Cucumber Behavior Driven Development with elegance and joy

Getting Up and Running with BDD on Rails

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Overview

- Behavior Driven Development Basic Concepts
- Cucumber from 10,000 ft
- Cucumber in the Rails Environment
- Writing your first Feature / Scenario
- Additional Resources

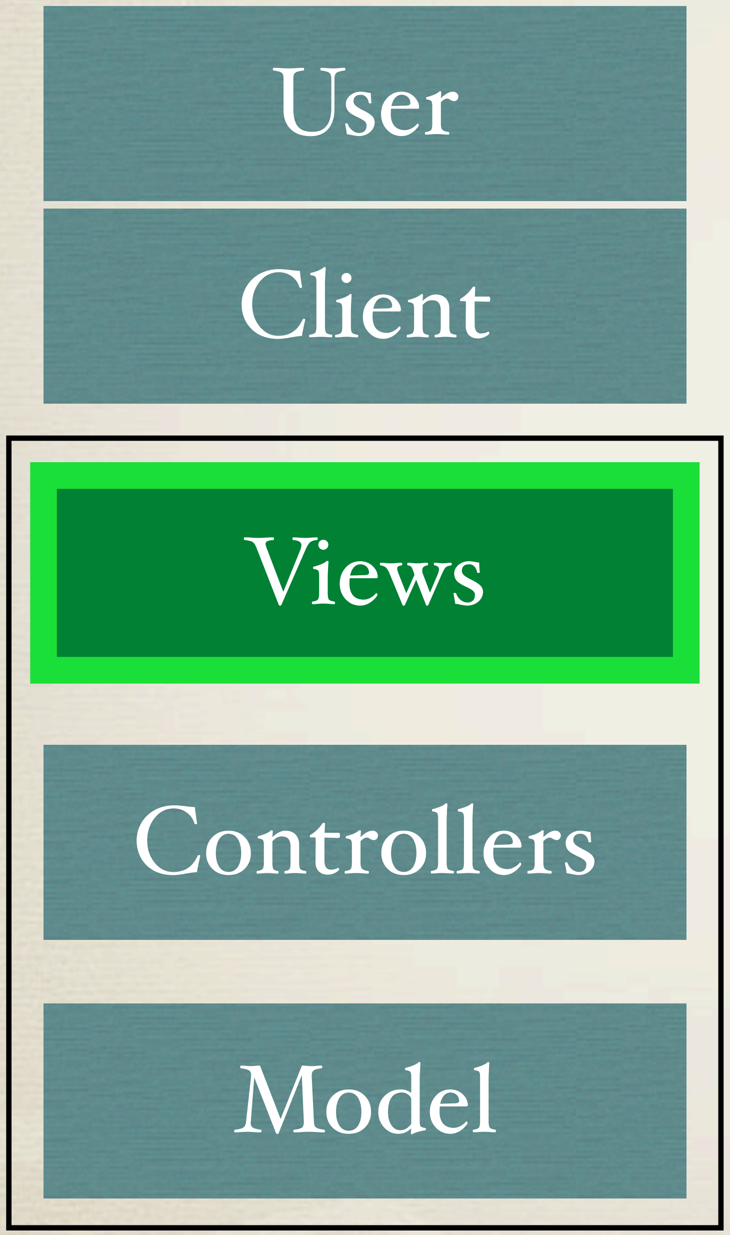
Behavior Driven

- "the next step" from Test-Driven Development
- tests what an object *does* rather than what it *is*
- intention more important than implementation
- outside-in approach
- offers all the benefits of TDD
- it is not Test-After Development

Benefits of TDD/BDD

- more productive (less debugging, fewer prod defects)
- helps drive programming design (KISS/YAGNI)
- delays implementation decisions
- greater level of code trust
- code more modularized, flexible and extensible

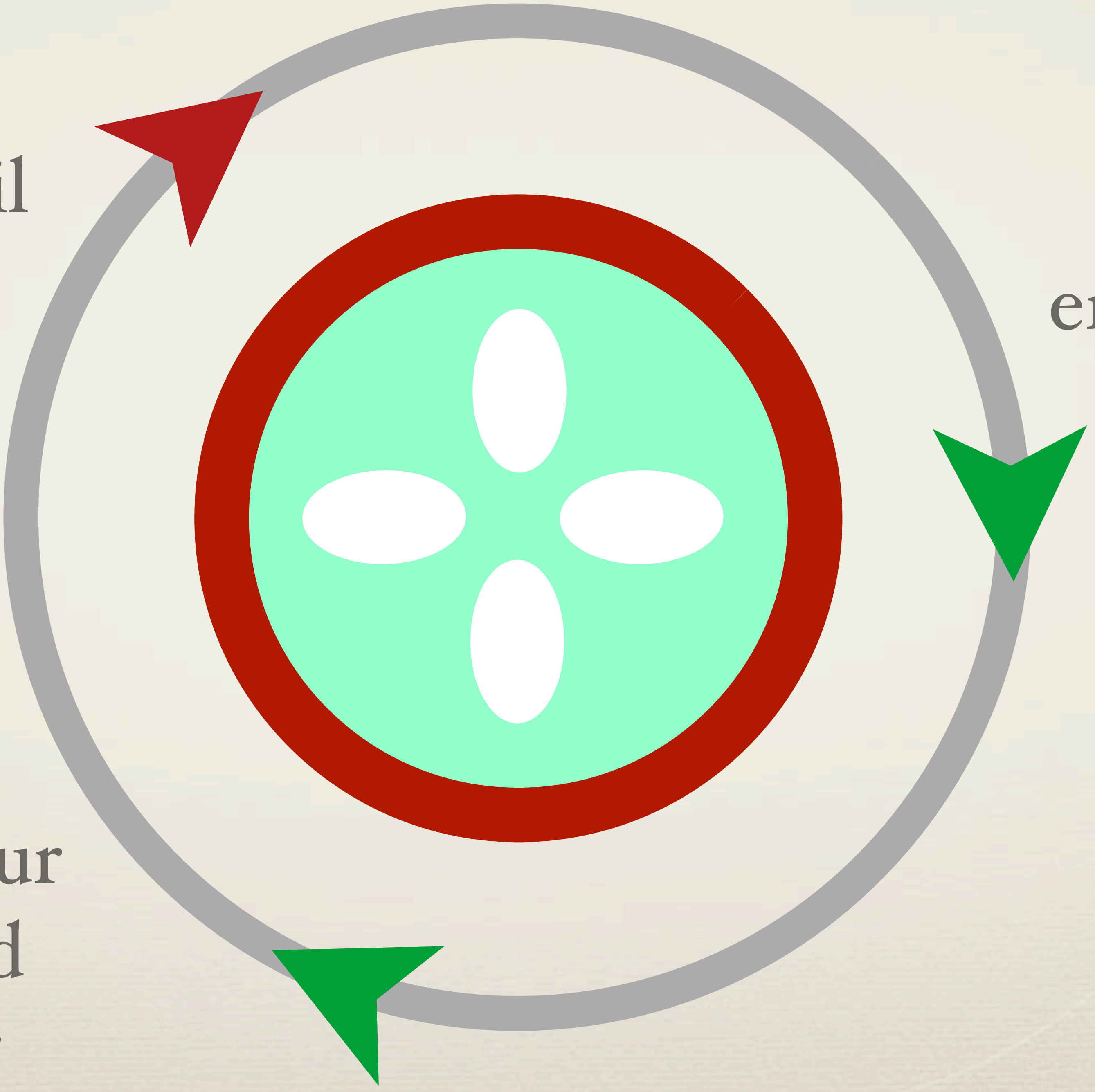
Outside-In



Value is in the **views!**

Often html but can also be programmatic interfaces (such as XML or JSON), remember valuable to the ***user.***

