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Software Engineering 2 (SWT2)

Chapter 2:

Introduction into Ruby on Rails

Agenda

2

- **Ruby & Ruby on Rails**
 - What is Ruby on Rails?
 - A few words about Ruby
 - Rails' core components
 - RESTful architecture
 - Your first Rails application
- Your introductory Rails exercise
- What else do you need to know?
- Additional Literature

What is Ruby on Rails

3

- Web application development framework
- Written in Ruby
- Rails philosophy
 - “Don’t repeat yourself” – DRY
 - Convention over Configuration – there is “the Rails way”
 - RESTful architecture
- MVC architecture
- Rails 1: 2005
- Rails 2: 2007
- Rails 3: 2010 (requires at least Ruby > 1.8.7 p249 or >= 1.9.2)
- <http://rubyonrails.org/>

Rails Core Components

4

- Action Pack
 - Action Controller
 - Action Dispatch
 - Action View
- Active Model
 - Active Record
 - Data Mapper
- Action Mailer
- Active Resource
- Active Support

A few words about Ruby

5

- Dynamic
- Open-source
- Object-oriented
- Dynamic type system
- Automatic memory management
- Ruby 1.0: 1996
- Ruby 1.8.7 >p249: 2010
- Ruby 1.9.2: Aug 2010
- <http://www.ruby-lang.org/>

RESTful Architecture

6

- Representational State Transfer (REST) is a software architecture style for distributed systems
- Clients and servers
 - Client sends request to server
 - Server processes request
 - Server sends response
- Central principle: resource-orientation
- Largest RESTful implementation: World Wide Web

RESTful Architecture

7

- REST leverages all 4 HTTP 1.1 verbs: GET, PUT, POST, DELETE
- Differentiation of collections and individual elements

Resource	GET	PUT	POST	DELETE
Single element http://localhost:3000/authors/1	Retrieve	Update or create	Create	Delete
Collection http://localhost:3000/authors	List	Replace	Create	Delete

Examples of Routes

8

- GET / → invoke “home” controller
- GET /authors → retrieve a list of all authors
- GET /authors/new → get the form to enter a new author
- POST /authors → create a new author
- GET /authors/1 → show details of the first author
- GET /authors/1/edit → get the form to edit the first author
- PUT /authors/1 → update the first author
- DELETE /authors/1 → delete the first author

Your first Rails Application

9

```
JM:lecture_02 juergen$ ruby --version  
ruby 1.8.7 (2010-06-23 patchlevel 299) [i686-darwin10]
```

```
JM:lecture_02 juergen$ rails --version  
Rails 3.0.0
```

```
JM:lecture_02 juergen$ rails  
Usage:  
  rails new APP_PATH [options]
```

Description:

The 'rails new' command creates a new Rails application with a default directory structure and configuration at the path you specify.

Example:

```
rails new ~/Code/Ruby/weblog
```

This generates a skeletal Rails installation in ~/Code/Ruby/weblog. See the README in the newly created application to get going.

Your first Rails Application

10

```
JM:lecture_02 juergen$ rails new
my_first_rails_app
  create
  create  README
  create  Rakefile
  create  config.ru
  create  .gitignore
  create  Gemfile
  create  app
  create  app/controllers/
application_controller.rb
  create  app/helpers/application_helper.rb
  create  app/views/layouts/
application.html.erb
  create  app/mailers
  create  app/models
  create  config
  create  config/routes.rb
  create  config/application.rb
  create  config/environment.rb
  create  config/environments
  create  config/environments/development.rb
  create  config/environments/production.rb
  create  config/environments/test.rb
  create  config/initializers
  create  config/initializers/
backtrace_silencers.rb
  create  config/initializers/inflections.rb
  create  config/initializers/mime_types.rb
  create  config/initializers/
secret_token.rb
  create  config/initializers/
session_store.rb
  create  config/locales
  create  config/locales/en.yml
  create  config/boot.rb
  create  config/database.yml
  create  db
  create  db/seeds.rb
  create  doc
  create  doc/README_FOR_APP
  create  lib
  create  lib/tasks
  create  lib/tasks/.gitkeep
```

