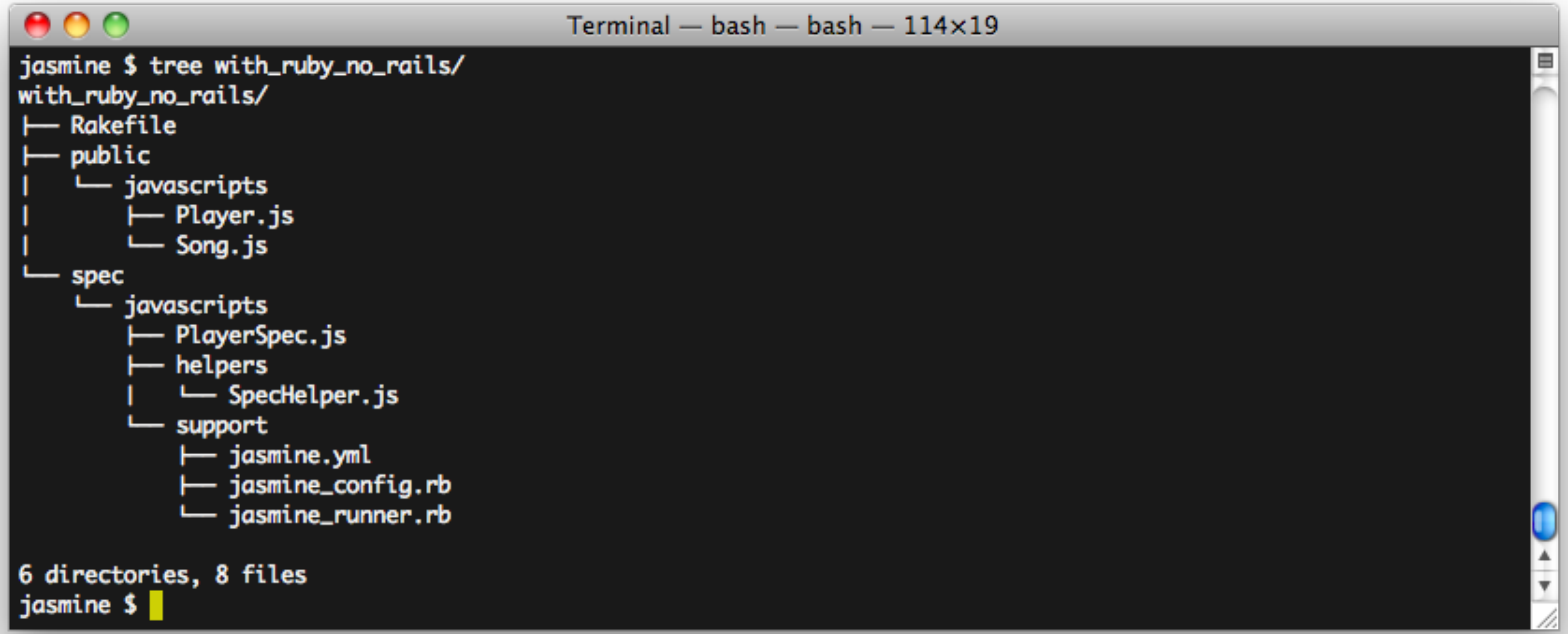
To run the server:

rake jasmine

To run the automated CI task with Selenium:

rake jasmine:ci
```

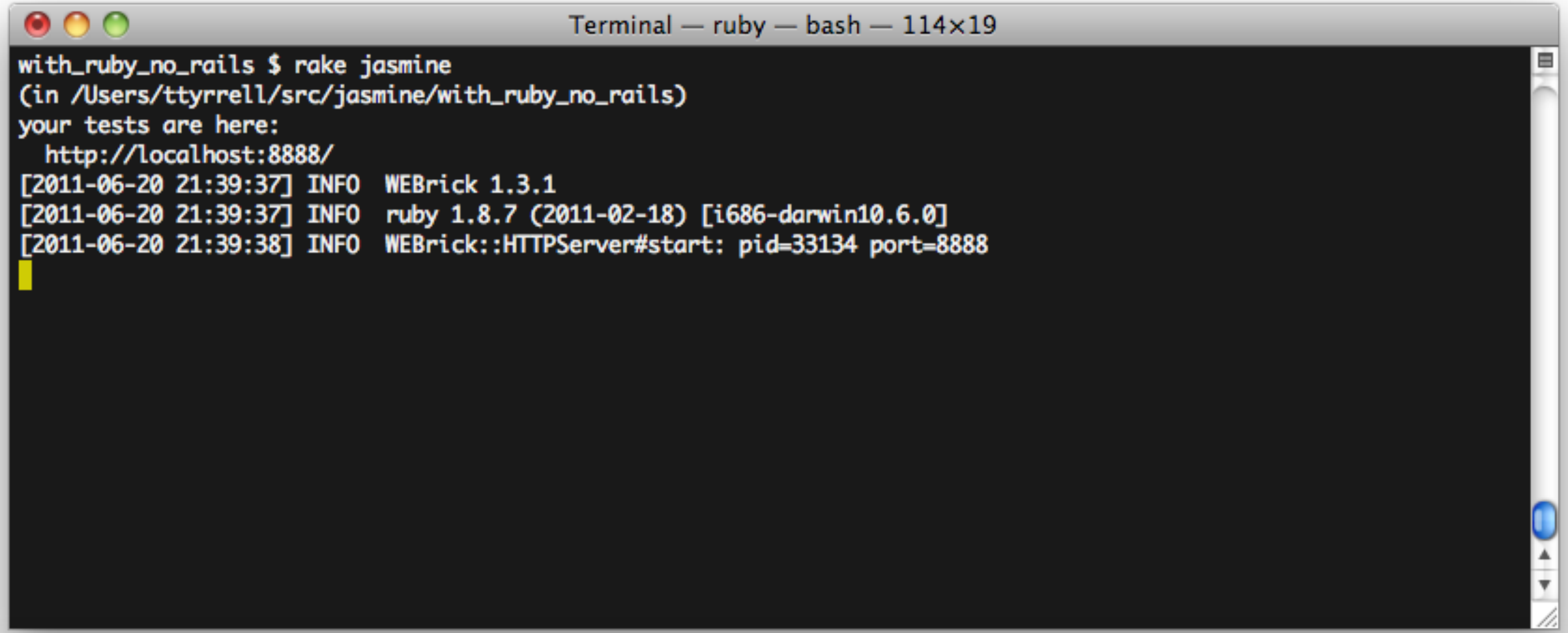
Generated folder structure


Terminal — bash — bash — 114×19

```
jasmine $ tree with_ruby_no_rails/
with_ruby_no_rails/
├── Rakefile
├── public
│   └── javascripts
│       ├── Player.js
│       └── Song.js
└── spec
    └── javascripts
        ├── PlayerSpec.js
        ├── helpers
        │   └── SpecHelper.js
        └── support
            ├── jasmine.yml
            ├── jasmine_config.rb
            └── jasmine_runner.rb

