Stop Making Excuses and Start Testing Your JavaScript!

About Me

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Today’s Agenda

- Adding Testing to Your Project
- Writing Testable JavaScript
- Solving Common Testing Issues
- Automating Testing

Adding Testing To Your Project

Step 1: Pick Your Environment

node JS ™

Jasmine

mocha

Browser

Step 2: Pick Your Dialect

expect

```
describe( 'adder', function(){
  it( 'should return zero when no args...',
    function(){
      expect( adder() ).to.equal( 0 );
  } );
} );
```

Jasmine

mocha + chai

should

```
describe( 'adder', function(){
  it( 'should return zero when no args...',
    function(){
      adder().should.equal( 0 );
  } );
} );
```

mocha + chai

assert

```
//qunit
test( 'adder', function(){
  ok( adder() === 0, 'should return 0');
} );

//chai
describe( 'adder', function(){
  assert.equal( adder() , 0, 'should return 0' );
});
```

Qu QUnit js unit testing

mocha + chai

Step 3: Setup

```
$ npm install -g mocha &&
  npm install chai --save-dev
```

adderSpec.js

```
var expect = require( 'chai' ).expect;
var adder = require( '../../src/adder' );

describe( 'adder', function(){
    it( 'should add an array of numbers', function()
{
        expect( adder( 1,2,3) ).to.equal( 6 );
    });
})
```

adderSpec.js

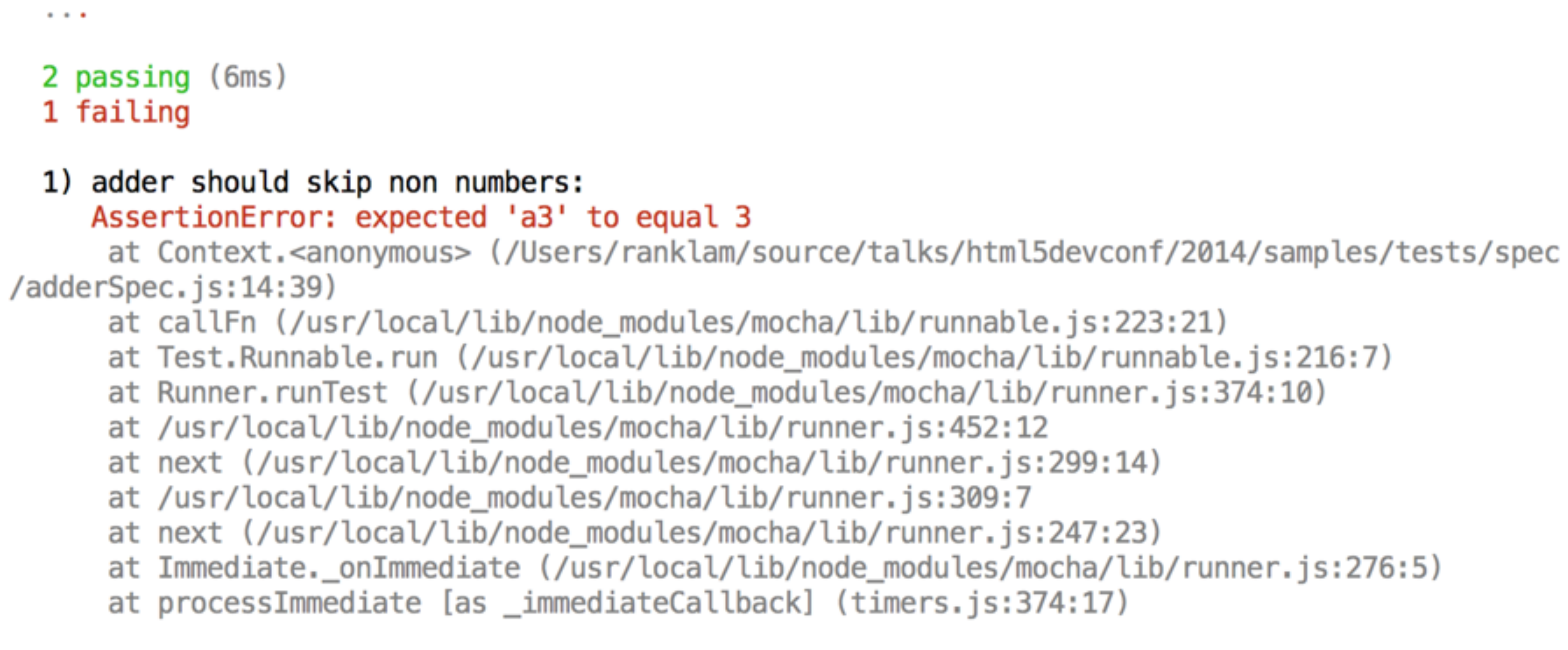
```
...
describe( 'adder', function(){
    it( 'should return zero if no args are passed
in', function(){
        expect( adder(0) ).to.equal(0);
    });
})
...
```