Your first Rails Application

11

```
create log
create log/server.log
create log/production.log
create log/development.log
create log/test.log
create public
create public/404.html
create public/422.html
create public/500.html
create public/favicon.ico
create public/index.html
create public/robots.txt
create public/images
create public/images/rails.png
create public/stylesheets
create public/stylesheets/.gitkeep
create public/javascripts
create public/javascripts/application.js
create public/javascripts/controls.js
create public/javascripts/dragdrop.js
create public/javascripts/effects.js
create public/javascripts/prototype.js
create public/javascripts/rails.js
create script
create script/rails
create test
create test/performance/browsing_test.rb
create test/test_helper.rb
create test/fixtures
create test/functional
create test/integration
create test/unit
create tmp
create tmp/sessions
create tmp/sockets
create tmp/cache
create tmp/pids
create vendor/plugins
create vendor/plugins/.gitkeep
```

Your first Rails Application

12

```
JM:my_first_rails_app juergen$ cd my_first_rails_app/  
JM:my_first_rails_app juergen$ rails
```

```
Could not find gem 'sqlite3-ruby (>= 0, runtime)' in any of  
the gem sources.
```

```
Try running `bundle install`.
```

Your first Rails Application

13

```
JM:my_first_rails_app juergen$  
  bundle install
```

```
Fetching source index for  
http://rubygems.org/
```

```
Using rake (0.8.7)  
Using abstract (1.0.0)  
Using activesupport (3.0.0)  
Using builder (2.1.2)  
Using i18n (0.4.1)  
Using activemodel (3.0.0)  
Using erubis (2.6.6)  
Using rack (1.2.1)  
Using rack-mount (0.6.13)  
Using rack-test (0.5.6)  
Using tzinfo (0.3.23)  
Using actionpack (3.0.0)
```

```
Using mime-types (1.16)  
Using polyglot (0.3.1)  
Using treetop (1.4.8)  
Using mail (2.2.7)  
Using actionmailer (3.0.0)  
Using arel (1.0.1)  
Using activerecord (3.0.0)  
Using activeresource (3.0.0)  
Using bundler (1.0.2)  
Using thor (0.14.3)  
Using railties (3.0.0)  
Using rails (3.0.0)  
Installing sqlite3-ruby (1.3.1) with  
native extensions
```

```
Your bundle is complete! Use `bundle  
show [gemname]` to see where a bundled  
gem is installed.
```

Your first Rails Application

14

```
JM:my_first_rails_app juergen$ rails
```

```
Usage: rails COMMAND [ARGS]
```

The most common rails commands are:

```
generate      Generate new code (short-cut alias: "g")
```

```
console       Start the Rails console (short-cut alias: "c")
```

```
server        Start the Rails server (short-cut alias: "s")
```

```
dbconsole     Start a console for the database specified in config/  
database.yml (short-cut alias: "db")
```

```
new           Create a new Rails application. "rails new my_app" creates  
a new application called MyApp in "./my_app"
```

```
[...]
```

All commands can be run with `-h` for more information.

Your first Rails Application

15

```
JM:my_first_rails_app juergen$ rails s -h
```

```
Usage: rails server [mongrel, thin, etc] [options]
```

```
-p, --port=port           Runs Rails on the specified port.  
                          Default: 3000  
  
-b, --binding=ip         Binds Rails to the specified ip.  
                          Default: 0.0.0.0  
  
-c, --config=file        Use custom rackup configuration file  
-d, --daemon              Make server run as a Daemon.  
-u, --debugger           Enable ruby-debugging for the server.  
-e, --environment=name   Specifies the environment to run this  
                          server under (test/development/production).  
                          Default: development  
-P, --pid=pid            Specifies the PID file.  
                          Default: tmp/pids/server.pid  
  
-h, --help               Show this help message.
```

Your first Rails Application

16

```
JM:my_first_rails_app juergen$ rails s
```

```
=> Booting WEBrick
```

```
=> Rails 3.0.0 application starting in development on  
http://0.0.0.0:3000
```

```
=> Call with -d to detach
```

```
=> Ctrl-C to shutdown server
```