Red Green Refactor

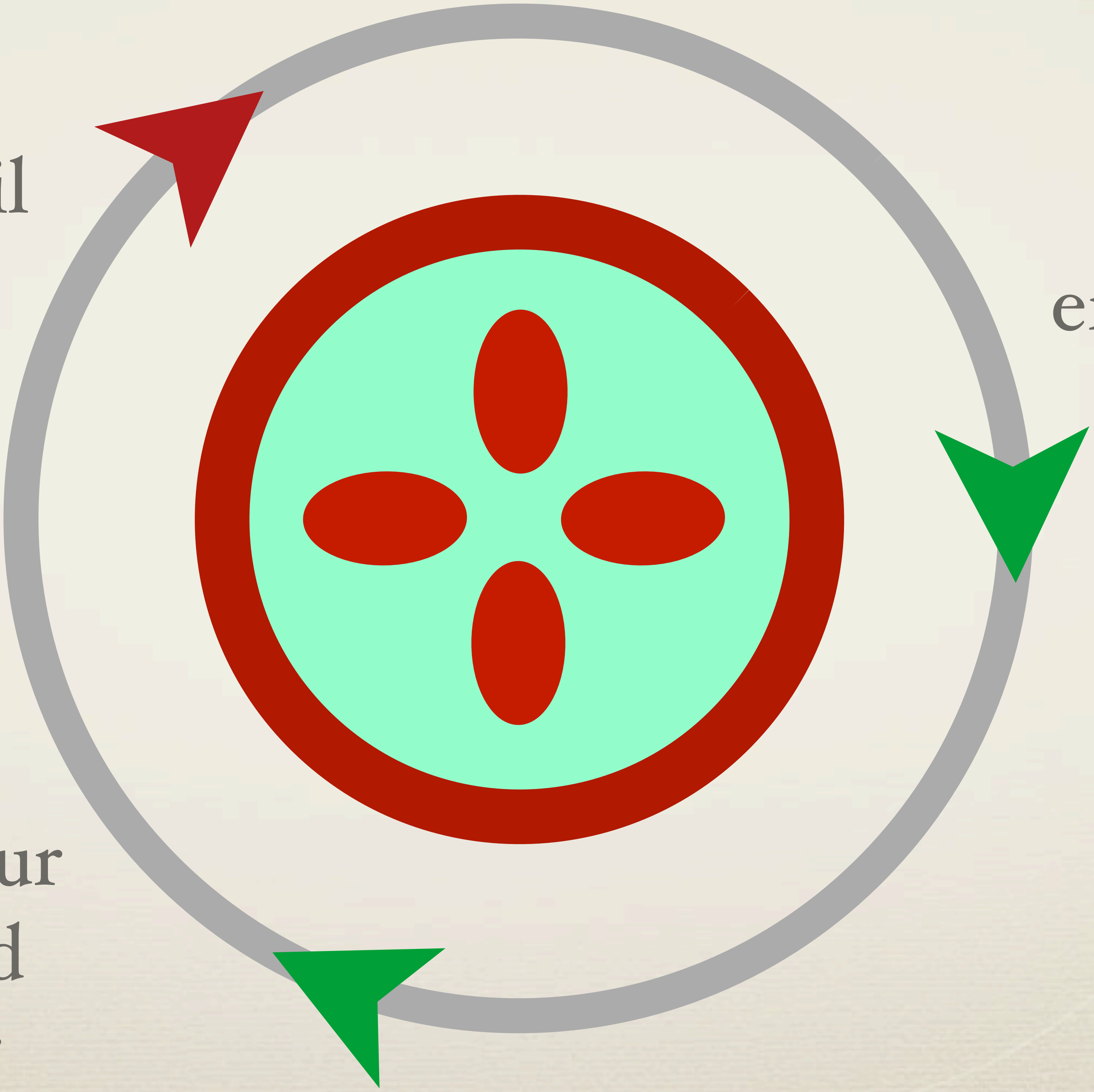


write enough test code to fail

write just enough code to pass

review your work and refactor

Red Green Refactor



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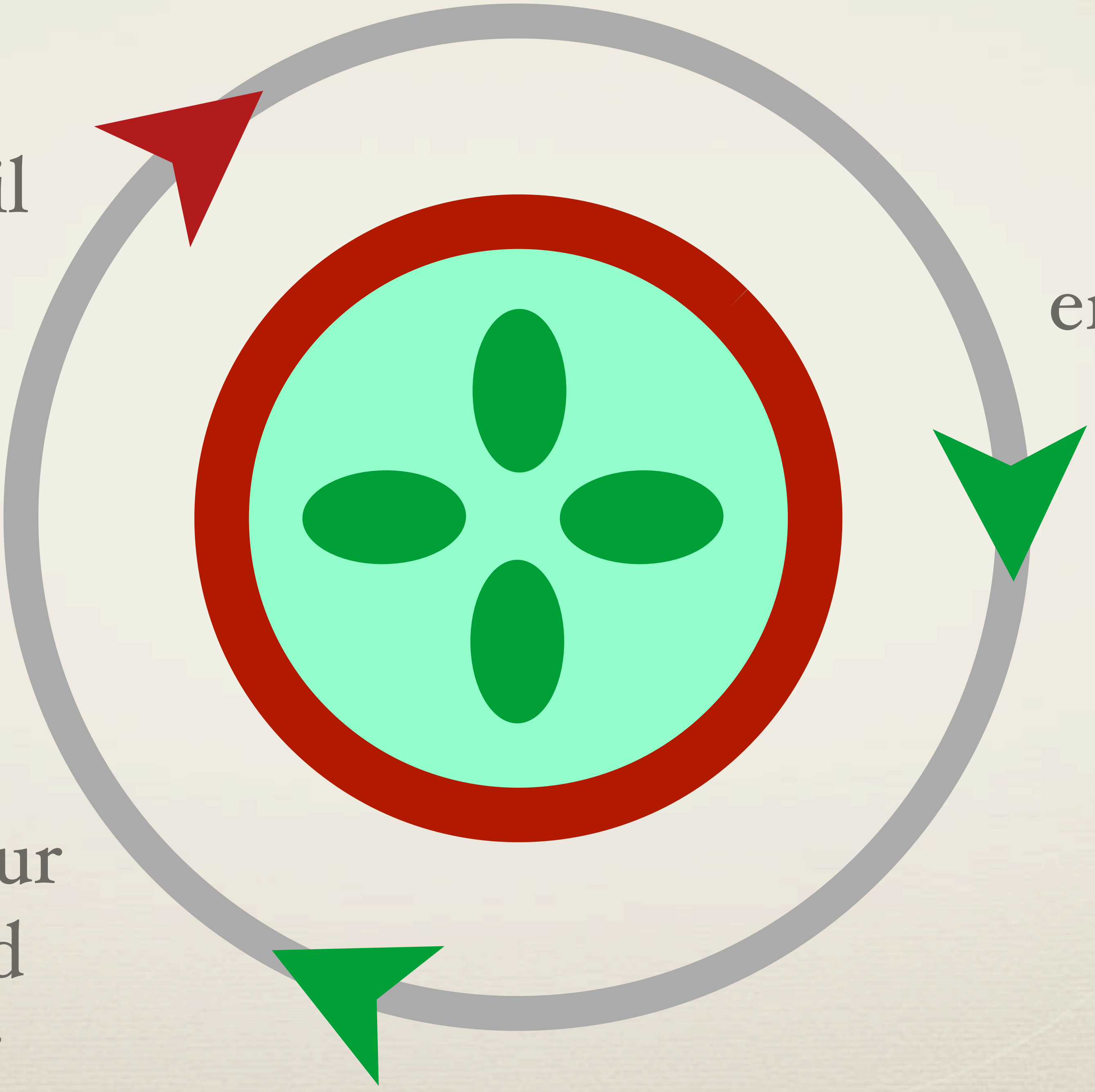

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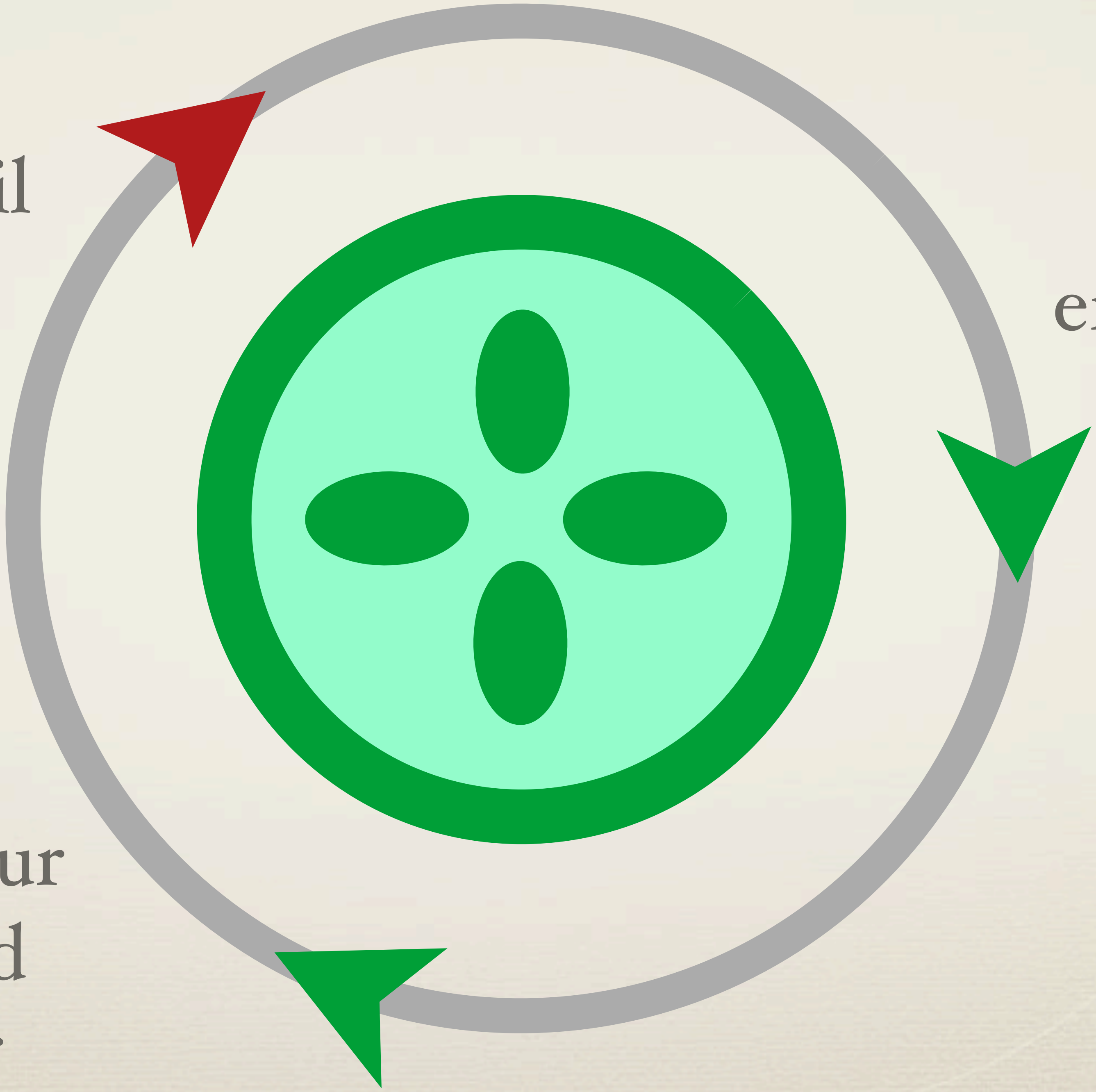
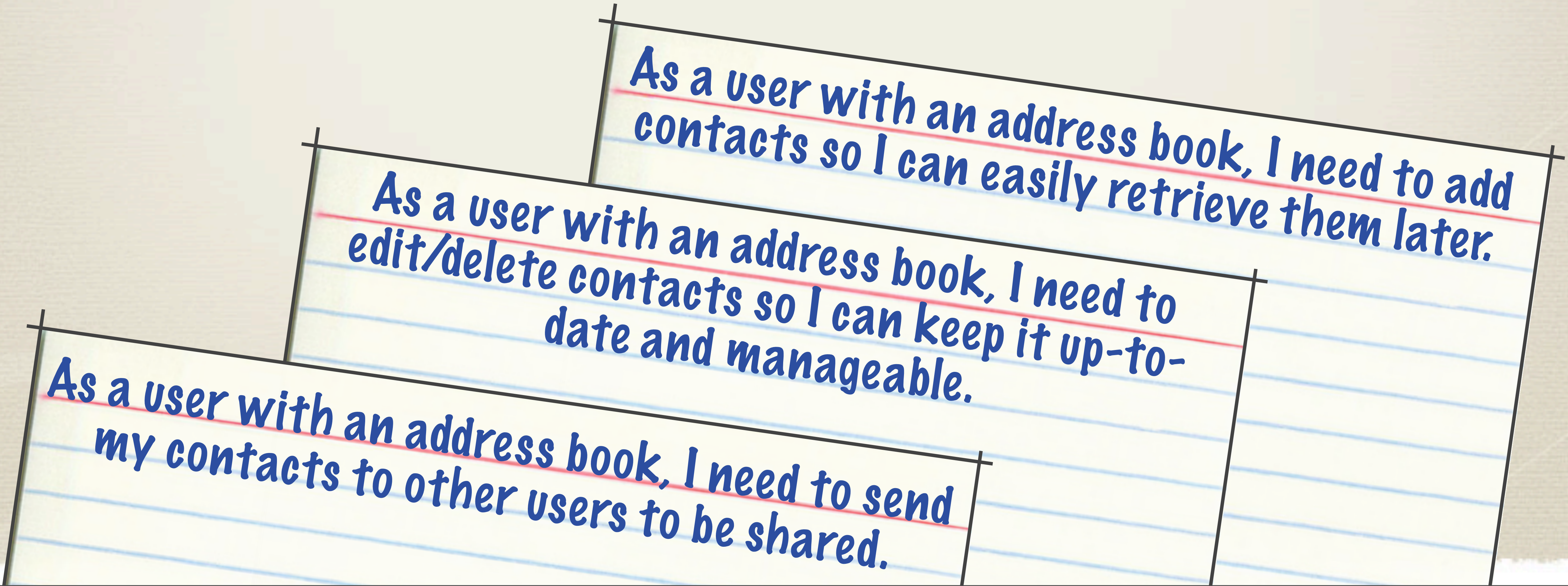


User Stories

* concept popular in Agile practices like Scrum and XP
* define the user's role, what it is they need/want to do, and why they need/want (the value)



As a user with an address book, I need to add contacts so I can easily retrieve them later.