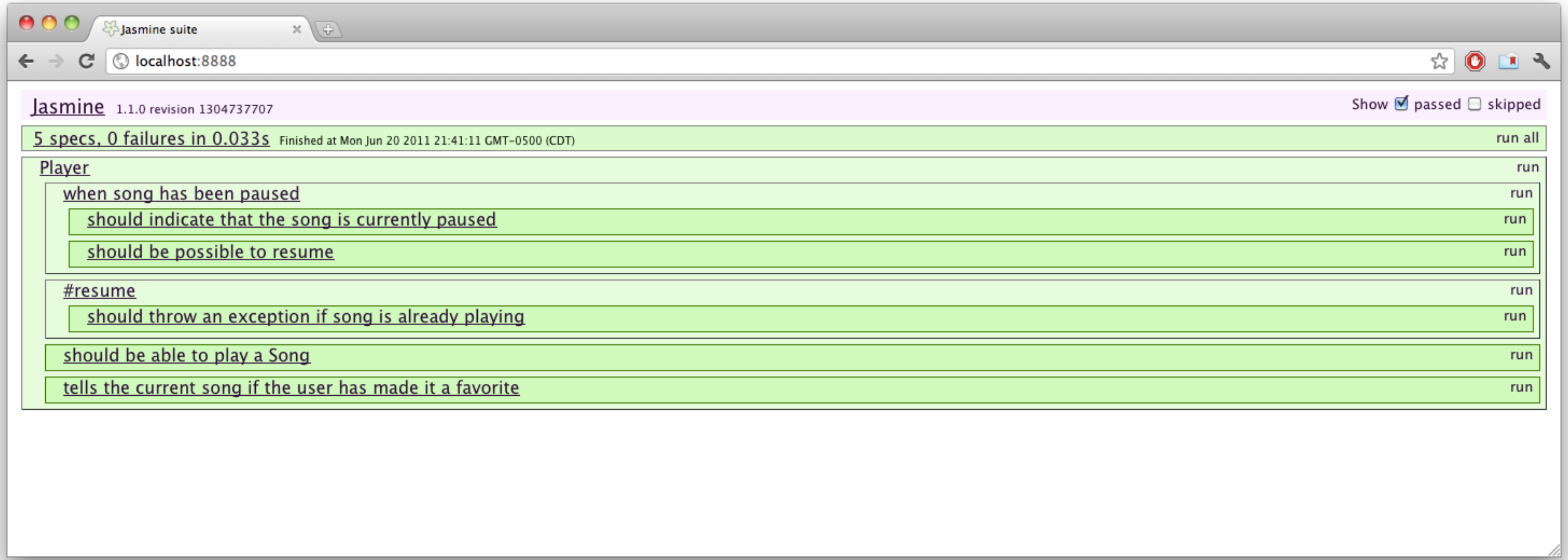
6 directories, 8 files
jasmine $
```

$ rake jasmine


Terminal — ruby — bash — 114×19

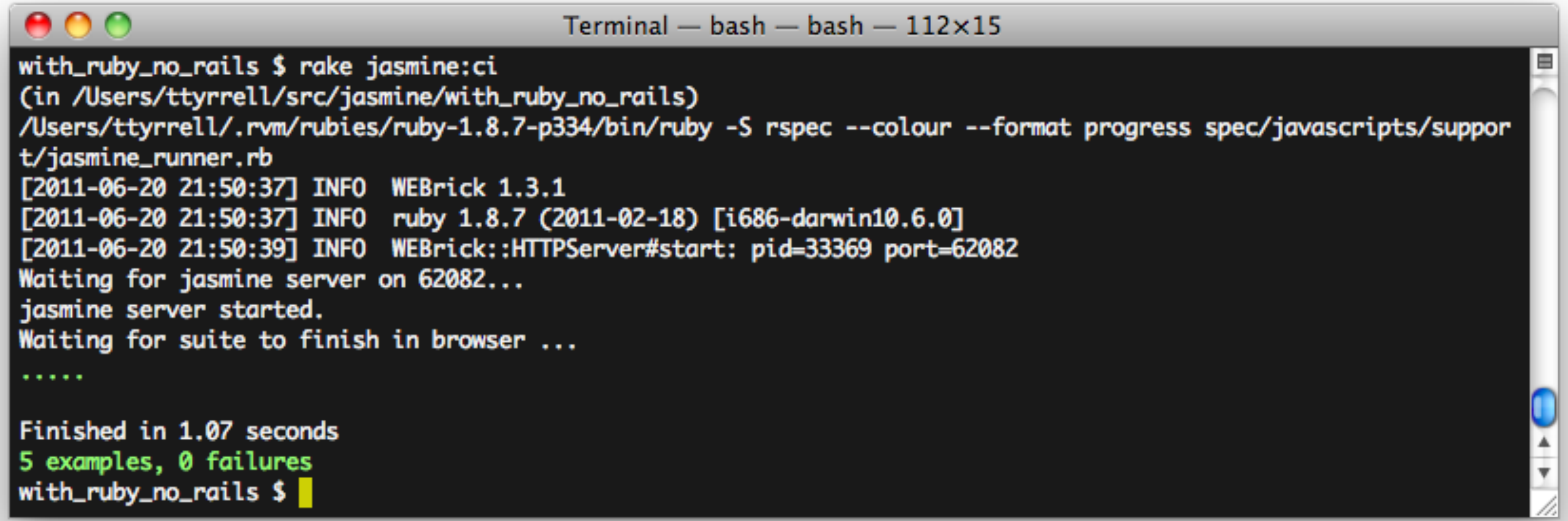
```
with_ruby_no_rails $ rake jasmine
(in /Users/ttyrrell/src/jasmine/with_ruby_no_rails)
your tests are here:
  http://localhost:8888/
[2011-06-20 21:39:37] INFO  WEBrick 1.3.1
[2011-06-20 21:39:37] INFO  ruby 1.8.7 (2011-02-18) [i686-darwin10.6.0]
[2011-06-20 21:39:38] INFO  WEBrick::HTTPServer#start: pid=33134 port=8888
```

http://localhost:8888



```
Jasmine 1.1.0 revision 1304737707                                   Show ☑ passed ☐ skipped
5 specs, 0 failures in 0.033s Finished at Mon Jun 20 2011 21:41:11 GMT-0500 (CDT)   run all
Player                                                                          run
  when song has been paused                                                     run
    should indicate that the song is currently paused                           run
    should be possible to resume                                                run
  #resume                                                                       run
    should throw an exception if song is already playing                        run
  should be able to play a Song                                                 run
  tells the current song if the user has made it a favorite                     run
```

$ rake jasmine:ci


Terminal — bash — bash — 112×15

```
with_ruby_no_rails $ rake jasmine:ci
(in /Users/ttyrrell/src/jasmine/with_ruby_no_rails)
/Users/ttyrrell/.rvm/rubies/ruby-1.8.7-p334/bin/ruby -S rspec --colour --format progress spec/javascripts/suppor
t/jasmine_runner.rb
[2011-06-20 21:50:37] INFO  WEBrick 1.3.1
[2011-06-20 21:50:37] INFO  ruby 1.8.7 (2011-02-18) [i686-darwin10.6.0]
[2011-06-20 21:50:39] INFO  WEBrick::HTTPServer#start: pid=33369 port=62082
Waiting for jasmine server on 62082...
jasmine server started.
Waiting for suite to finish in browser ...
.....