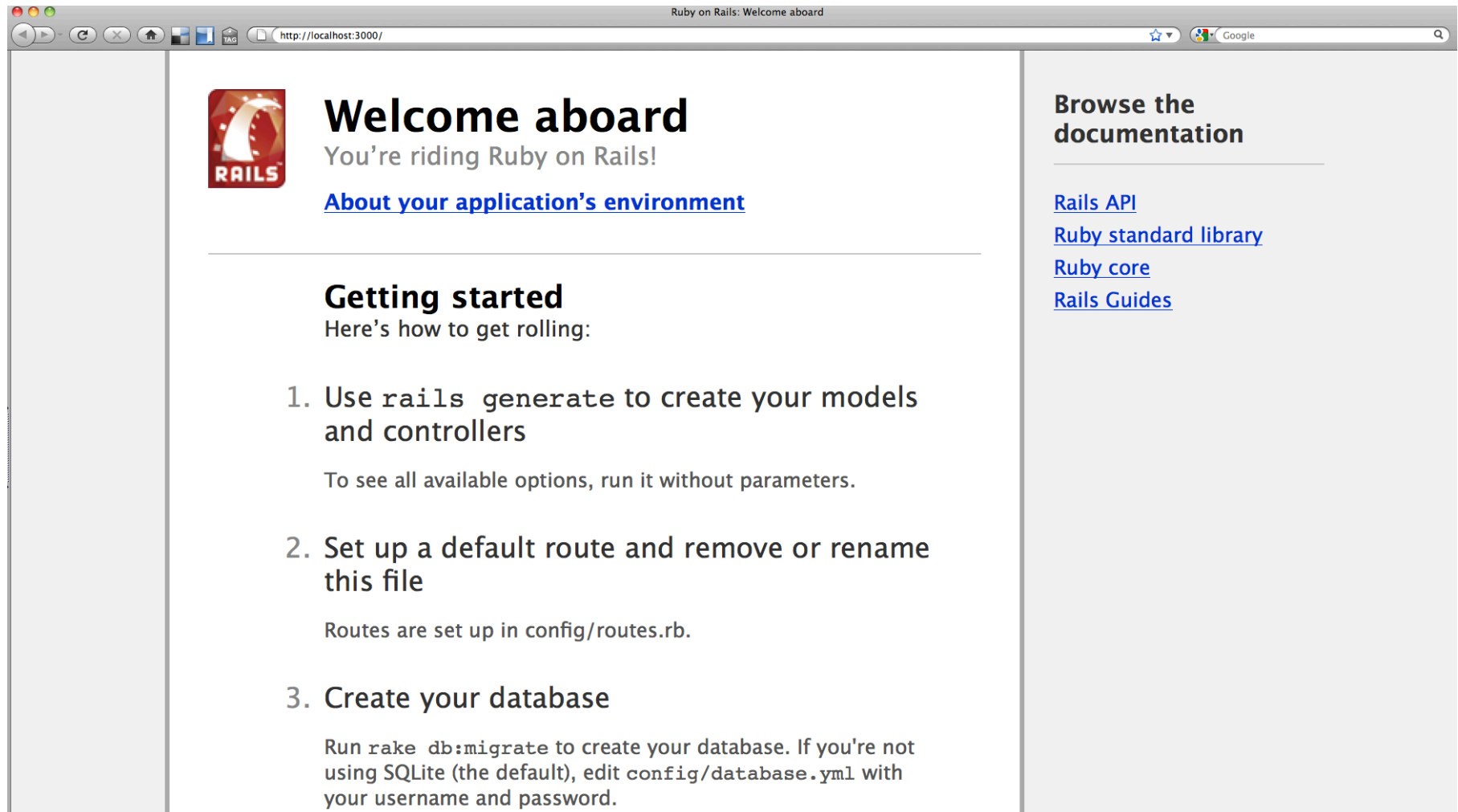
```
[2010-10-14 18:17:21] INFO WEBrick 1.3.1
```

```
[2010-10-14 18:17:21] INFO ruby 1.8.7 (2010-06-23) [i686-  
darwin10]
```

```
[2010-10-14 18:17:21] INFO WEBrick::HTTPServer#start:  
pid=37145 port=3000
```


Your first Rails Application


17



Ruby on Rails: Welcome aboard

http://localhost:3000/

Google



Welcome aboard

You're riding Ruby on Rails!

[About your application's environment](#)

Getting started

Here's how to get rolling:

1. Use `rails generate` to create your models and controllers
To see all available options, run it without parameters.
2. Set up a default route and remove or rename this file
Routes are set up in `config/routes.rb`.
3. Create your database
Run `rake db:migrate` to create your database. If you're not using SQLite (the default), edit `config/database.yml` with your username and password.