As a user with an address book, I need to edit/delete contacts so I can keep it up-to-date and manageable.

As a user with an address book, I need to send my contacts to other users to be shared.

Pop the Why Stack

- Ask “Why” up to 5 times
- Stop when you find the money
  - Protect revenue
  - Increase revenue
  - Manage cost

Example Pop'in

c: 'People need to log in.'
d: 'Why?'
c: 'Um, identify users?'
d: 'Why do you need to identify users?'
c: 'So we know who's publishing what.'
d: 'Why would you need to know who publishes what?'
c: 'If content belongs to someone it seems trustworthy.'
d: 'Why does content need to be trustworthy?'
c: 'People will be more interested in the content if so.'
d: 'Why do you need people interested in the content?'
c: 'So people come back and visit the site?'
d: 'Why do you want people to come back and revisit?'
c: 'More visits will increase our ad revenue.'

The Story

As an author, I need to log into the site
so that articles I create are associated to me
and seem trustworthy, driving more traffic to the site.

The Story

So that articles I create are associated to me, seem trustworthy and drive more traffic to the site,
as an author, I need to log in.

Enter Cucumber

- Dan North ported JBehave to Ruby as RBehave
- RSpec merged RBehave in as the Story Runner
  - First only supported Ruby for scenarios
  - Later supported plain text, but still limited
- Aslak Hellesøy in 2008 rewrote Story Runner as Cucumber (named so by his fiancée)
- Cucumber has since taken to a life of it’s own

Cucumber

- written in Ruby itself and best matched with Ruby projects, but can be used for Java, .NET or Flex
- supports web apps in any language:
  - integrates with Webrat, Watir, Selenium, et. al.
  - Gherkin customization edit `/cucumber/languages.yml`
- minimum knowledge of Ruby required, you can pick it up and get going in a few days

Gherkin: the 'unpickle' variety

- a business readable, domain specific language that Cucumber understands
- two-stage parser for input file (plain text):
  1. divides the file into sections (eg. feature, scenarios)
  2. sections are divided into steps
- step-definitions are always matched by Ruby methods
- line-oriented (like YAML); line endings terminate statements (steps) and spaces or tabs to indent

Given When Then

- Used extensively in scenario definitions (Gherkin)
- Use “And” to chain together

```
Given an invalid user
When I go to the sign-in page
And I fill in "userlogin" with "baduser"
And I fill in "password" with "badpassword"
And I submit "new_user_session"
Then I should see "Sorry, we could not sign you in."
And I should see "Login"
```

Installing in Rails

```
gem install cucumber rspec-rails webrat
```

/config/environments/test.rb

```
config.gem 'rspec-rails', :lib => false
config.gem 'rspec', :lib => false
config.gem 'cucumber'
config.gem 'webrat'
```

```
rake gems:install RAILS_ENV=test
script/generate cucumber
script/generate rspec
```

Test::Unit Shoulda

http://giantrobots.thoughtbot.com/2009/2/20/mixing-cucumber-with-test-unit

/features/support/env.rb
```
# require 'cucumber/rails/rspec'
# require 'webrat/rspec-rails'
```

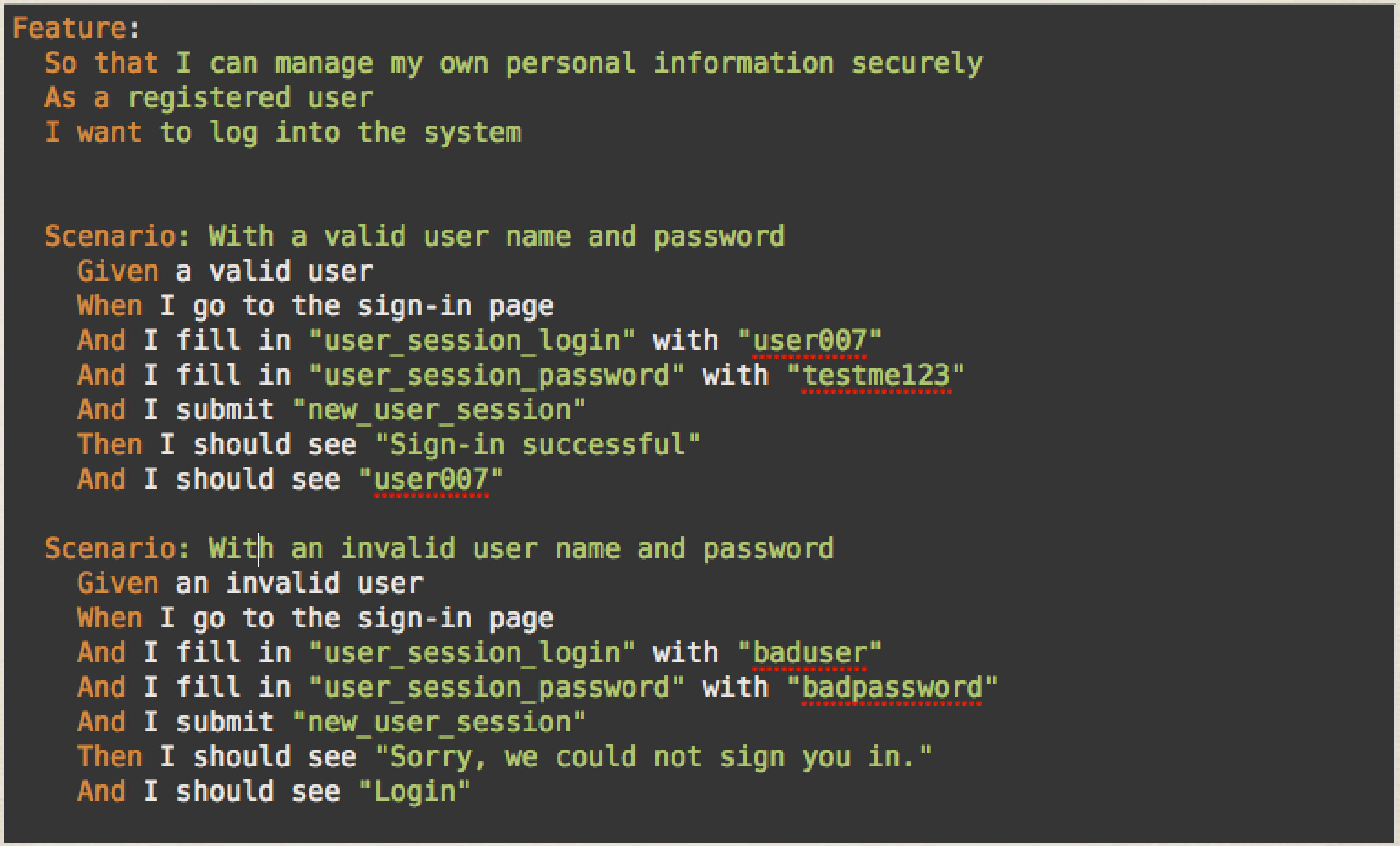
/features/step_definitions/webrat_steps.rb
```
# replace any matchers that use RSpec syntax

Then /^I should see "(.*)"$/ do |text|
  # response.body.should =~ /#{text}/m
  assert_match /#{text}/m, @response.body
end
```

Out of the Box

- Webrat comes with a bunch of handy helpers out of the box to make life easy for web application scenarios
- rake features - task to run all Cucumber tests

```
/features
  review_past_events.feature
  /step_definitions
    event_steps.rb
    webrat_steps.rb
  /support
    env.rb
    paths.rb
```

Features



```
Feature:
  So that I can manage my own personal information securely
  As a registered user
  I want to log into the system


  Scenario: With a valid user name and password
    Given a valid user
    When I go to the sign-in page
    And I fill in "user_session_login" with "user007"
    And I fill in "user_session_password" with "testme123"
    And I submit "new_user_session"
    Then I should see "Sign-in successful"
    And I should see "user007"

  Scenario: With an invalid user name and password
    Given an invalid user
    When I go to the sign-in page
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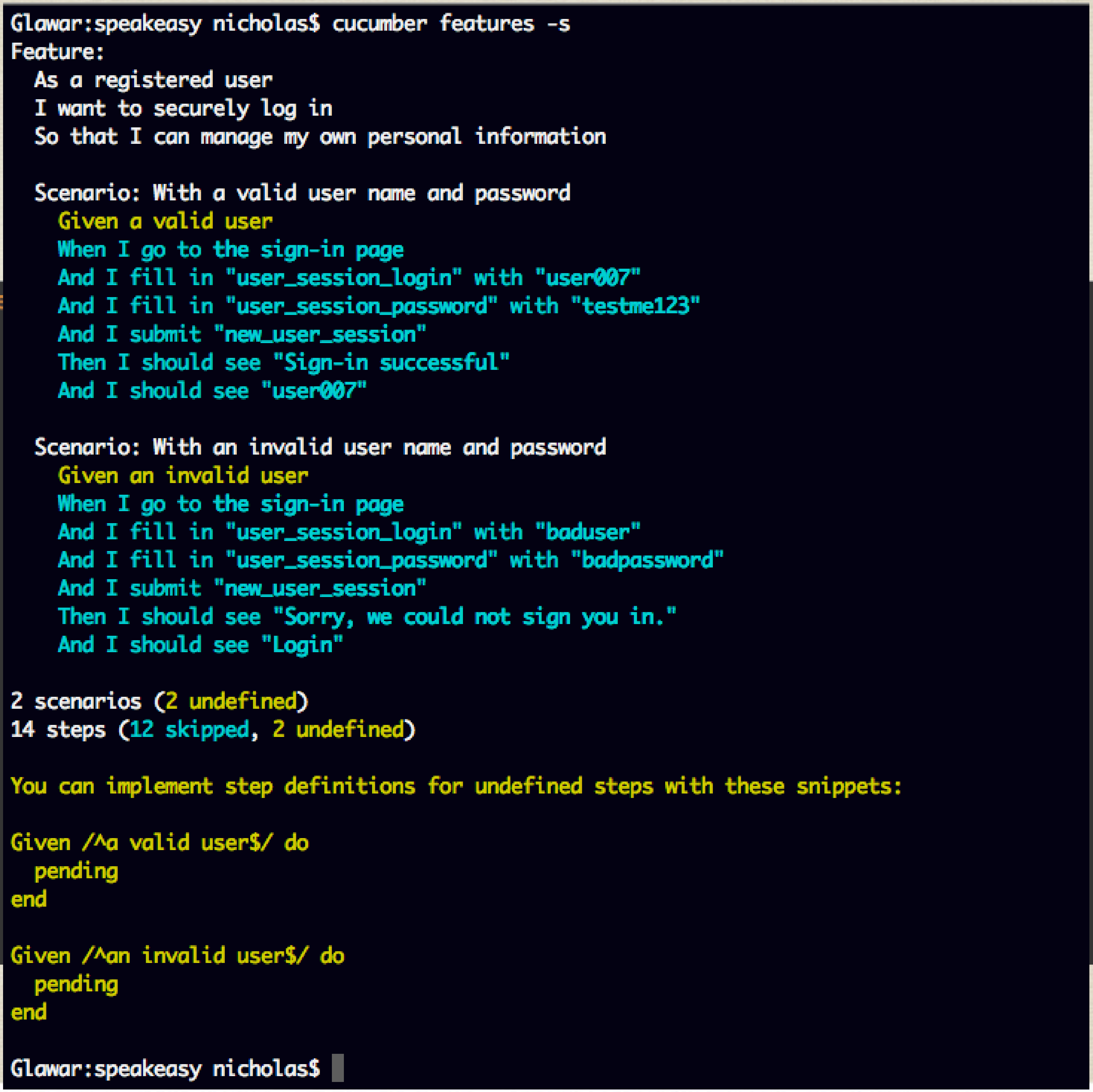