adderSpec.js

```
...
    it( 'should skip non numbers', function(){
        expect( adder( 1,2,'a' ) ).to.equal( 3 );
    });
...
```

```
$ mocha tests/spec
```

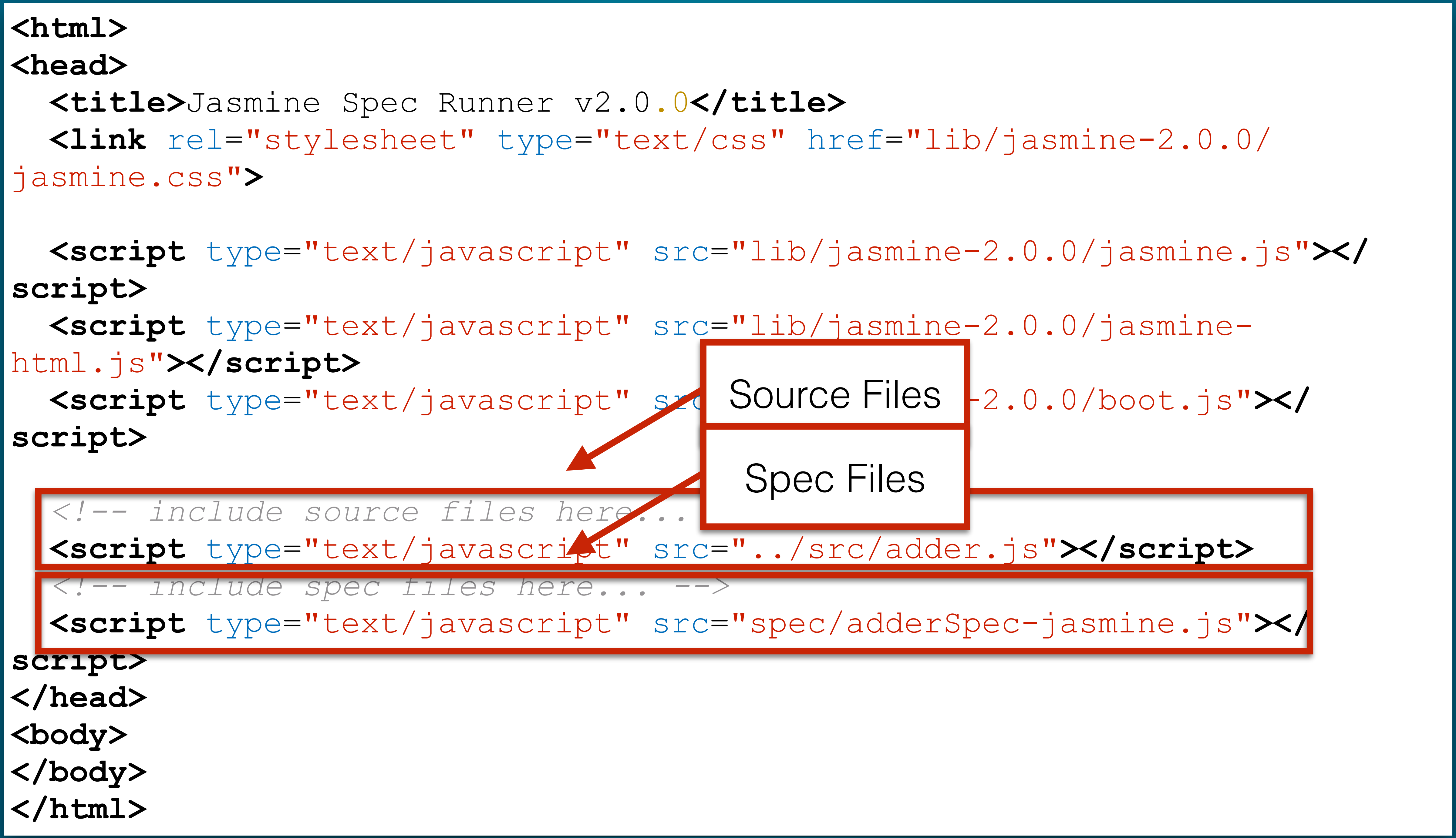
Name of your spec directory



```
  ...

  2 passing (6ms)
  1 failing

  1) adder should skip non numbers:
     AssertionError: expected 'a3' to equal 3
      at Context.<anonymous> (/Users/ranklam/source/talks/html5devconf/2014/samples/tests/spec
/adderSpec.js:14:39)
      at callFn (/usr/local/lib/node_modules/mocha/lib/runnable.js:223:21)
      at Test.Runnable.run (/usr/local/lib/node_modules/mocha/lib/runnable.js:216:7)
      at Runner.runTest (/usr/local/lib/node_modules/mocha/lib/runner.js:374:10)
      at /usr/local/lib/node_modules/mocha/lib/runner.js:452:12
      at next (/usr/local/lib/node_modules/mocha/lib/runner.js:299:14)
      at /usr/local/lib/node_modules/mocha/lib/runner.js:309:7
      at next (/usr/local/lib/node_modules/mocha/lib/runner.js:247:23)
      at Immediate._onImmediate (/usr/local/lib/node_modules/mocha/lib/runner.js:276:5)
      at processImmediate [as _immediateCallback] (timers.js:374:17)
```