Browse the documentation

- [Rails API](#)
- [Ruby standard library](#)
- [Ruby core](#)
- [Rails Guides](#)

Your first Rails Application

18

```
JM:my_first_rails_app juergen$ rails g -h
```

```
Usage: rails generate GENERATOR [args] [options]
```

```
Please choose a generator below.
```

```
Rails:
```

```
  controller
```

```
  generator
```

```
  helper
```

```
  integration_test
```

```
  mailer
```

```
  migration
```

```
  model
```

```
  observer
```

```
  performance_test
```

```
  resource
```

```
  scaffold
```

```
  scaffold_controller
```

```
  [...]
```

Your first Rails Application

19

```
JM:my_first_rails_app juergen$ rails g controller -h
```

Usage:

```
rails generate controller NAME [action action] [options]
```

Runtime options:

```
-p, [--pretend] # Run but do not make any changes
```

Description:

Stubs out a new controller and its views.

Pass the controller name, either

CamelCased or under_scored, and a list of views as arguments.

This generates a controller class in app/controllers and invokes helper, template engine and test framework generators.

Your first Rails Application

20

```
JM:my_first_rails_app juergen$ rails g controller home index
  create  app/controllers/home_controller.rb
  route   get "home/index"
  invoke  erb
  create  app/views/home
  create  app/views/home/index.html.erb
  invoke  test_unit
  create  test/functional/home_controller_test.rb
  invoke  helper
  create  app/helpers/home_helper.rb
  invoke  test_unit
  create  test/unit/helpers/home_helper_test.rb
```

Your first Rails Application

21

```
JM:my_first_rails_app juergen$ rm public/index.html
```

```
JM:my_first_rails_app juergen$ mate app/views/home/index.html.erb
```

```

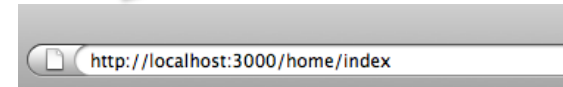
x index.html.erb
1 <h1>Home#index</h1>
2 <p>Hello World!</p>

```



Routing Error

No route matches "/"



Home#index

Hello World!

Adjusting Rails Routes

22

- Requests \leftrightarrow controllers and controller actions
- Domain-specific language
- `config/routes.rb`

```
MyFirstRailsApp::Application.routes.draw do
  get "home/index"

  # The priority is based upon order of creation

  # resource route maps HTTP verbs to controller actions automatically:
  # resources :products
  [...]
  # You can have the root of your site routed with "root"
  # root :to => "welcome#index"

  # See how all your routes lay out with "rake routes"
end
```

Adjusting Rails Routes

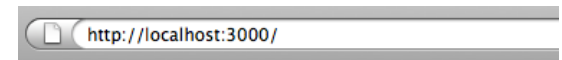
23

```
1. JM:my_first_rails_app juergen$ rake routes
home_index
  GET /home/index(:format)
  :action=>"index", :controller=>"home"}
```

2. Change # root :to => "welcome#index" → **root :to => "home#index"**

```
3. JM:my_first_rails_app juergen$ rake routes
home_index
  GET /home/index(:format)
  :action=>"index", :controller=>"home"}
```

```
root
  /(:format)
  {:action=>"index", :controller=>"home"}
```

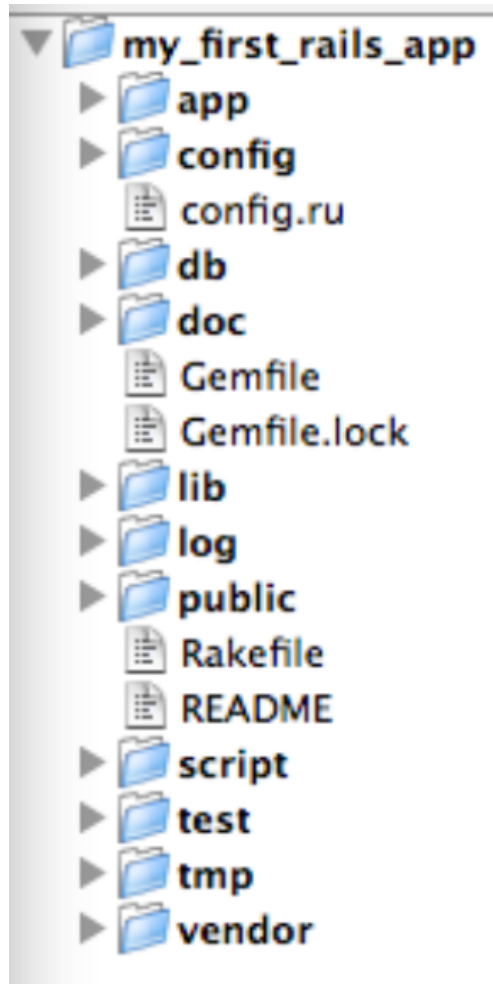


Home#index

Hello World!