```
Glawar:speakeasy nicholas$ cucumber features -s
Feature:
  As a registered user
  I want to securely log in
  So that I can manage my own personal information

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    Then I should see "Sorry, we could not sign you in."
    And I should see "Login"

2 scenarios (2 undefined)
14 steps (12 skipped, 2 undefined)

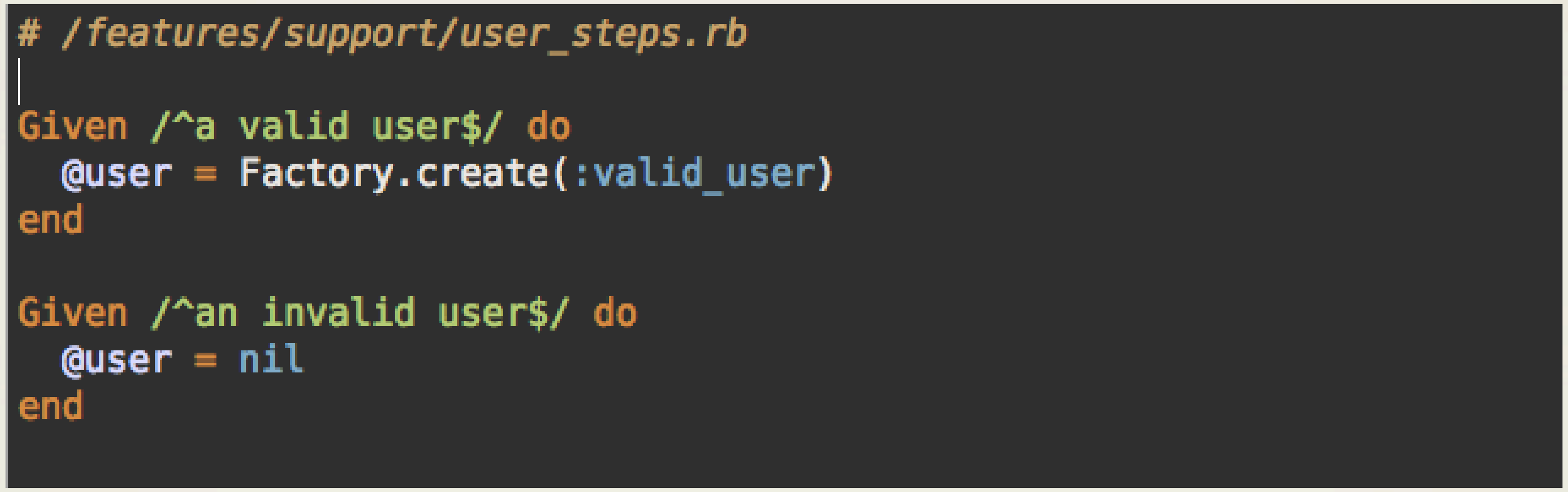
You can implement step definitions for undefined steps with these snippets:

Given /^a valid user$/ do
  pending
end

Given /^an invalid user$/ do
  pending
end

Glawar:speakeasy nicholas$
```

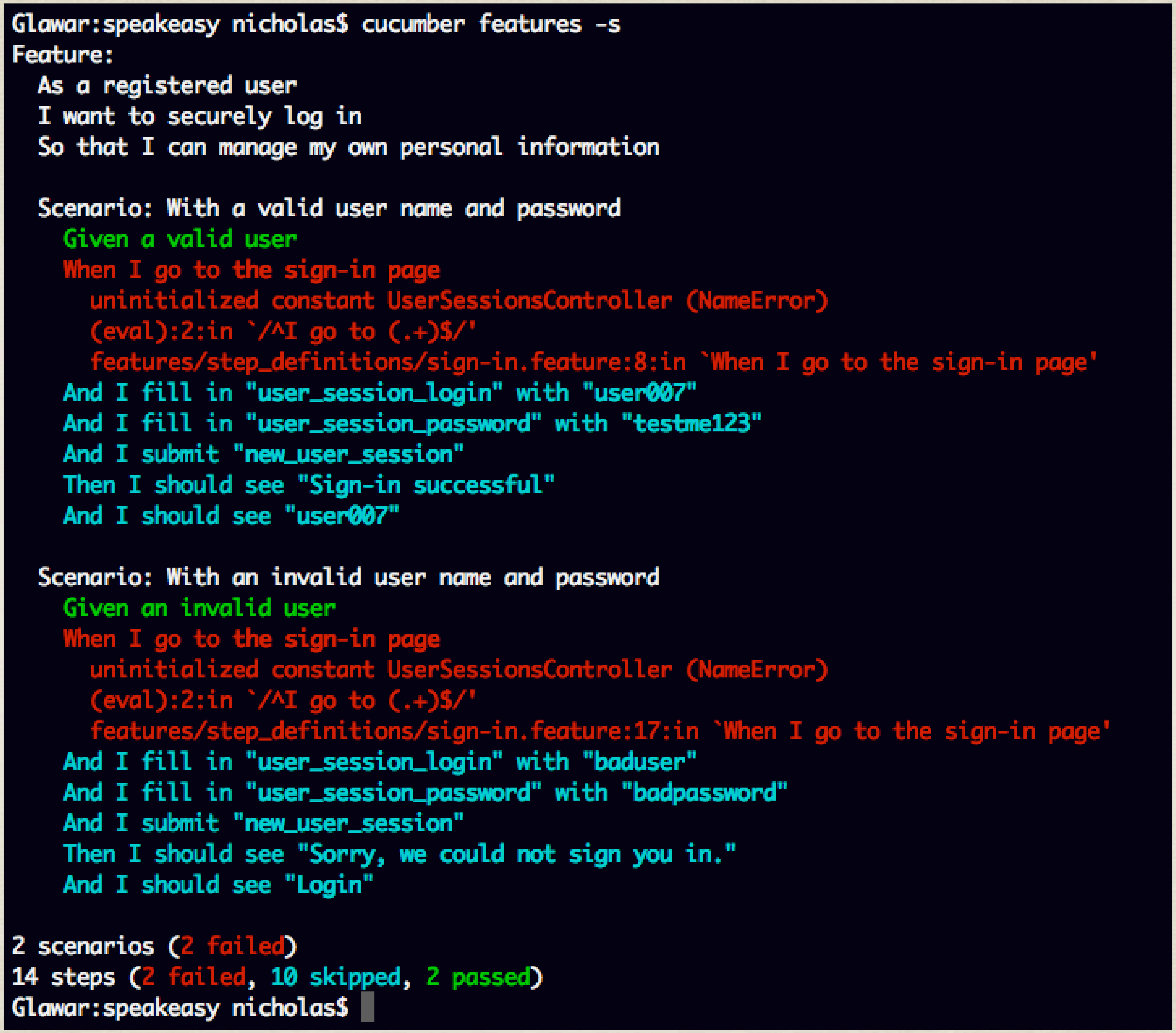
Step Definition



```
# /features/support/user_steps.rb

Given /^a valid user$/ do
  @user = Factory.create(:valid_user)
end

Given /^an invalid user$/ do
  @user = nil
end
```



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Glawar:speakeasy nicholas$ cucumber features -s
Feature:
  As a registered user
  I want to securely log in
  So that I can manage my own personal information

  Scenario: With a valid user name and password
    Given a valid user
    When I go to the sign-in page
      uninitialized constant UserSessionsController (NameError)
      (eval):2:in `/^I go to (.+)$/'
      features/step_definitions/sign-in.feature:8:in `When I go to the sign-in page'
    And I fill in "user_session_login" with "user007"
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  Scenario: With an invalid user name and password
    Given an invalid user
    When I go to the sign-in page
      uninitialized constant UserSessionsController (NameError)
      (eval):2:in `/^I go to (.+)$/'
      features/step_definitions/sign-in.feature:17:in `When I go to the sign-in page'
    And I fill in "user_session_login" with "baduser"
    And I fill in "user_session_password" with "badpassword"
    And I submit "new_user_session"
    Then I should see "Sorry, we could not sign you in."
    And I should see "Login"

2 scenarios (2 failed)
14 steps (2 failed, 10 skipped, 2 passed)
Glawar:speakeasy nicholas$
```
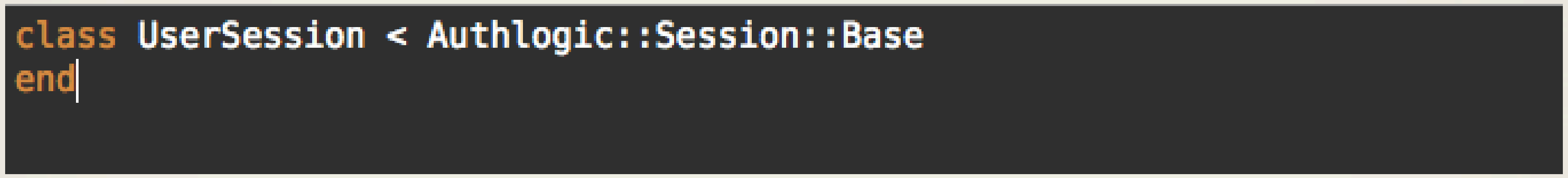
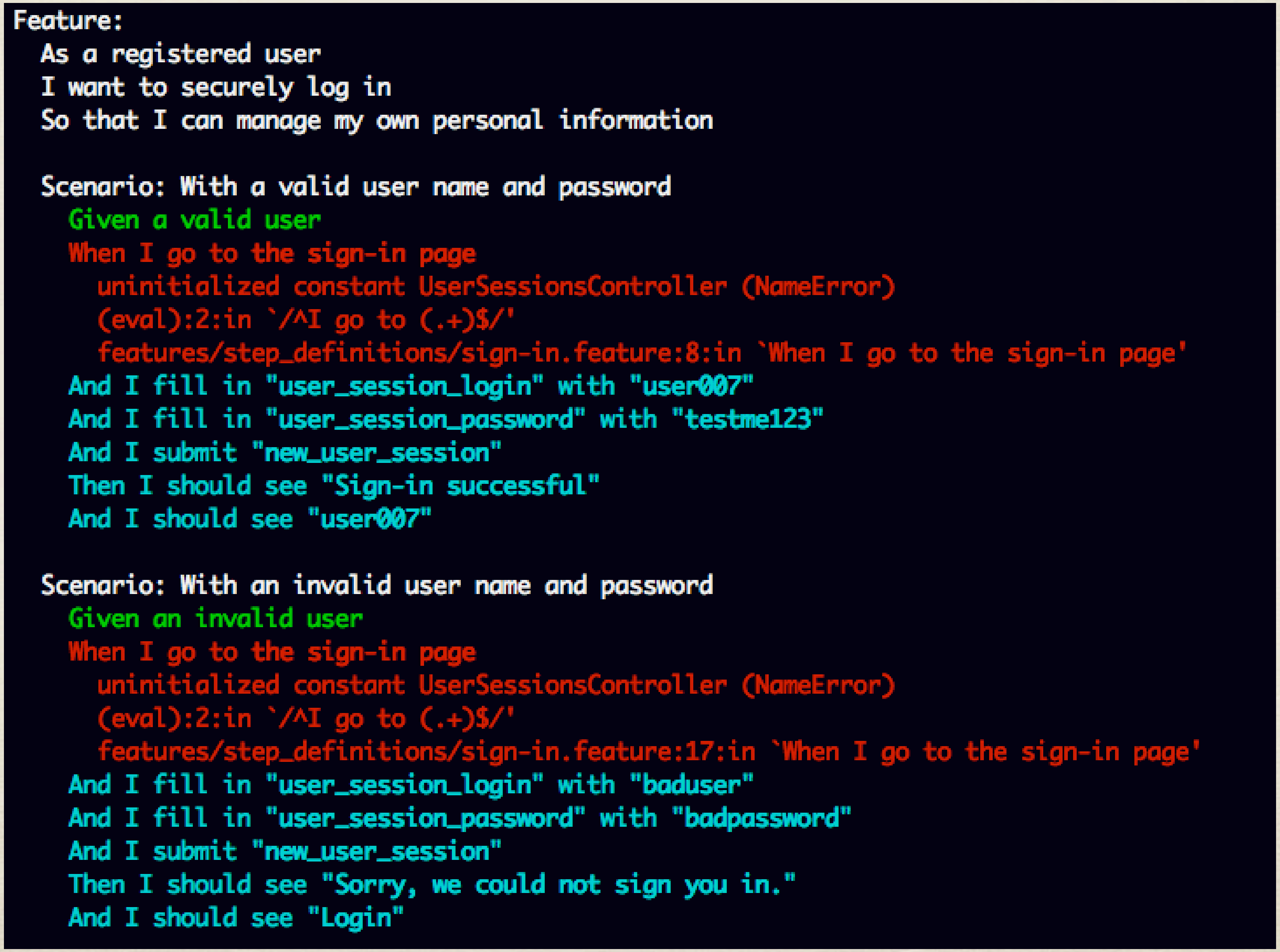