Browser

SpecRunner.html

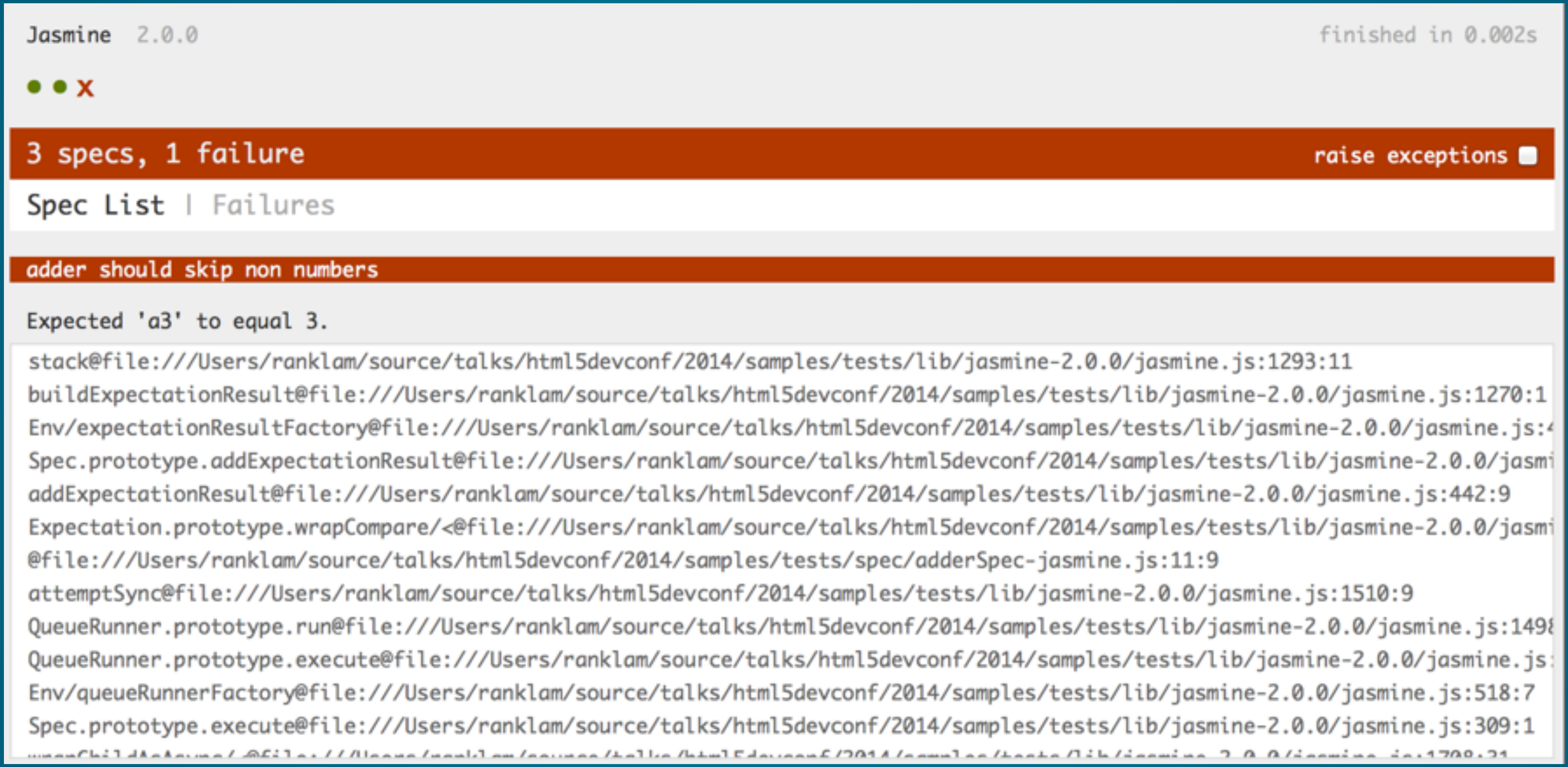


```
<html>
<head>
  <title>Jasmine Spec Runner v2.0.0</title>
  <link rel="stylesheet" type="text/css" href="lib/jasmine-2.0.0/
jasmine.css">

  <script type="text/javascript" src="lib/jasmine-2.0.0/jasmine.js"></
script>
  <script type="text/javascript" src="lib/jasmine-2.0.0/jasmine-
html.js"></script>
  <script type="text/javascript" sr                -2.0.0/boot.js"></
script>

  <!-- include source files here...
  <script type="text/javascript" src="../src/adder.js"></script>
  <!-- include spec files here... -->
  <script type="text/javascript" src="spec/adderSpec-jasmine.js"></
script>
</head>
<body>
</body>
</html>
```