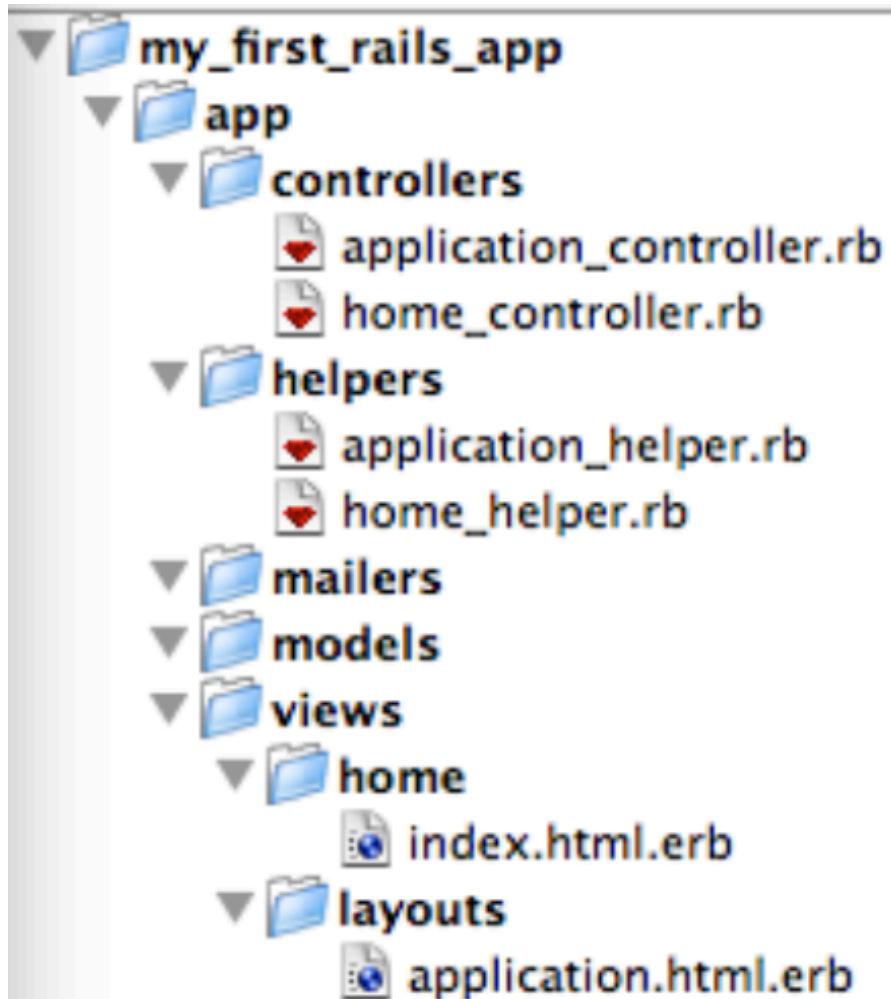
Application Layout

24



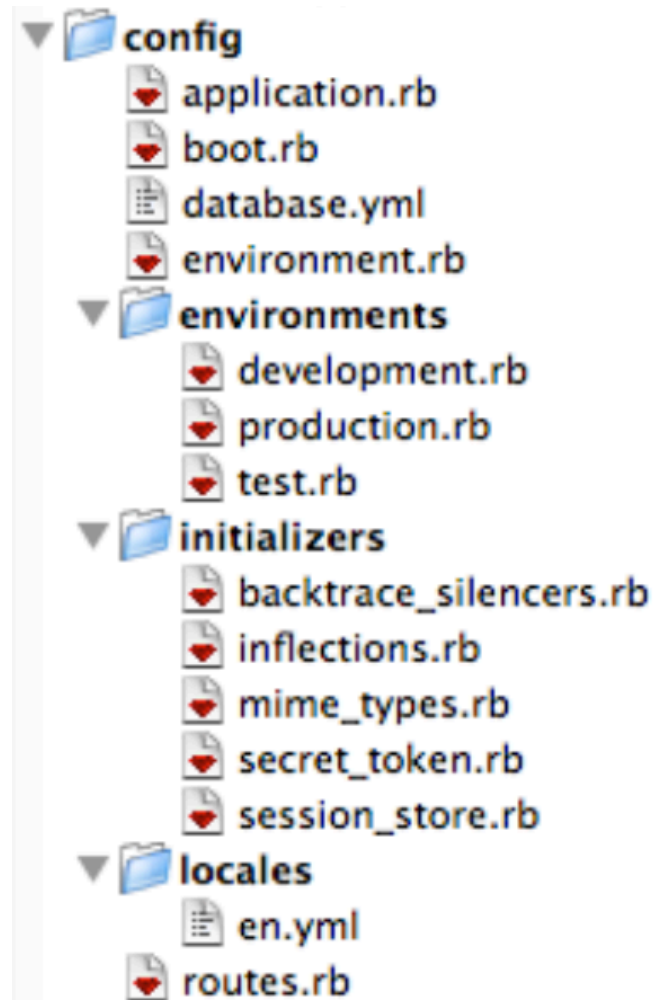
Application Layout

25



Application Layout

26



Visiting the Source Code

27

routes.rb

```
1 MyFirstRailsApp::Application.routes.draw do
2   get "home/index"
3
4   root :to => "home#index"
5 end
```

* application_controller.rb

```
1 class ApplicationController < ActionController::Base
2   protect_from_forgery
3 end
```

* home_controller.rb

```
1 class HomeController < ApplicationController
2   def index
3   end
4
5 end
```

Visiting the Source Code

28

```
* application.html.erb
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>MyFirstRailsApp</title>
5   <%= stylesheet_link_tag :all %>
6   <%= javascript_include_tag :defaults %>
7   <%= csrf_meta_tag %>
8 </head>
9 <body>
10
11 <%= yield %>
12
13 </body>
14 </html>
```

```
* index.html.erb
1 <h1>Home#index</h1>
2 <p>Hello World!</p>
```

Summary

29

What did we do?

- Created a Rails application
- Started the Rails app
- Generated a controller with an action
- “Hello World” in a view
- Adjusted routes
- Understood the Rails application layout
- Reviewed the source code

Agenda

30

- Ruby & Ruby on Rails
- **Your introductory Rails exercise**
 - Exercise outline
 - Grading
 - How to start?
 - Rails installation and prerequisites
 - A quick introduction into Git
 - Git clone & Go
 - Dependency management with Bundler
 - Behaviour-driven development and Cucumber in a nutshell
 - Running common tasks with Rake
 - Implementing the “Add Authors” feature
- What else do you need to know?
- Additional Literature