Cukeing



```ruby
class UserSession < Authlogic::Session::Base
end
```

Cukeing



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Feature:
  As a registered user
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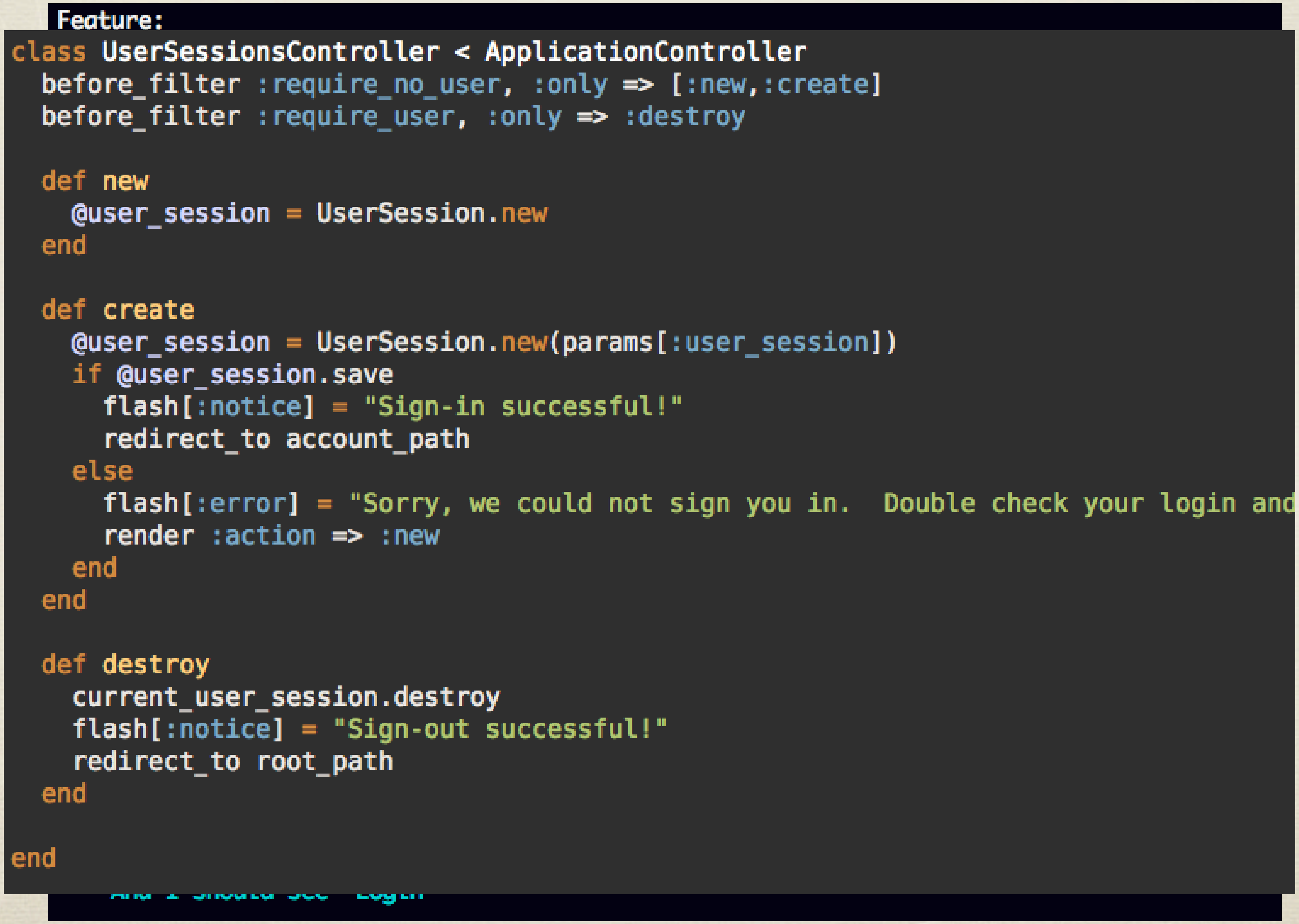
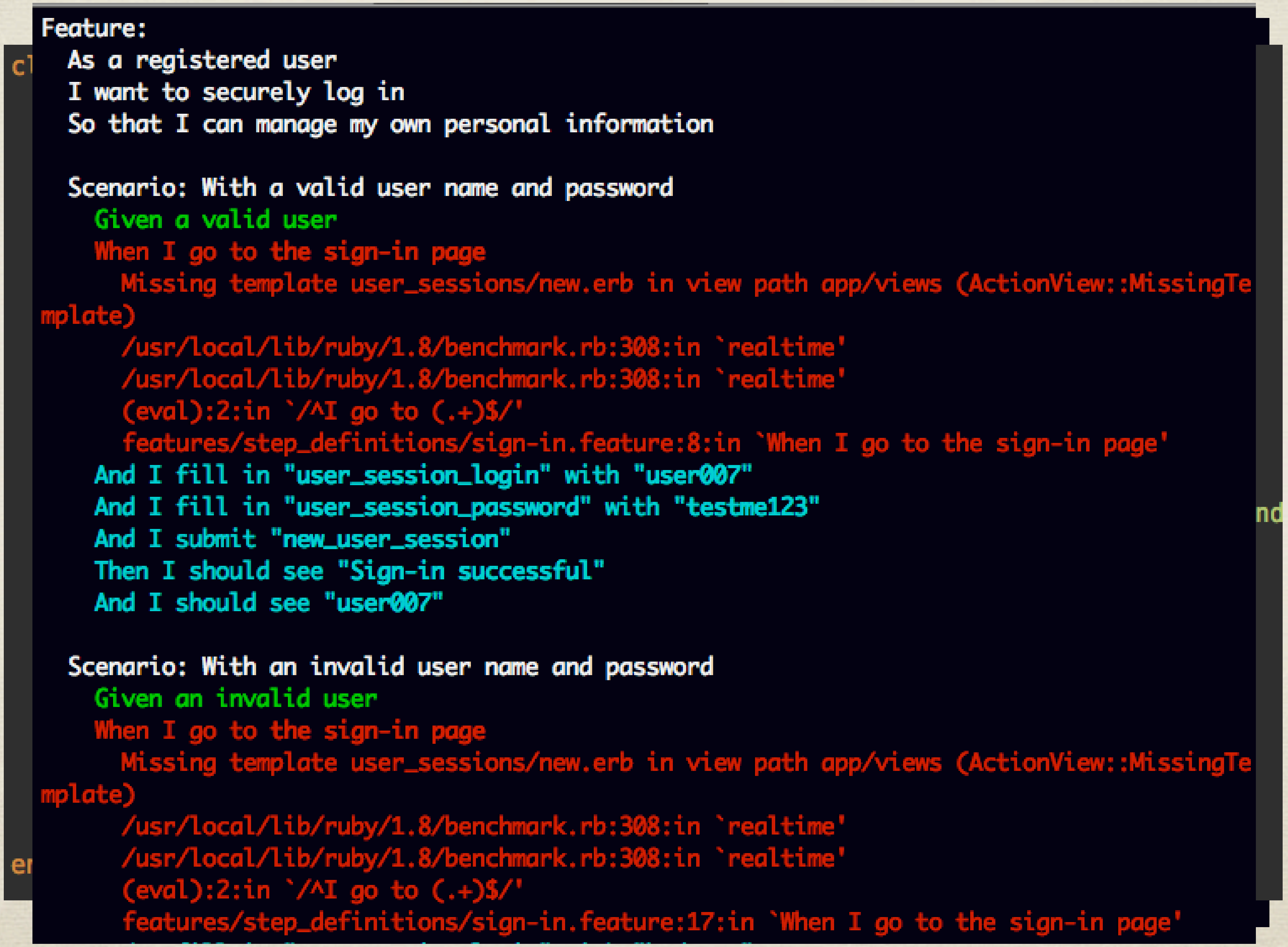


```
Feature:
```

```ruby
class UserSessionsController < ApplicationController
  before_filter :require_no_user, :only => [:new,:create]
  before_filter :require_user, :only => :destroy

  def new
    @user_session = UserSession.new
  end

  def create
    @user_session = UserSession.new(params[:user_session])
    if @user_session.save
      flash[:notice] = "Sign-in successful!"
      redirect_to account_path
    else
      flash[:error] = "Sorry, we could not sign you in.  Double check your login and
      render :action => :new
    end
  end

  def destroy
    current_user_session.destroy
    flash[:notice] = "Sign-out successful!"
    redirect_to root_path
  end

end
```

```
    And I should see "Login"
```