Source Files

Spec Files

Browser



Jasmine 2.0.0 finished in 0.002s

● ● x

3 specs, 1 failure raise exceptions □

Spec List | Failures

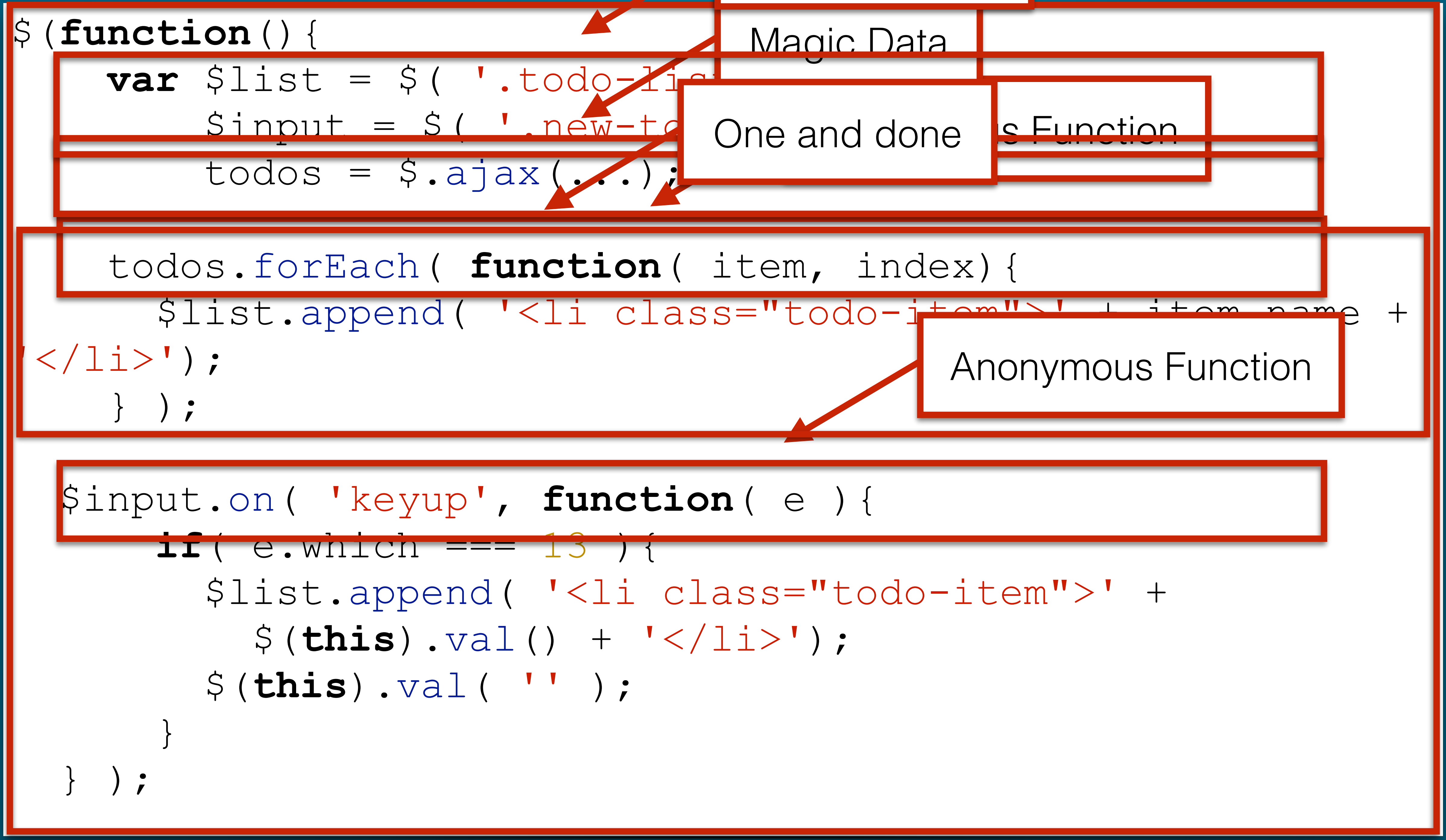
adder should skip non numbers

Expected 'a3' to equal 3.

```
stack@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:1293:11
buildExpectationResult@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:1270:1
Env/expectationResultFactory@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:4
Spec.prototype.addExpectationResult@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmi
addExpectationResult@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:442:9
Expectation.prototype.wrapCompare/<@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmi
@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/spec/adderSpec-jasmine.js:11:9
attemptSync@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:1510:9
QueueRunner.prototype.run@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:149
QueueRunner.prototype.execute@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js
Env/queueRunnerFactory@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:518:7
Spec.prototype.execute@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:309:1
wrapChildAsAsync/<@file:///Users/ranklam/source/talks/html5devconf/2014/samples/tests/lib/jasmine-2.0.0/jasmine.js:1708:21
```

Writing Testable JavaScript

Not Testable JavaScript



```
$(function(){
  var $list = $( '.todo-lis
      $input = $( '.new-to
      todos = $.ajax(...);

  todos.forEach( function( item, index){
    $list.append( '<li class="todo-item">' + item.name +
'</li>');
  } );

 $input.on( 'keyup', function( e ){
    if( e.which === 13 ){
      $list.append( '<li class="todo-item">' +
        $(this).val() + '</li>');
      $(this).val( '' );
    }
 } );
```

Locked in callback

Can't configure

Magic Data

One and done

s Function

Anonymous Function

A Few More Tips

- Avoid Singletons
- Write MAINTAINABLE tests
- Use named functions instead of anonymous callbacks
- Keep your functions small

Solving Common Testing Issues

I Have Methods that Call Other Methods.