Exercise outline

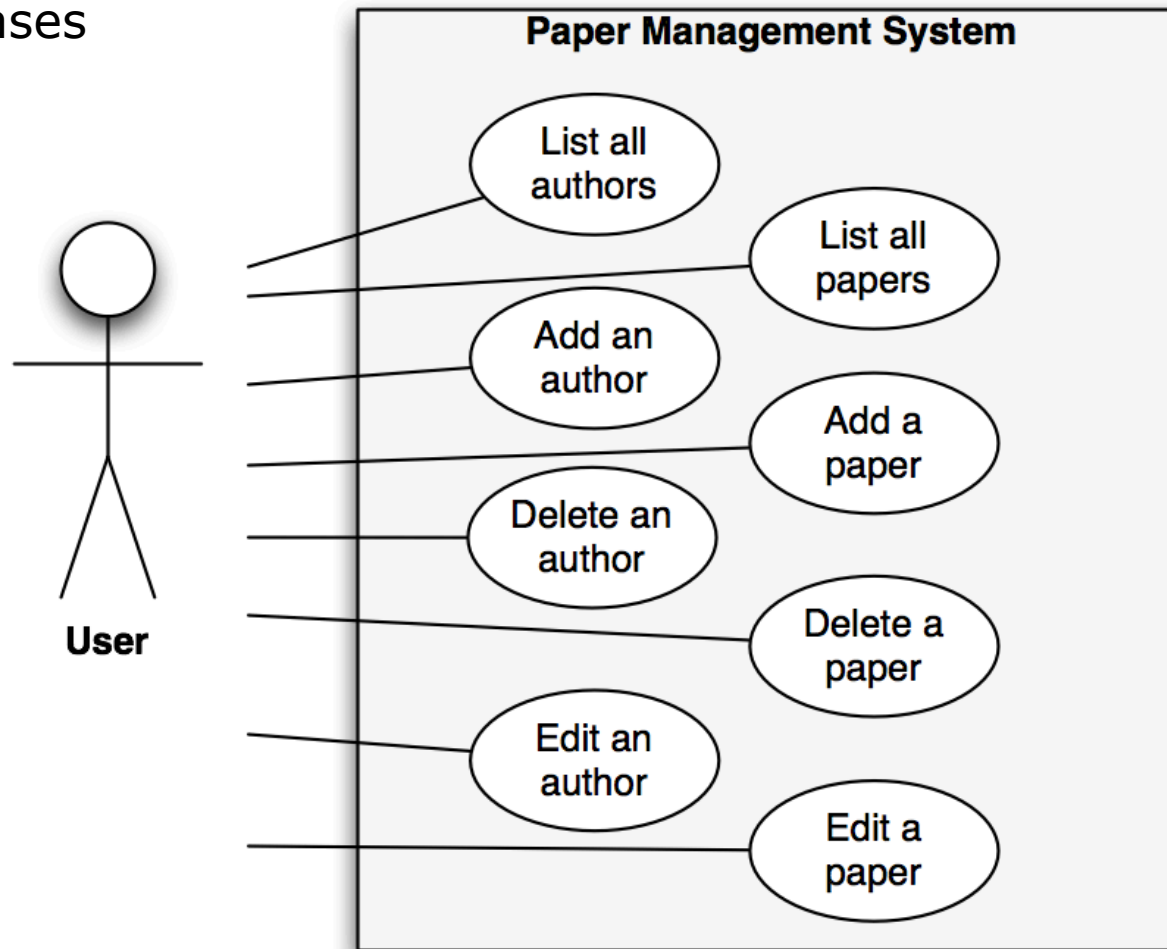
31

- Goal: Get familiar with Ruby on Rails
- Task
 - Web-based paper management system
 - Author
 - ◇ First name
 - ◇ Last name
 - ◇ Homepage
 - Paper
 - ◇ Name
 - ◇ Publication
 - ◇ Year
 - A paper has many authors (max. 10)
 - An author has many papers
- We prepared a Rails application for you

Exercise outline

32

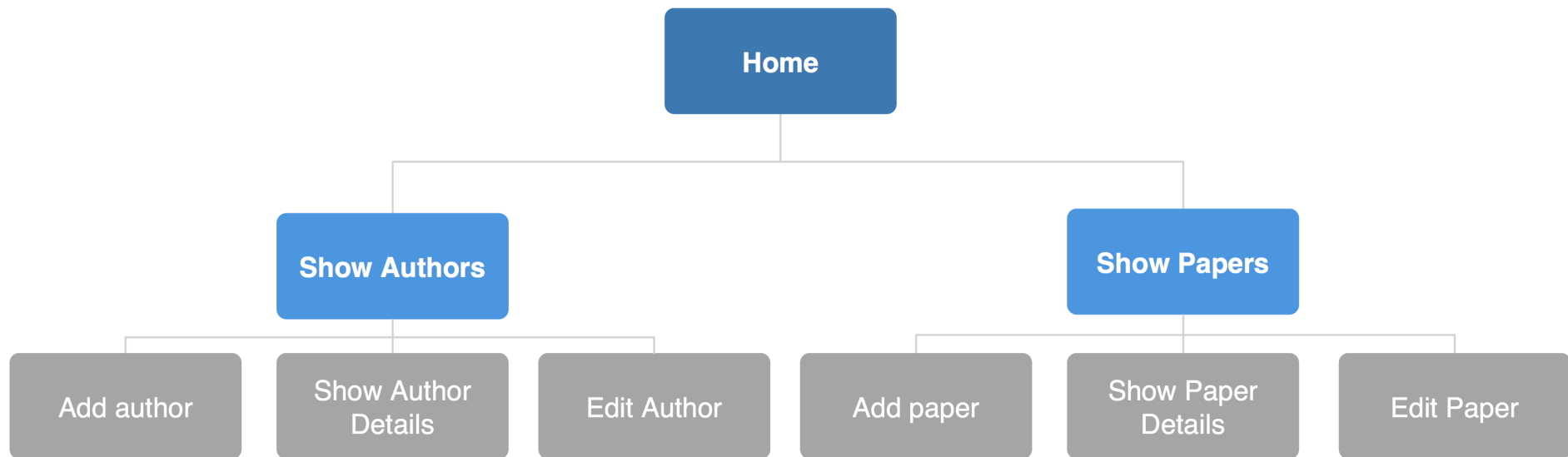
Use Cases



Exercise outline

33

Expected Sitemap



Exercise outline

34

Mockups:

<https://gomockingbird.com/mockingbird/index.html?project=v890g6l>

Paper Management System

[Show papers](#)