Cukeing



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  Scenario: With a valid user name and password
    Given a valid user
    When I go to the sign-in page
      Missing template user_sessions/new.erb in view path app/views (ActionView::MissingTe
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      /usr/local/lib/ruby/1.8/benchmark.rb:308:in `realtime'
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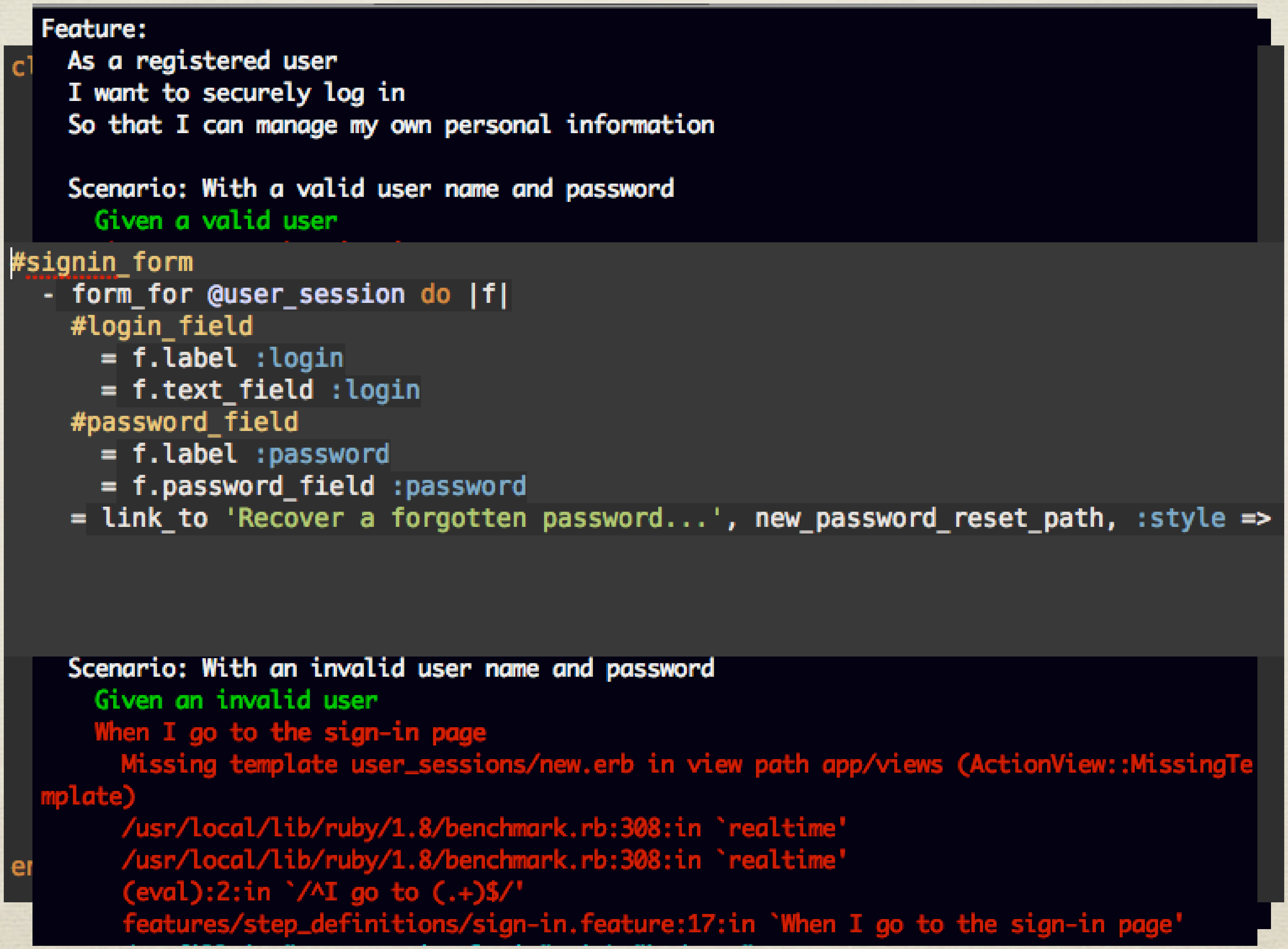

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  As a registered user
  I want to securely log in
  So that I can manage my own personal information

  Scenario: With a valid user name and password
    Given a valid user
```

```
#signin_form
  - form_for @user_session do |f|
    #login_field
      = f.label :login
      = f.text_field :login
    #password_field
      = f.label :password
      = f.password_field :password
    = link_to 'Recover a forgotten password...', new_password_reset_path, :style =>
```

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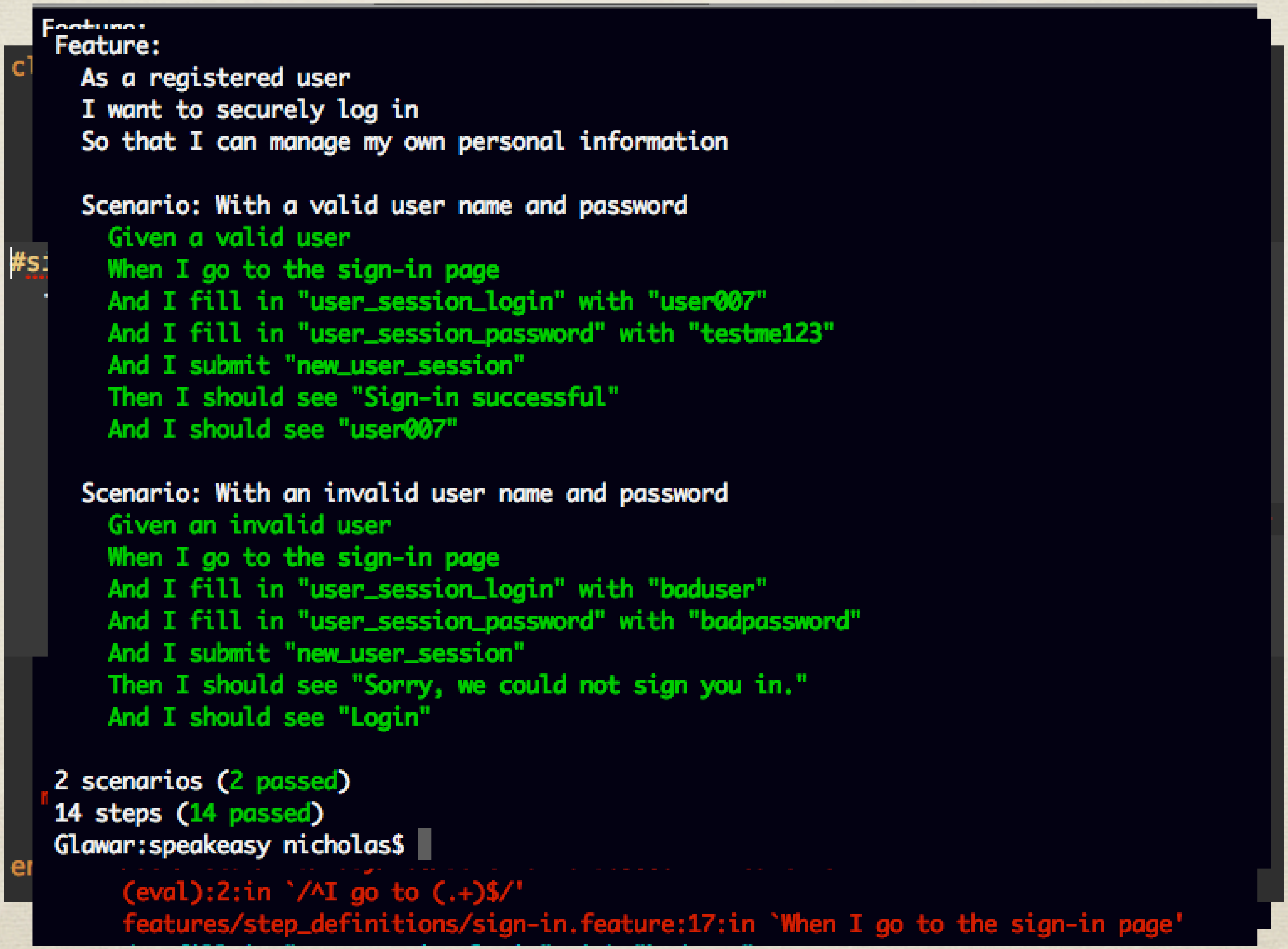

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2 scenarios (2 passed)
14 steps (14 passed)
Glawar:speakeasy nicholas$ 
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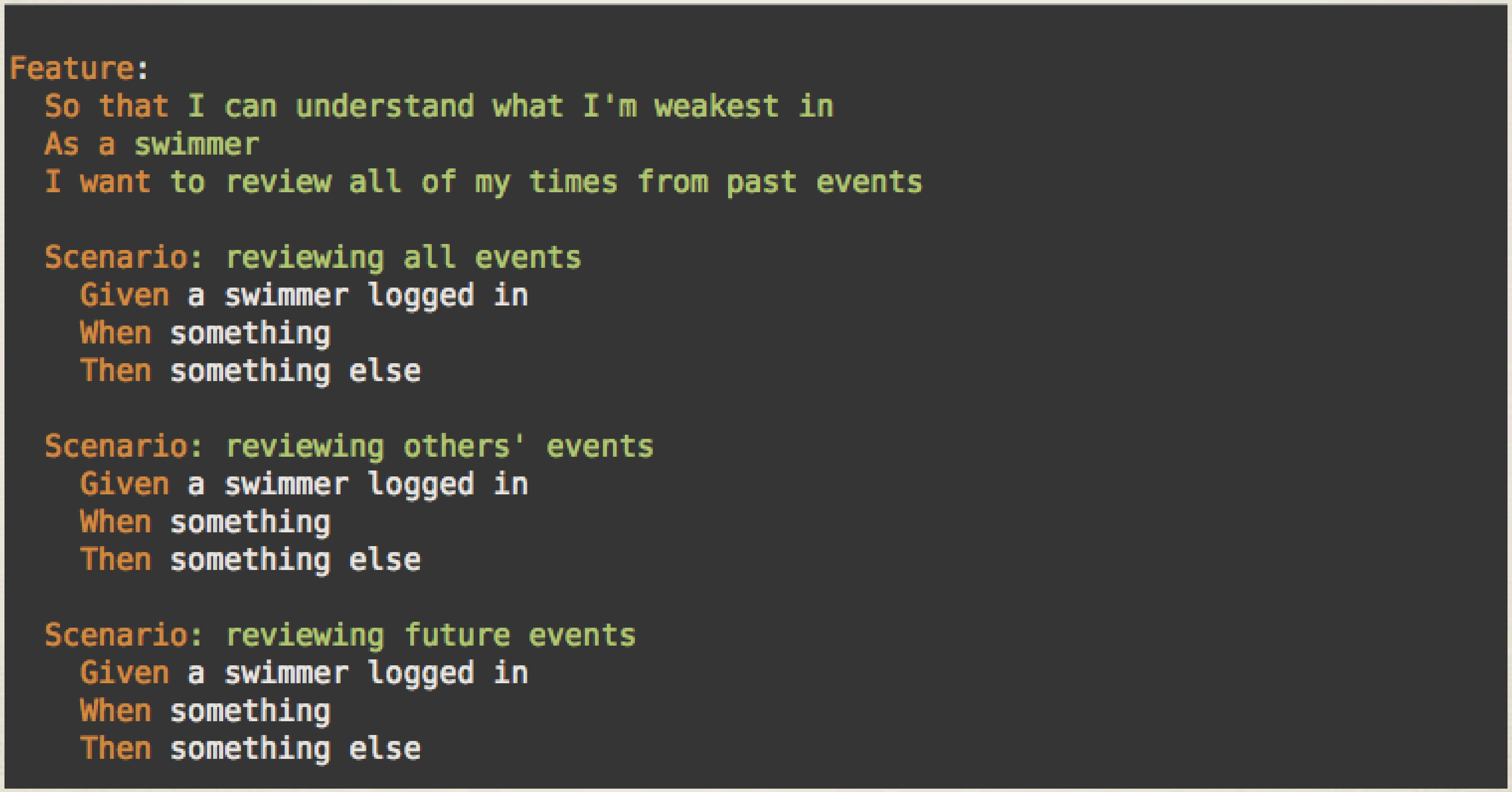
Backgrounds



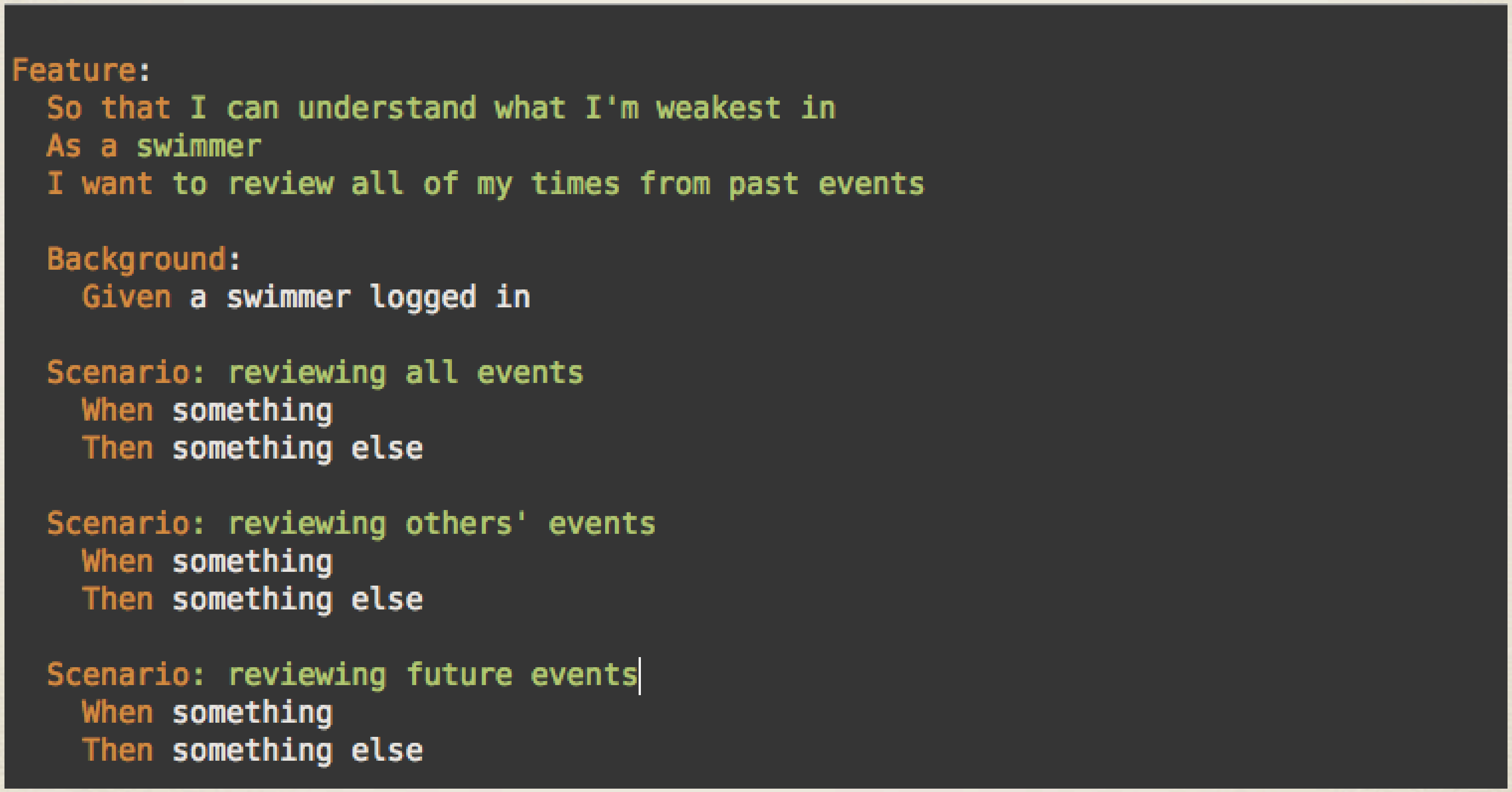
```
Feature:
  So that I can understand what I'm weakest in
  As a swimmer
  I want to review all of my times from past events