Finished in 1.07 seconds
5 examples, 0 failures
with_ruby_no_rails $ 
```

Jasmine with JQuery

jasmine-jquery Matchers

* toBe(jQuerySelector)
* toBeChecked()
* toBeEmpty()
* toBeHidden()
* toBeSelected()
* toBeVisible()
* toContain(jQuerySelector)
* toExist()
* toHaveAttr(attributeName, attributeValue)
* toHaveBeenTriggeredOn(selector)
* toHaveClass(className)
* toHaveData(key, value)
* toHaveHtml(string)
* toHaveId(id)
* toHaveText(string)
* toHaveValue(value)
* toBeDisabled()

LETTERING.JS

"A lightweight, easy to use Javascript <span> injector for radical Web Typography"

@davatron5000

Lettering.js

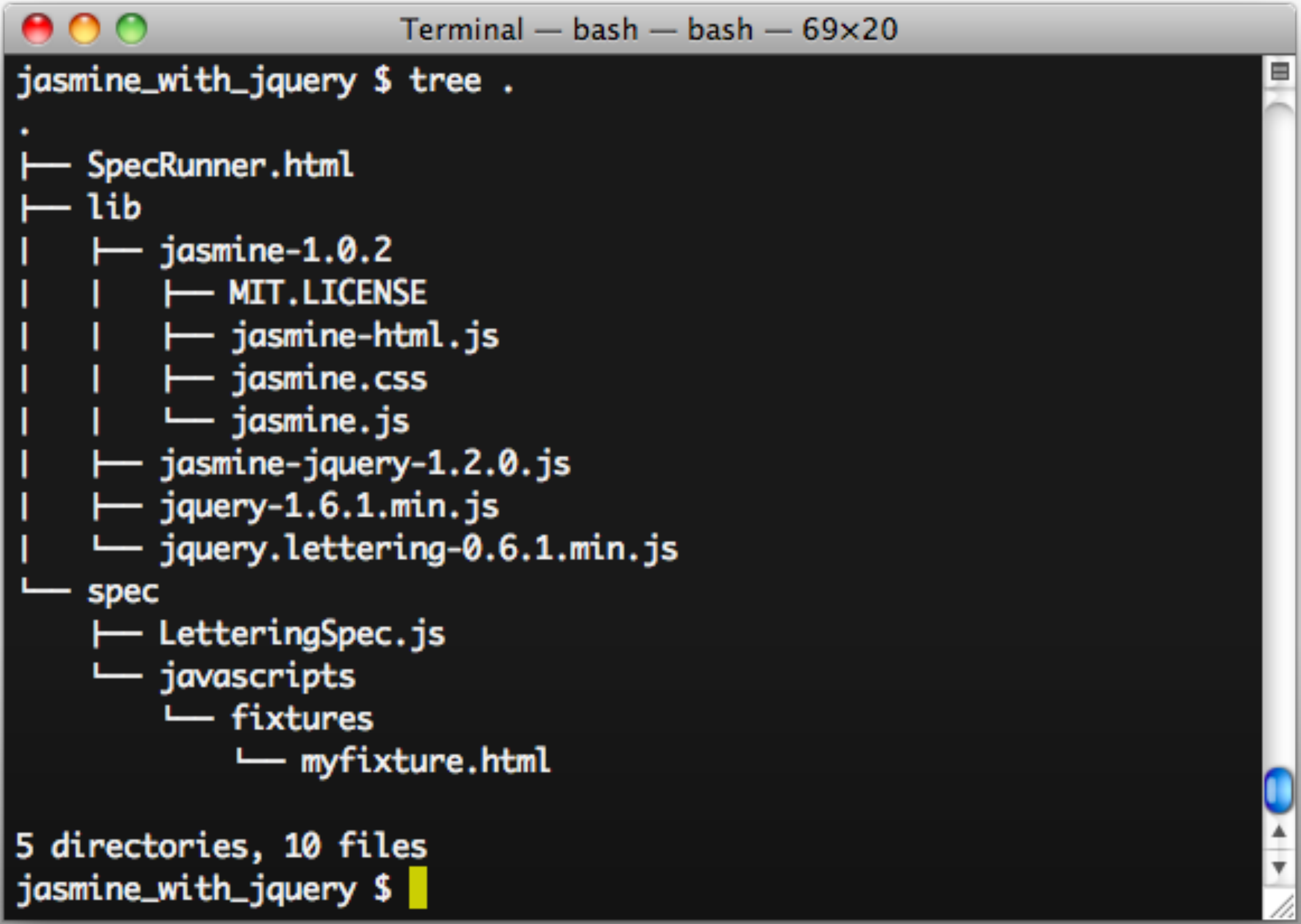
```
<h1 class="fancy_title">Some Title</h1>
```

```
<script>
  $(document).ready(function() {
    $(".fancy_title").lettering();
  });
</script>
```

Lettering.js results

```
<h1 class="fancy_title">
  <span class="char1">S</span>
  <span class="char2">o</span>
  <span class="char3">m</span>
  <span class="char4">e</span>
  <span class="char5"></span>
  <span class="char6">T</span>
  <span class="char7">i</span>
  <span class="char8">t</span>
  <span class="char9">l</span>
  <span class="char10">e</span>
</h1>
```

Standalone folder structure + more


Terminal — bash — bash — 69×20

```
jasmine_with_jquery $ tree .
.
├── SpecRunner.html
├── lib
|   ├── jasmine-1.0.2
|   |   ├── MIT.LICENSE
|   |   ├── jasmine-html.js
|   |   ├── jasmine.css
|   |   └── jasmine.js
|   ├── jasmine-jquery-1.2.0.js
|   ├── jquery-1.6.1.min.js
|   └── jquery.lettering-0.6.1.min.js
└── spec
    ├── LetteringSpec.js
    └── javascripts
        └── fixtures
            └── myfixture.html

5 directories, 10 files
jasmine_with_jquery $
```

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
  "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
  <title>Jasmine Test Runner</title>
  <link rel="stylesheet" type="text/css" href="lib/jasmine-1.0.2/jasmine.css">
  <script type="text/javascript" src="lib/jasmine-1.0.2/jasmine.js"></script>
  <script type="text/javascript" src="lib/jasmine-1.0.2/jasmine-html.js"></script>

  <script type="text/javascript" src="lib/jquery-1.6.1.min.js"></script>
  <script type="text/javascript" src="lib/jasmine-jquery-1.2.0.js"></script>
  <script type="text/javascript" src="lib/jquery.lettering-0.6.1.min.js"></script>

  <script type="text/javascript" src="spec/LetteringSpec.js"></script>

</head>
<body>

<script type="text/javascript">
  jasmine.getEnv().addReporter(new jasmine.TrivialReporter());
  jasmine.getEnv().execute();
</script>

</body>
</html>
```

```
describe("Lettering", function(){
  beforeEach(function(){
    //loadFixtures('myfixture.html');
    setFixtures('<h1 class="fancy_title">Some Title</h1>');
    $('.fancy_title').lettering();
  });

  it("should be visible", function() {
    expect($('.fancy_title')).toBeVisible();
  });

  it("should have 10 spans", function(){
    expect($('.fancy_title > span').length).toEqual(10);
  });

  it("should contain 'S' as the text of the first span", function(){
    expect($('.fancy_title > span:first').text()).toEqual('S');
  });

  it("should have a class of 'char1' on the first span", function(){
    expect($('.fancy_title > span:first')).toHaveClass('char1');
  });
});
```

```
describe("Lettering", function(){
  beforeEach(function(){
    //loadFixtures('myfixture.html');
    setFixtures('<h1 class="fancy_title">Some Title</h1>');
    $('.fancy_title').lettering();
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  });

  it("should have a class of 'char1' on the first span", function(){
    expect($('.fancy_title > span:first')).toHaveClass('char1');
  });
});
```

```
describe("Lettering", function(){
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    //loadFixtures('myfixture.html');
    setFixtures('<h1 class="fancy_title">Some Title</h1>');
    $('.fancy_title').lettering();
  });

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    expect($('.fancy_title > span:first').text()).toEqual('S');
  });

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    expect($('.fancy_title > span:first')).toHaveClass('char1');
  });
});
```

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  beforeEach(function(){
    //loadFixtures('myfixture.html');
    setFixtures('<h1 class="fancy_title">Some Title</h1>');
    $('.fancy_title').lettering();
  });

  it("should be visible", function() {
    expect($('.fancy_title')).toBeVisible();
  });