Mocks & Stubs

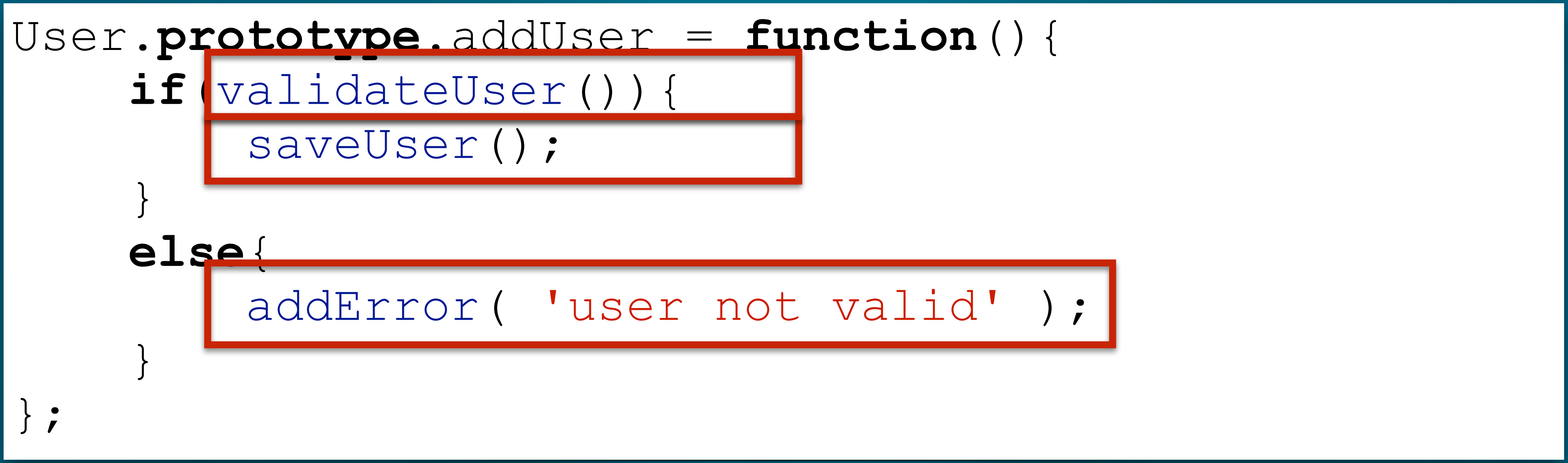
Use **mocks** when testing a function that needs data from another function