  Scenario: reviewing all events
    Given a swimmer logged in
    When something
    Then something else

  Scenario: reviewing others' events
    Given a swimmer logged in
    When something
    Then something else

  Scenario: reviewing future events
    Given a swimmer logged in
    When something
    Then something else
```

Backgrounds



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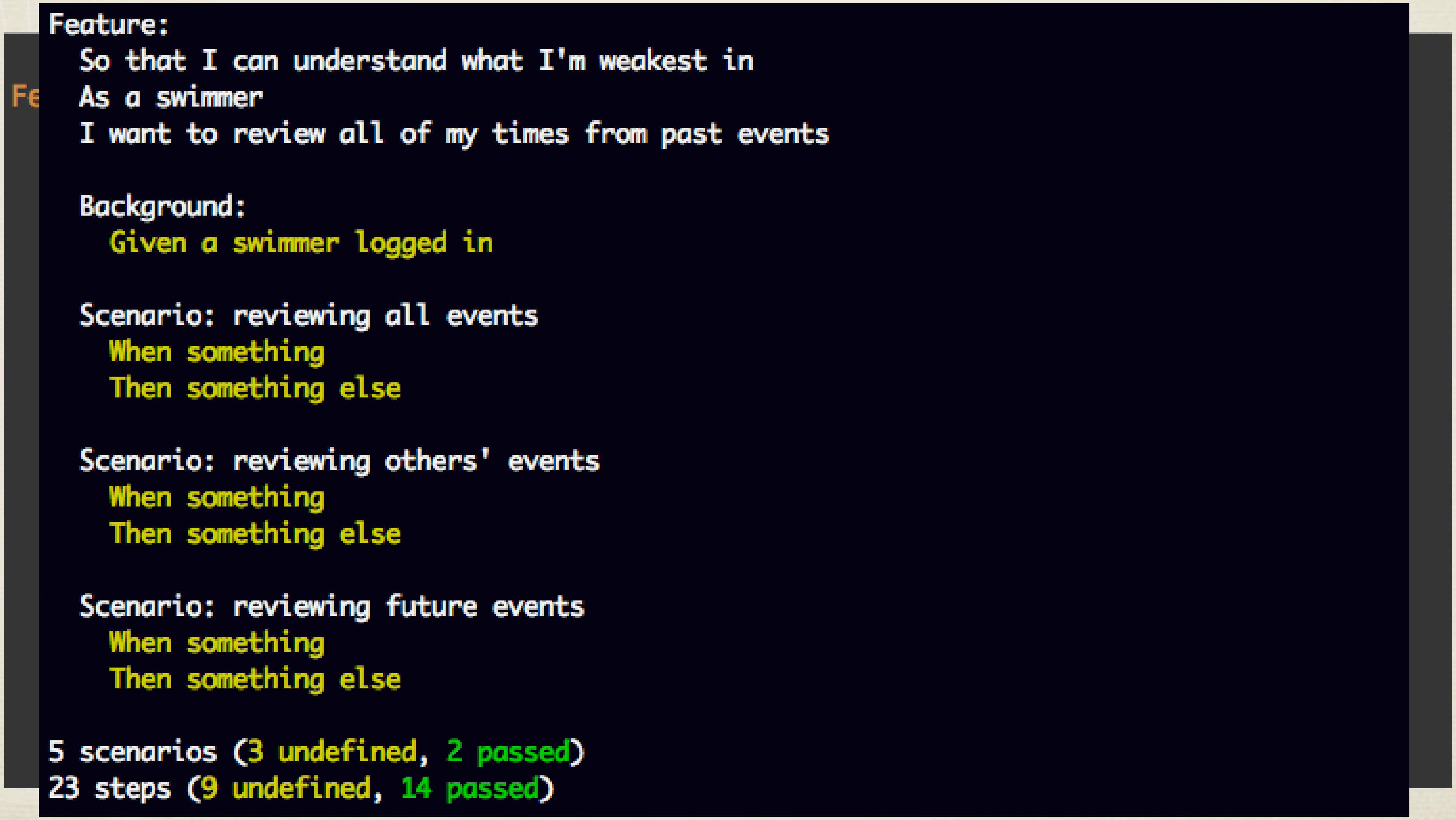

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5 scenarios (3 undefined, 2 passed)
23 steps (9 undefined, 14 passed)
```
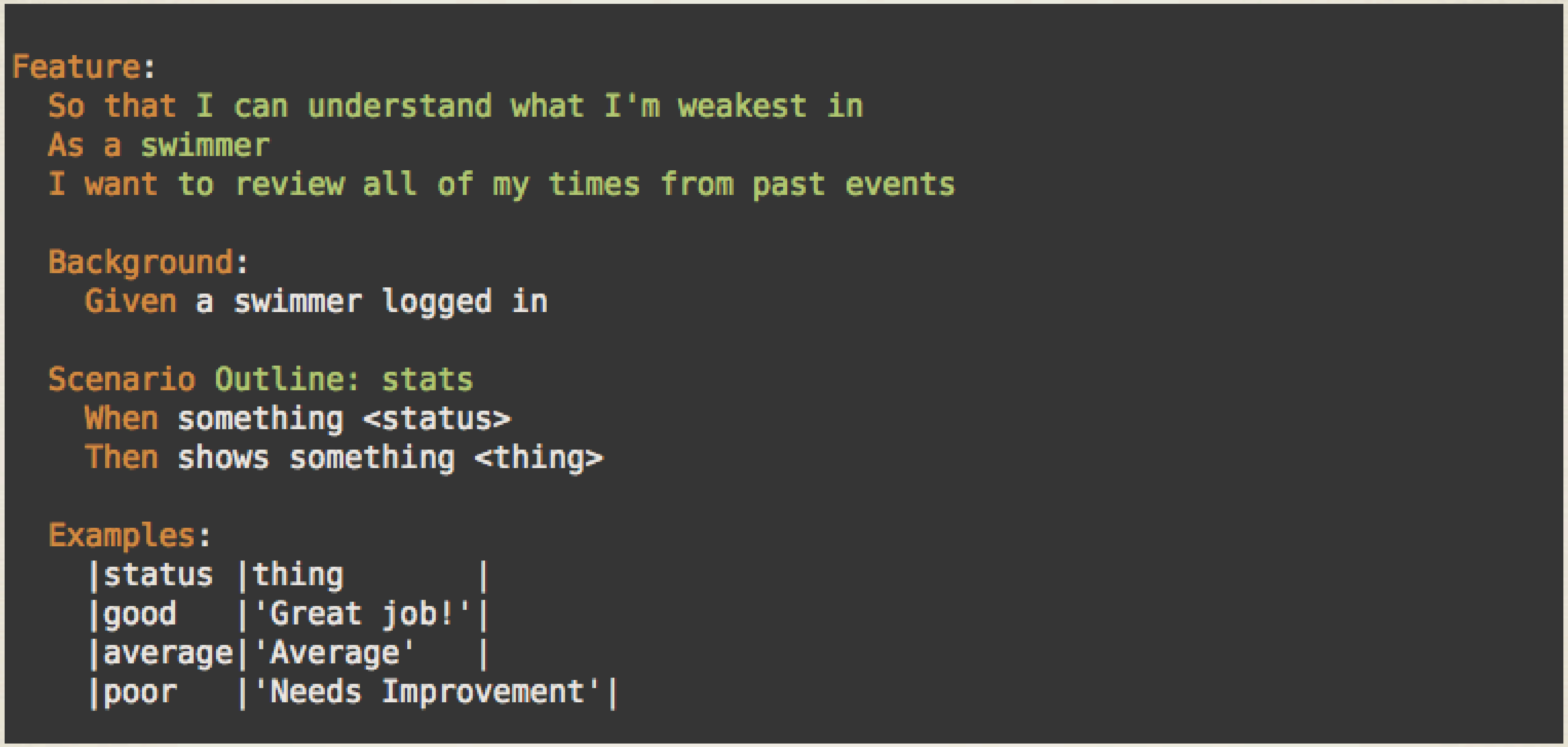