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  });
});
```

```
describe("Lettering", function(){
  beforeEach(function(){
    //loadFixtures('myfixture.html');
    setFixtures('<h1 class="fancy_title">Some Title</h1>');
    $('.fancy_title').lettering();
  });

  it("should be visible", function() {
    expect($('.fancy_title')).toBeVisible();
  });

  it("should have 10 spans", function(){
    expect($('.fancy_title > span').length).toEqual(10);
  });

  it("should contain 'S' as the text of the first span", function(){
    expect($('.fancy_title > span:first').text()).toEqual('S');
  });

  it("should have a class of 'char1' on the first span", function(){
    expect($('.fancy_title > span:first')).toHaveClass('char1');
  });
});
```

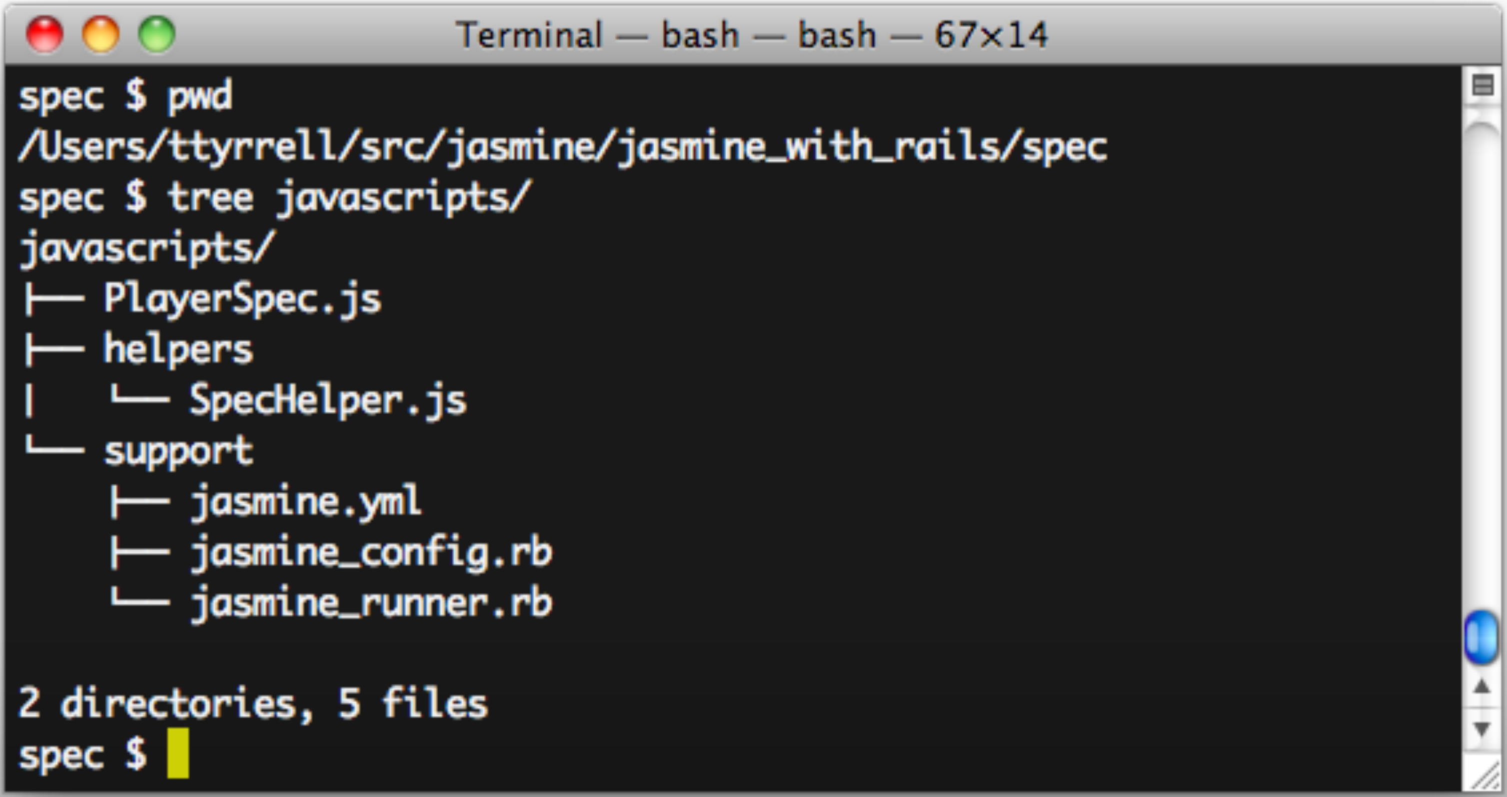
Jasmine with Rails

```
gem "jasmine"

$ bundle install
$ jasmine init (optional)
$ rake jasmine
or
$ rake jasmine:ci
```

http://localhost:8888

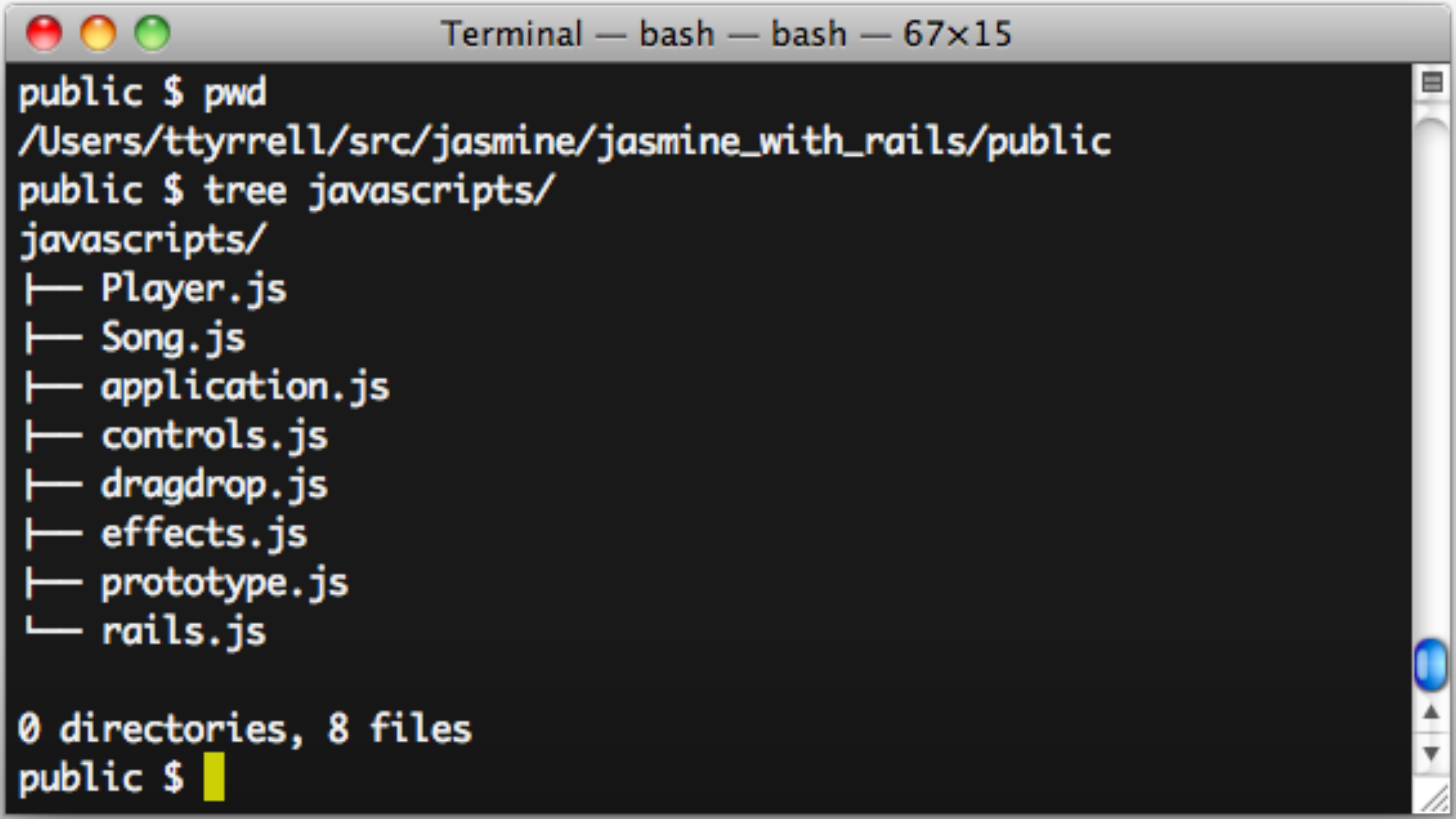
Generated Rails spec folder



```
spec $ pwd
/Users/ttyrrell/src/jasmine/jasmine_with_rails/spec
spec $ tree javascripts/
javascripts/
├── PlayerSpec.js
├── helpers
|   └── SpecHelper.js
└── support
    ├── jasmine.yml
    ├── jasmine_config.rb
    └── jasmine_runner.rb