Use **stubs** when testing a function that invokes another function

Spies

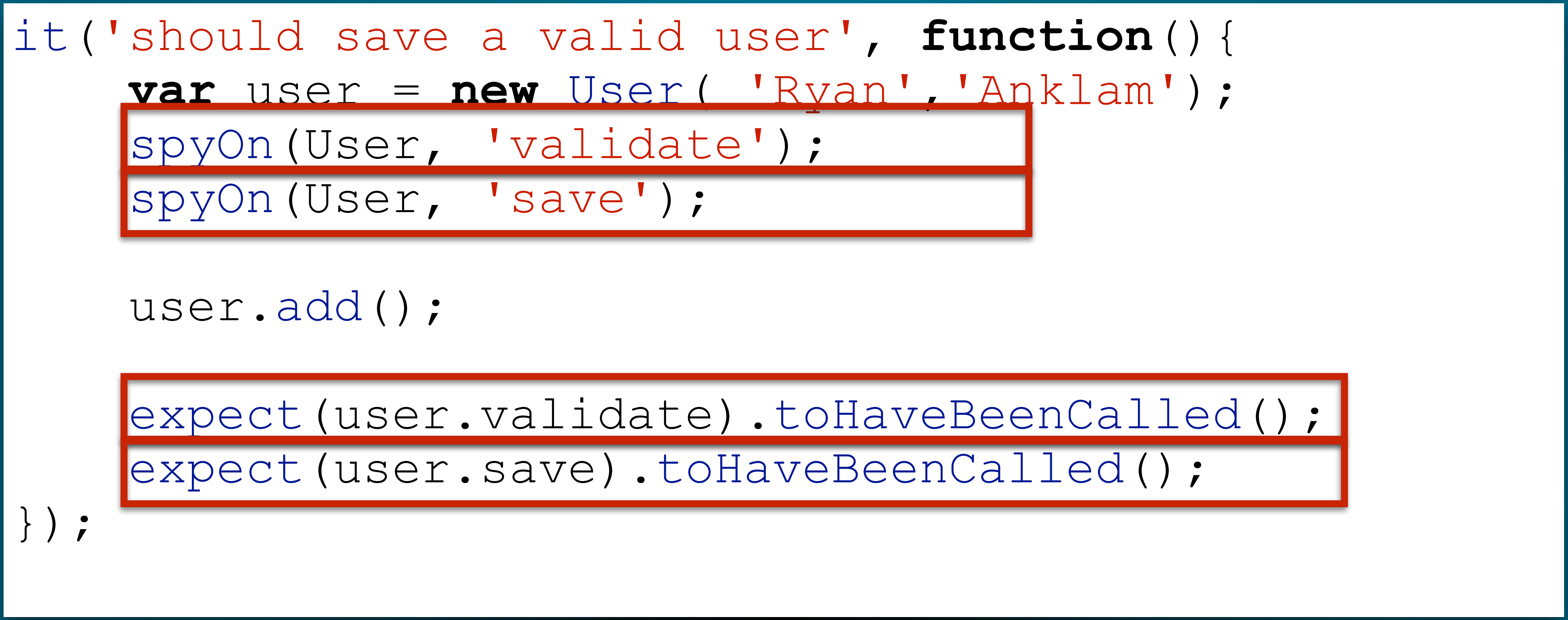
Jasmine
Sinon.JS

Stubbing



```
User.prototype.addUser = function(){
    if(validateUser()){
        saveUser();
    }
    else{
        addError( 'user not valid' );
    }
};
```

Stubbing



```
it('should save a valid user', function(){
    var user = new User( 'Ryan','Anklam');
    spyOn(User, 'validate');
    spyOn(User, 'save');

    user.add();

    expect(user.validate).toHaveBeenCalled();
    expect(user.save).toHaveBeenCalled();
});
```

Mocking

```
User.prototype.listUsers = function(){
    var users = this.getUsers();

    users.forEach( function( user ){
        this.addUserToList( user );
    });
};
```

Mocking

```
it(‘should get a list of users and add them',
function(){
    spyOn(User, 'getUsers').andReturn(
        [
            {
                firstName : 'Ryan',
                lastName  : 'Anklam'
            }
        ]
    );
    spyOn(User, 'addUserToList');
    user.listUsers();

    expect(user.getUsers).toHaveBeenCalled();
    expect(user.addUserToList).toHaveBeenCalled();
});
```

I Promise It’s Not That Hard

chai-as-promised FTW!

```
it('should save a valid user', function(){