Scenario Outlines



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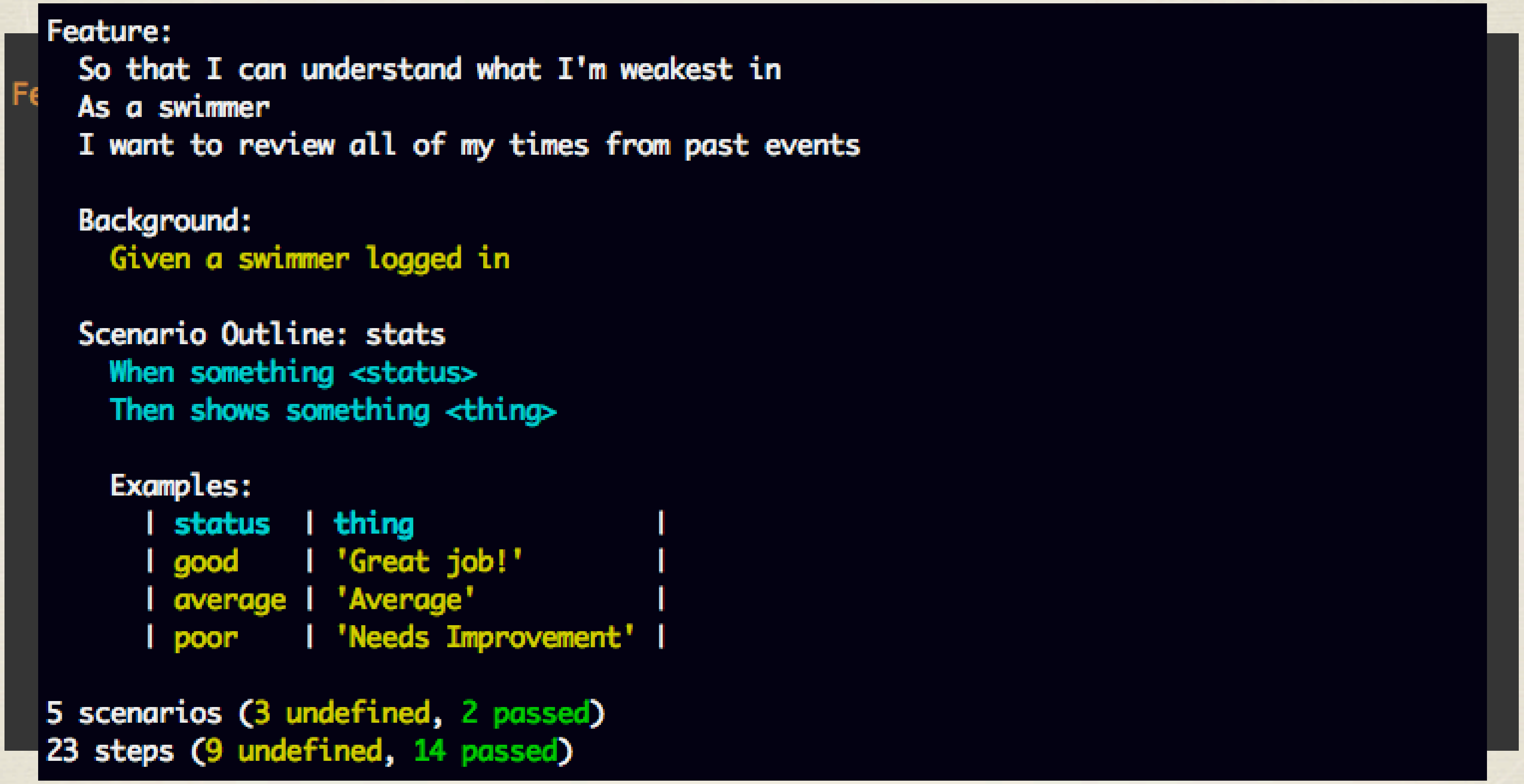
Feature:
  So that I can understand what I'm weakest in
  As a swimmer
  I want to review all of my times from past events

  Background:
    Given a swimmer logged in

  Scenario Outline: stats
    When something <status>
    Then shows something <thing>

  Examples:
    |status |thing       |
    |good   |'Great job!'|
    |average|'Average'   |
    |poor   |'Needs Improvement'|
```

Scenario Outlines



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    Examples:
      | status  | thing               |
      | good    | 'Great job!'        |
      | average | 'Average'           |
      | poor    | 'Needs Improvement' |

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```

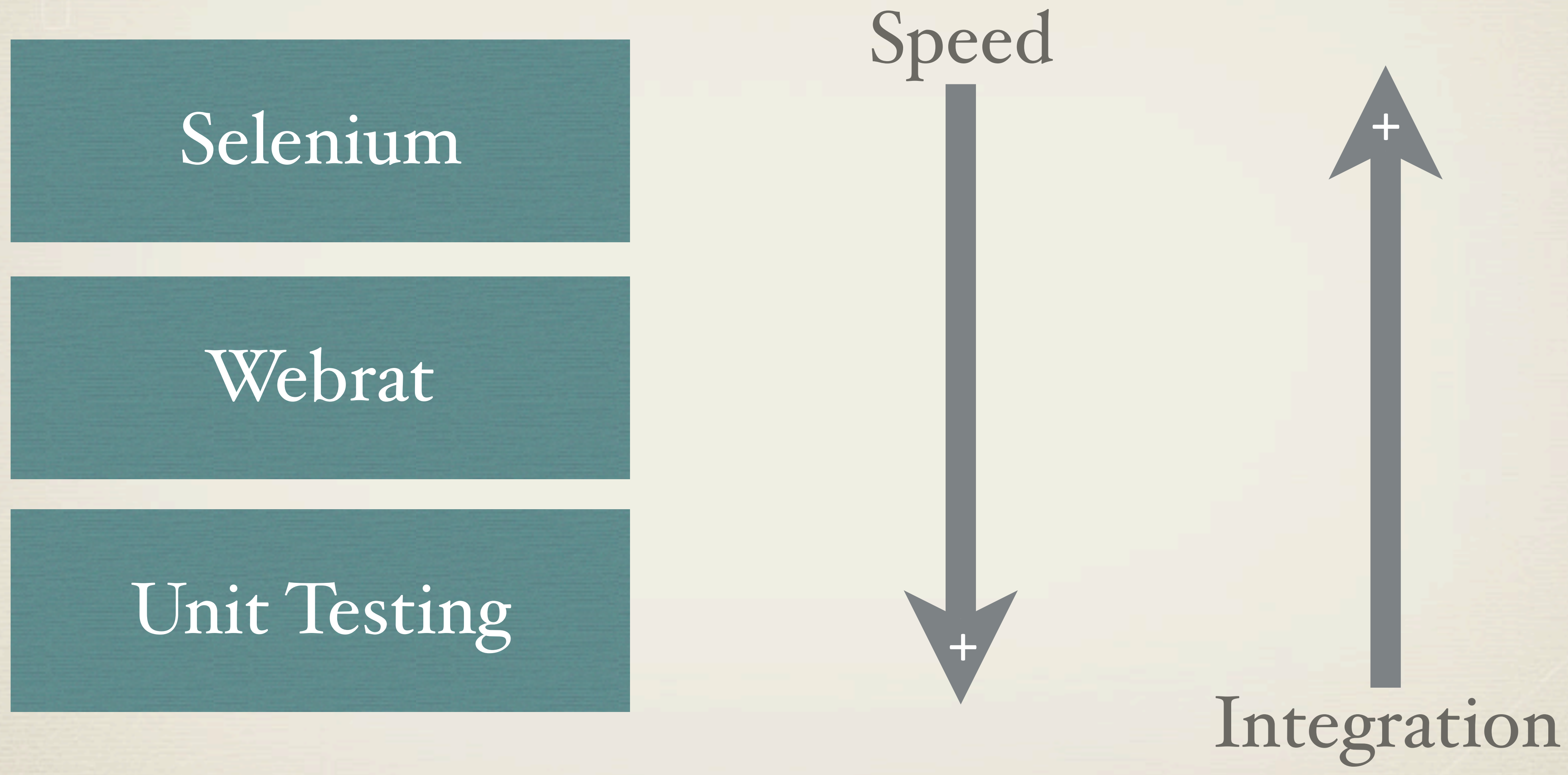
Remember...

- **Cucumber** defines the ***features*** you wish you had.
- **RSpec** (or **Test::Unit**) defines the ***interactions*** and ***objects*** you wish you had.
- You're building a business domain language!

A Good Investment

- Conversation
- Acceptance Criteria
- Design
- Documentation
- Automated Functional and Integration Tests

What do I use?



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- Relying too much on state in your step-definitions
- Tests with no user value
- Too much concrete, less abstract

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```
Given /^state$/ do
  @article = Article.create!
end
Given /^coupled by state/ do
  @article.title = ‘Bad’
end
```

Cucumber Smells

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- Too much concrete, less abstract

```
Given /^check the db/ do
  Article.find(1).should_not == nil
end
```

Cucumber Smells

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```
Given I go to the login page
And I fill in “username” with “john”
And I fill in “password” with “testpass”
And I click “login”
```

Cucumber Smells

- Relying too much on state in your step-definitions
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```
Given I'm logged in
```

Cucumber Smells

- Relying too much on state in your step-definitions
- Tests with no user value
- Too much concrete, less abstract

```
Given /I am logged in/ do
  @user = User.create!(:login => ‘john’,
                       :password => ‘testpass’)
  And ‘I fill in “username” with “john”’
  And ‘I fill in “password” with “testpass”’
  And ‘I click “login”’
end
```

Additional Resources / Topics

- http://cukes.info
- The RSpec Book (beta @ PragProg.com)
- Textmate Bundles are available!

- Extending Cucumber with World
- Using Hooks (careful they’re global)