2 directories, 5 files
spec $ 
```

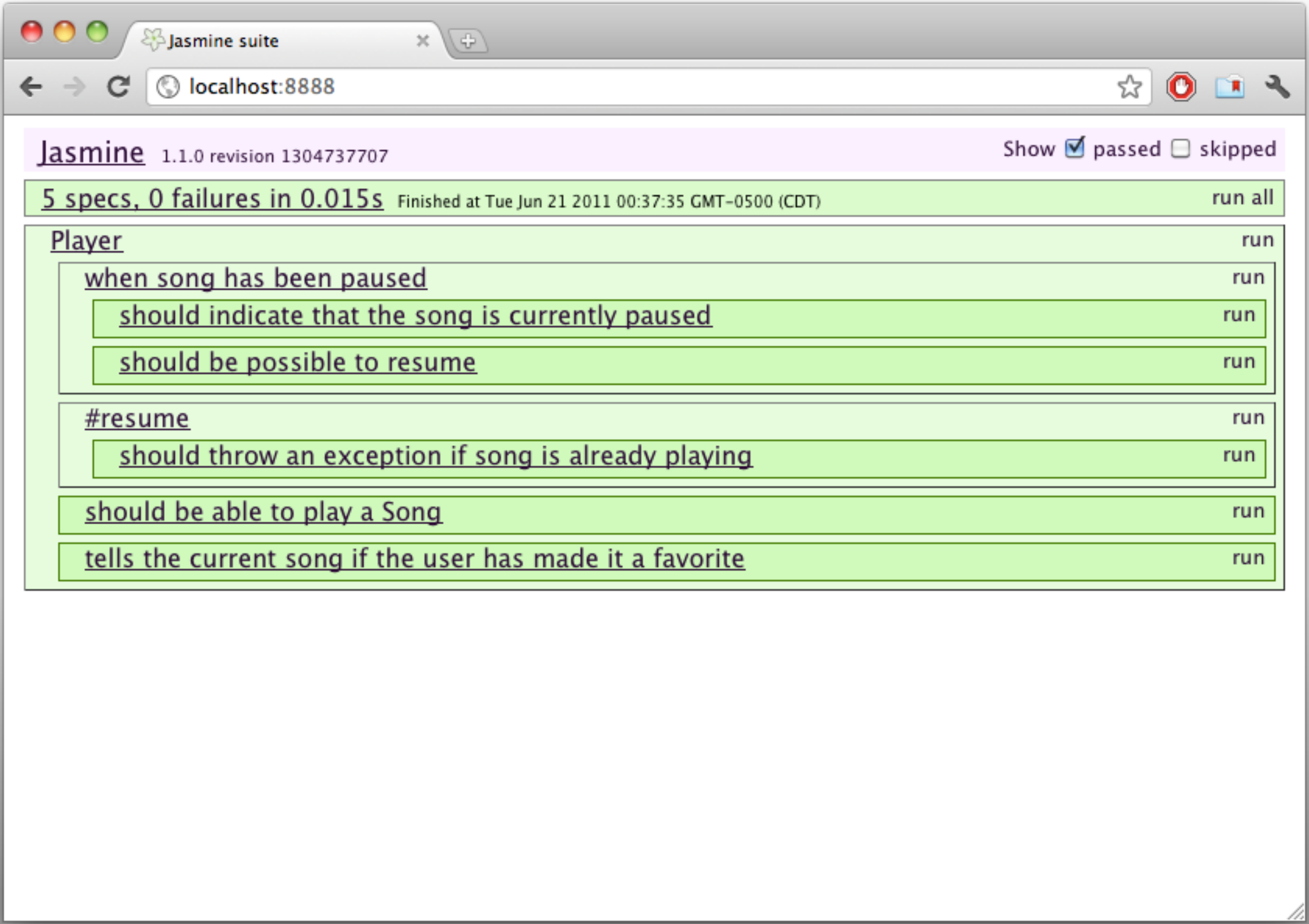
Generated default javascript objects



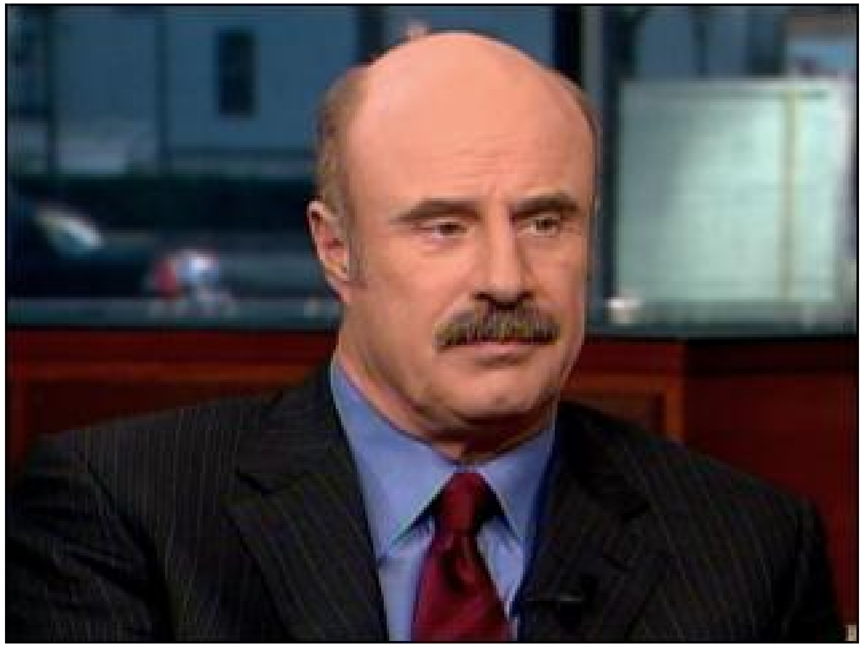
```
public $ pwd
/Users/ttyrrell/src/jasmine/jasmine_with_rails/public
public $ tree javascripts/
javascripts/
├── Player.js
├── Song.js
├── application.js
├── controls.js
├── dragdrop.js
├── effects.js
├── prototype.js
└── rails.js

0 directories, 8 files
public $
```

$ rake jasmine

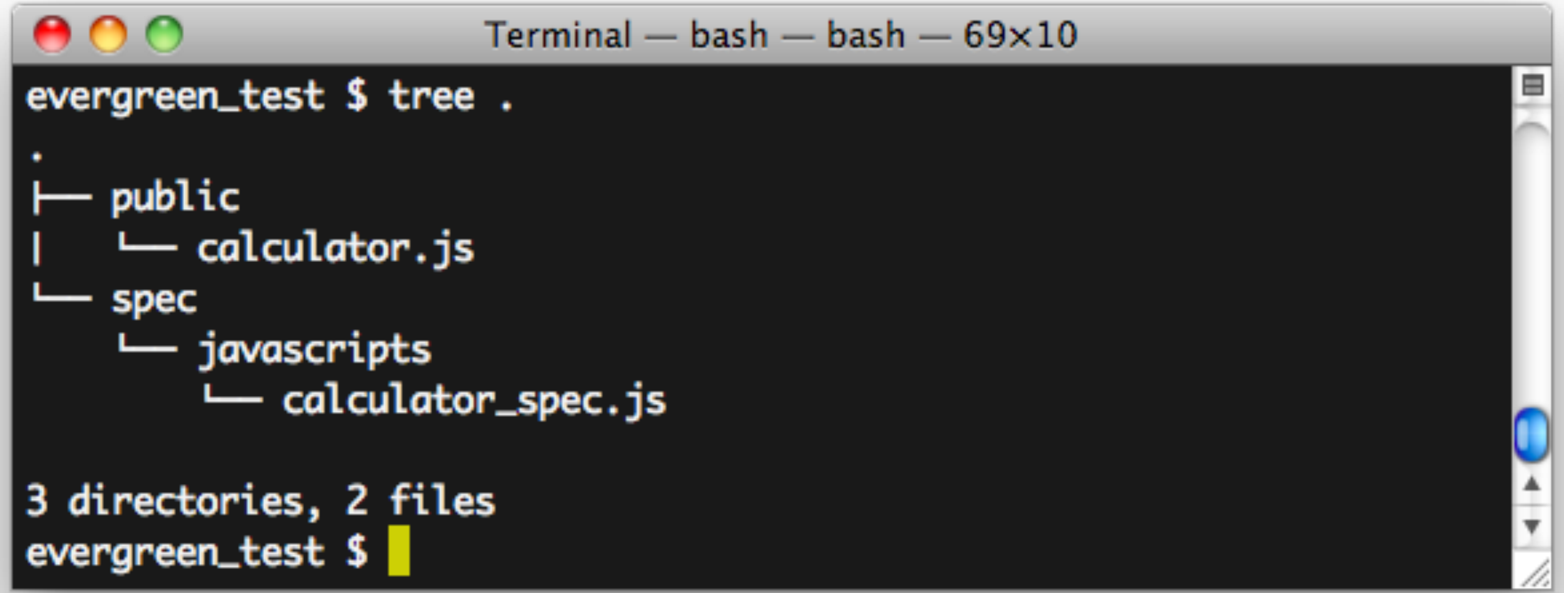