    var user = new User( 'Ryan','Anklam');
    spyOn(User, 'validate');
    spyOn(User, 'save');

    user.add();

    expect(user.validate).toHaveBeenCalled();
    expect(user.save).toHaveBeenCalled();
});
```

Be careful!

<jasmine>

<sinon>

<nsa>

I Need To Test the DOM

Do you REALLY need to?

Spy On The DOM

Jasmine jQuery

qUnit

I Have to Test Async Code

I Have to Test Ajax

Refactoring

```
$(function(){
    var $list = $( '.todo-list' )
        $input = $( '.new-to
        todos = $.ajax(...);

    todos.forEach( function( item, index){
      $list.append( '<li class="todo-item">' + item.name +
'</li>');
    } );

  $input.on( 'keyup', function( e ){
      if( e.which === 13 ){
        $list.append( '<li class="todo-item">' +
          $(this).val() + '</li>');
        $(this).val( '' );
      }
  } );
```

One and done

Spies as Mocks

```
App.prototype.addItems = function( items ){
  items.forEach( function( item, index){
      this.addItem( item.name );
    }, this );
};
```

```
App.prototype.addItem = function( name ){
  this.$list.append( '<li class="todo-item">' + name
+ '</li>');
};
```

Automating Testing

Using Your Build Tool

Testem

Karma

Thank You

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