```
Jasmine 1.1.0 revision 1304737707                                   Show [✓ passed] skipped
5 specs, 0 failures in 0.015s Finished at Tue Jun 21 2011 00:37:35 GMT-0500 (CDT)      run all
Player                                                                                     run
  when song has been paused                                                                run
    should indicate that the song is currently paused                                      run
    should be possible to resume                                                           run
  #resume                                                                                  run
    should throw an exception if song is already playing                                   run
  should be able to play a Song                                                            run
  tells the current song if the user has made it a favorite                                run
```



$ gem install evergreen

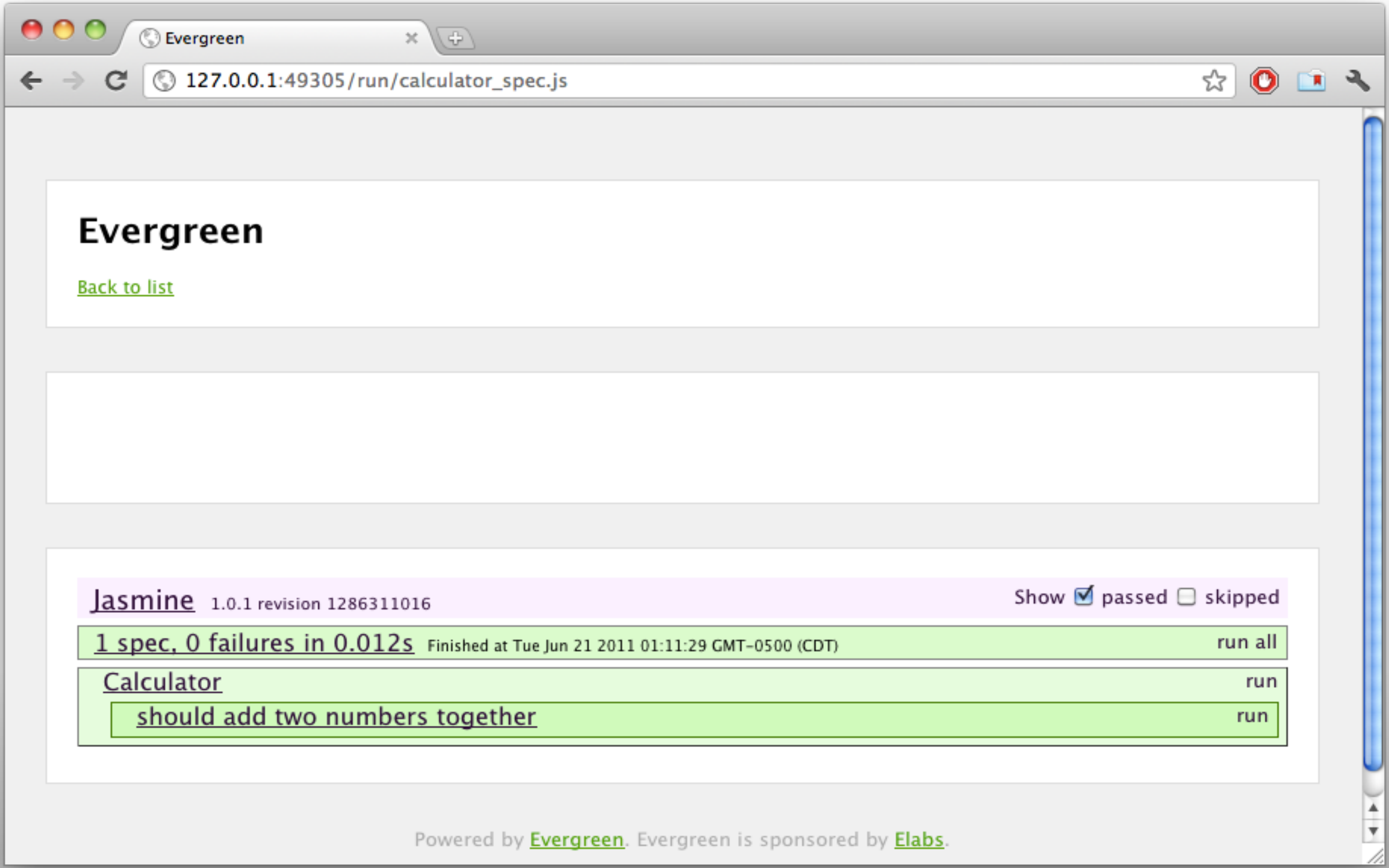
Evergreen default folder paths (not generated)



```
evergreen_test $ tree .
.
├── public
│   └── calculator.js
└── spec
    └── javascripts
        └── calculator_spec.js

3 directories, 2 files
evergreen_test $
```

$ evergreen serve



Evergreen

127.0.0.1:49305/run/calculator_spec.js

Evergreen

Back to list

Jasmine 1.0.1 revision 1286311016 Show ☑ passed ☐ skipped

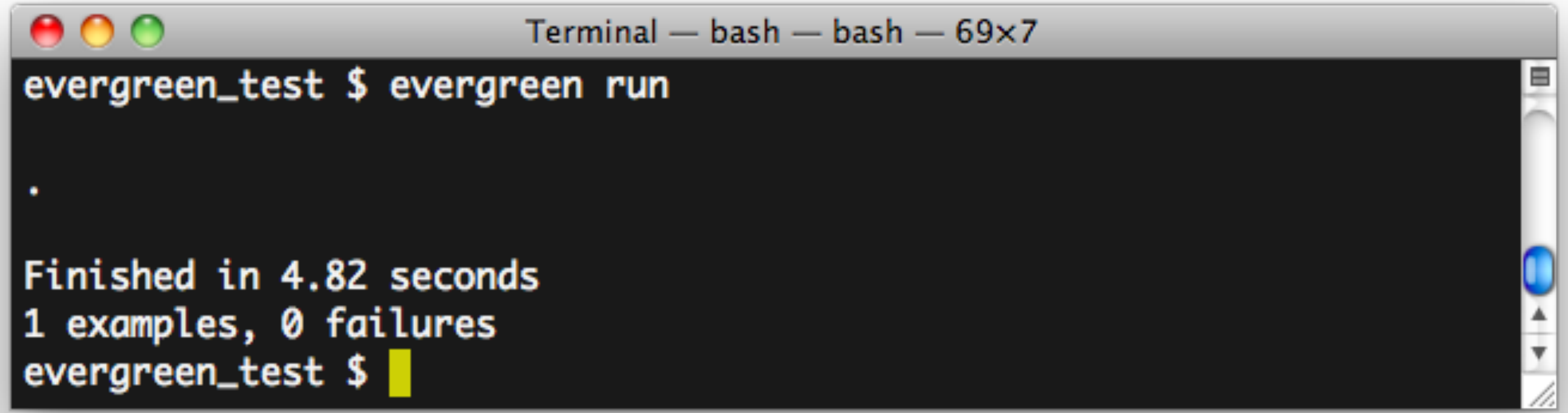
1 spec, 0 failures in 0.012s Finished at Tue Jun 21 2011 01:11:29 GMT-0500 (CDT) run all

Calculator run

should add two numbers together run

Powered by Evergreen. Evergreen is sponsored by Elabs.

$ evergreen run


Terminal — bash — bash — 69×7

```
evergreen_test $ evergreen run


.


Finished in 4.82 seconds
1 examples, 0 failures
evergreen_test $
```

Evergreen and Rails 3

gem 'evergreen', :require => 'evergreen/rails'localhost:3000/evergreenrake spec:javascripts

CoffeeScript???

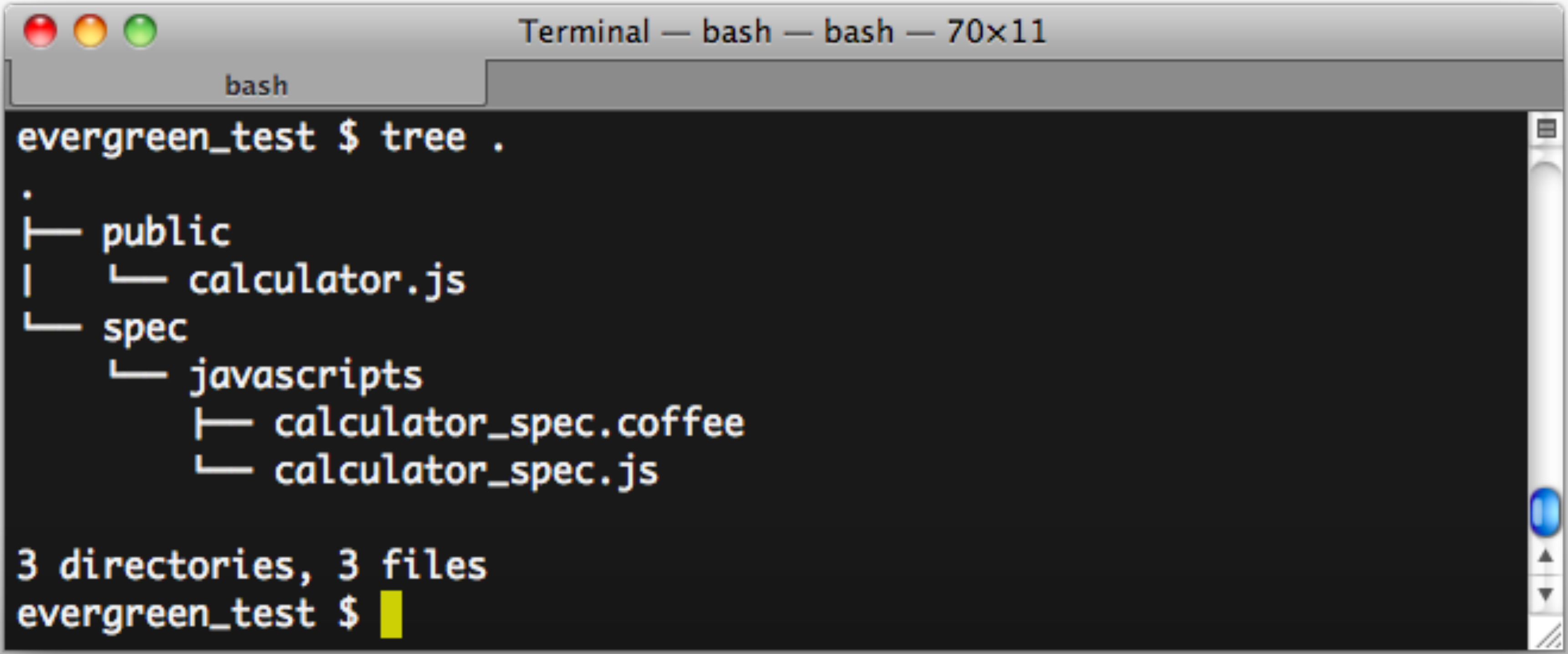
Installing CoffeeScript

```
brew install node.js (then add to PATH, NODE_PATH)

curl http://npmjs.org/install.sh | sh

npm install -g coffee-script
```

Add a "_spec.coffee" file



```
evergreen_test $ tree .
.
├── public
|   └── calculator.js
└── spec
    └── javascripts
        ├── calculator_spec.coffee
        └── calculator_spec.js

3 directories, 3 files
evergreen_test $ 
```

```
require('/calculator.js')

describe 'Calculator', ->
  beforeEach ->
    @calc = new Calculator
  it 'should add two numbers together', ->
    expect(@calc.Add(1,1)).toEqual(2)
```

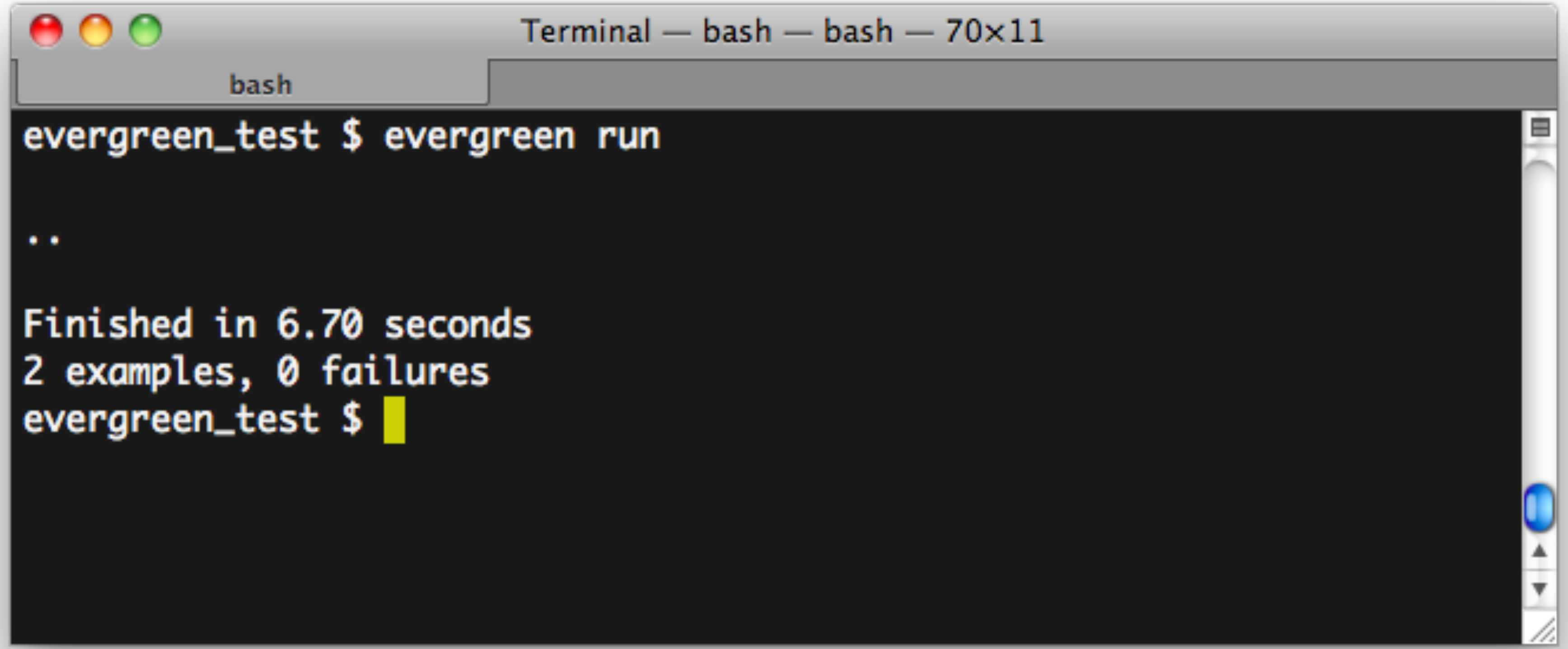
```
require('/calculator.js')

describe 'Calculator', ->
  beforeEach ->
    @calc = new Calculator
  it 'should add two numbers together', ->
    expect(@calc.Add(1,1)).toEqual(2)
```

```
require('/calculator.js')

describe 'Calculator', ->
  beforeEach ->
    @calc = new Calculator
  it 'should add two numbers together', ->
    expect(@calc.Add(1,1)).toEqual(2)
```

#winning



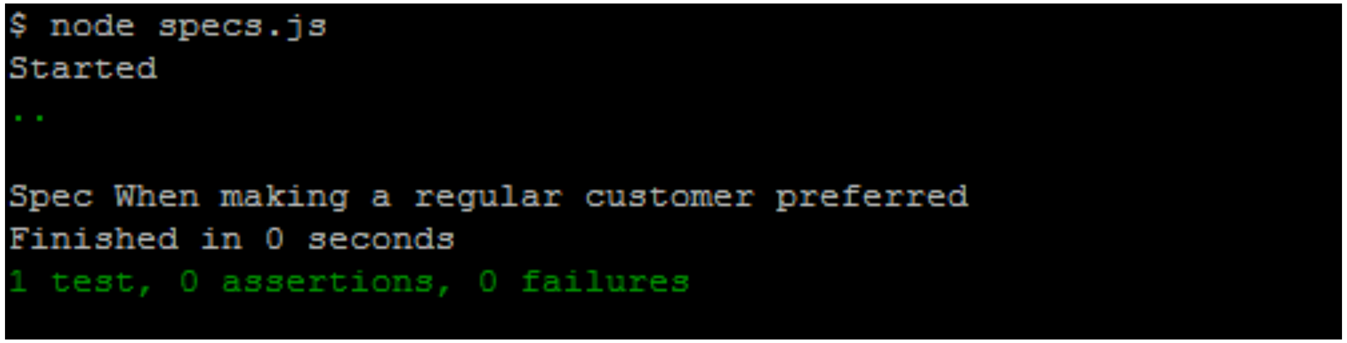
```
evergreen_test $ evergreen run


..

Finished in 6.70 seconds
2 examples, 0 failures
evergreen_test $ 
```

Node.js + Jasmine

"jasmine-node"



```
$ node specs.js
Started
..

Spec When making a regular customer preferred
Finished in 0 seconds
1 test, 0 assertions, 0 failures
```

Any other cool utilities?

Summer Breeze

"Summer Breeze is a tool for generating fixture DOM output for Jasmine JavaScript tests directly from your Rails Views with a simple DSL for specifying fixtures"

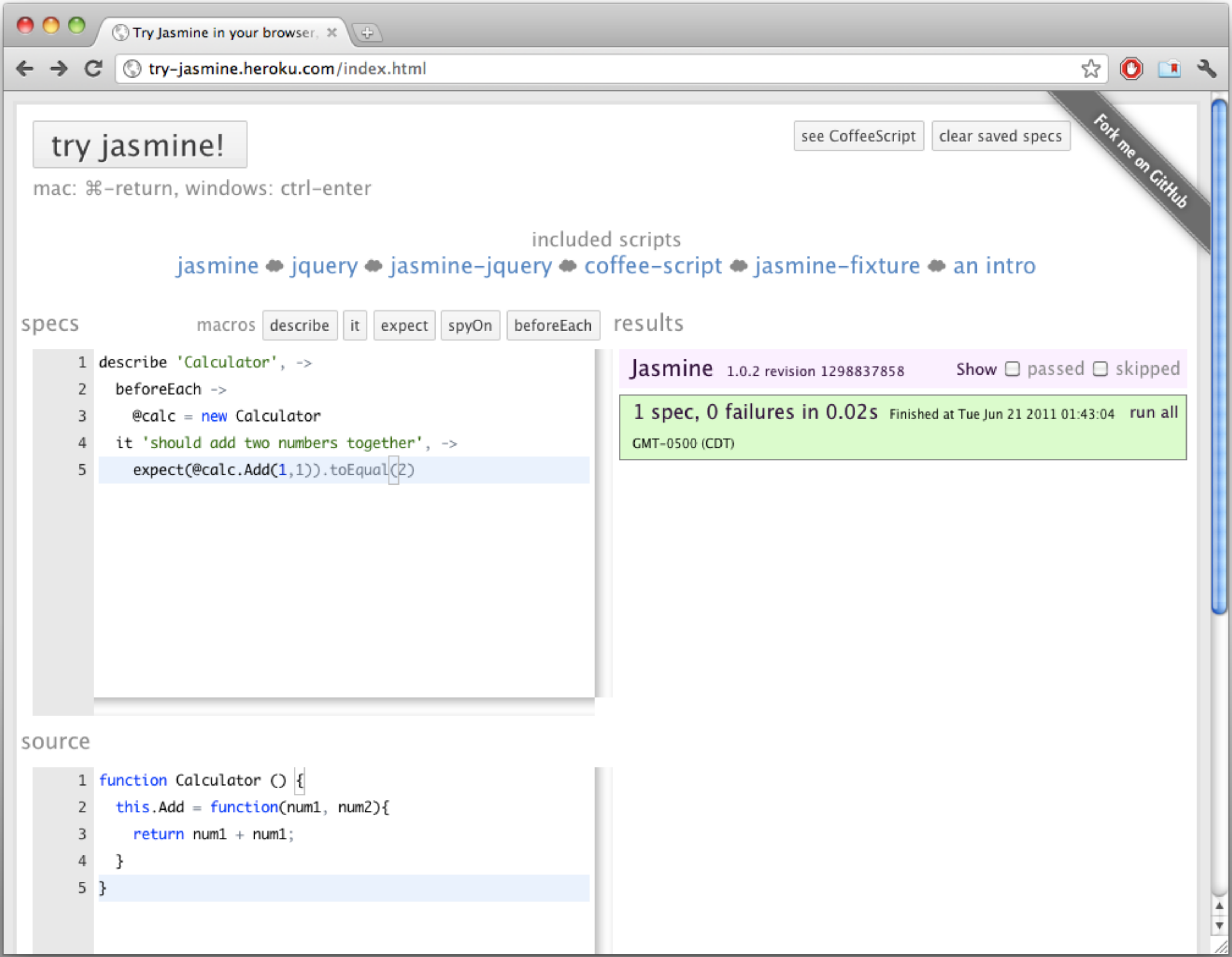
https://github.com/noelrappin/summer_breeze

Rosie

"Rosie is a factory for building JavaScript objects, mostly useful for setting up test data. It is inspired by factory_girl."

https://github.com/bkeepers/rosie

http://try-jasmine.heroku.com


Try Jasmine in your browser
try-jasmine.heroku.com/index.html
try jasmine!
see CoffeeScript
clear saved specs
Fork me on GitHub

mac: ⌘-return, windows: ctrl-enter

included scripts
jasmine ☁ jquery ☁ jasmine-jquery ☁ coffee-script ☁ jasmine-fixture ☁ an intro

specs
macros describe it expect spyOn beforeEach
results

```
describe 'Calculator', ->
  beforeEach ->
    @calc = new Calculator
  it 'should add two numbers together', ->
    expect(@calc.Add(1,1)).toEqual(2)
```

Jasmine 1.0.2 revision 1298837858 Show ☐ passed ☐ skipped

```
1 spec, 0 failures in 0.02s Finished at Tue Jun 21 2011 01:43:04 GMT-0500 (CDT) run all
```

```
function Calculator () {
  this.Add = function(num1, num2){
    return num1 + num1;
  }
}
```

I am done.

Questions?

http://speakerrate.com/talks/7840-testing-javascript-with-jasmine

References:

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http://blog.carbonfive.com/2010/10/21/rspec-best-practices/