[Show authors](#)

Listing authors

Name	Homepage	
Hasso Plattner	http://www.hpi.uni-potsdam.de/personen/stifter.html	Edit Delete

[Add author](#) | [Back](#)

Editing author

First name

Last name

Homepage

[Show](#) | [Back](#)

First name: Hasso

Last name: Plattner

Homepage: <http://www.hpi.uni-potsdam.de/personen/stifter.html>

Papers:

[This is a paper](#)

[Edit](#) | [Back](#)

Grading

35

- 10% of your total mark depends on this exercise
- We have a 19 feature tests that will evaluate your implementation (I will show how later)
- Each of you owns a Git branch (we will cover Git later)
- Commit after each finished feature
- Deadline (firm): Nov 5, 10:00am

Passing Features	Grade unless PO?	Grade if PO
0-4	5,0	5,0
5	4,0	4,0
6	4,0	3,7
7	3,7	3,3
8	3,3	3,0
9	3,0	2,7
10	3,0	2,3
11-12	2,7	2,0
13	2,3	1,7
14	2,0	1,3
15-16	1,7	1,0
17	1,3	1,0
18-19	1,0	1,0

How to start?

36

- Option 1: you use Mac or Linux and use Ruby on Rails on your OS
- Option 2: you have Windows or want to use a VM
 - We prepared one for you
 - `smb://fs3/bbs/studentenaustauschordner` (only from internal HPI network or via VPN)
- Option 3: you have Windows and install Ruby on Rails on your OS (probably the worst option)
- VMWare Player is installed in pool rooms in the old main building

Rails installation and prerequisites

37

- Ruby on Rails, MySQL etc. are installed and configured in the VM
- Otherwise: <http://wiki.rubyonrails.org/getting-started/installation>
 - Mac
 - Windows
 - Linux
- You already have Ruby installed and need the old version?
 - Use a Ruby version manager
 - Mac/Linux → RVM: <http://rvm.beginrescueend.com/>
 - Windows → PIK: <http://github.com/vertiginous/pik> (not tested)

Git Installation

38

- How to install Git:
 - apt-get install git-core
 - <http://git-scm.com/> (Installers for all systems)
- Setting up user name and email
 - Mandatory to commit changes
 - Please use your HPI email address

```
$> git config --global user.email "name@student.hpi-uni-potsdam.de"  
$> git config --global user.name "Max Mustermann"
```

- Alternative: setting parameters only for one project:

```
$> cd /path/to/your/project  
$> git config user.email "name@student.hpi-uni-potsdam.de"  
$> git config user.name "Max Mustermann"
```

A quick introduction into Git

39

- Distributed versioning system

```
JM:lecture_02 juergen$ git -help
```

The most commonly used git commands are:

add	Add file contents to the index
branch	List, create, or delete branches
checkout	Checkout a branch or paths to the working tree
clone	Clone a repository into a new directory
commit	Record changes to the repository
[...]	
pull	Fetch from & merge with another repo or a local branch
push	Update remote refs along with associated objects
rm	Remove files from the working tree and from the index

See 'git help COMMAND' for more information on a specific command.

Git clone & Go

40

```
JM:lecture_02 juergen$ git clone  
swt2_10_exercise@svn.hpi.uni-  
potsdam.de:swt2_10_exercise.git
```

```
Cloning into swt2_10_exercise...
```

```
remote: Counting objects: 581, done.
```

```
remote: Compressing objects: 100% (367/367), done.
```

```
remote: Total 581 (delta 333), reused 280 (delta 195)
```

```
Receiving objects: 100% (581/581), 142.41 KiB, done.
```

```
Resolving deltas: 100% (333/333), done.
```

```
JM:lecture_02 juergen$ cd swt2_10_exercise/
```


Git clone & Go

41

```
JM:swt2_10_exercise juergen$
```

```
git checkout --track -b vorname.nachname origin/  
vorname.nachname
```

```
Branch juergen.mueller set up to track remote branch  
juergen.mueller from origin.
```

```
Switched to a new branch 'juergen.mueller'
```

```
JM:swt2_10_exercise juergen$ git pull
```

```
Already up-to-date.
```

```
JM:swt2_10_exercise juergen$ cp config/database.yml.default config/  
database.yml
```

```
JM:swt2_10_exercise juergen$ mate .
```

Dependency management with Bundler

42

```

* Gemfile
1 source 'http://rubygems.org'~
2 ~
3 RAILS_VERSION = '~> 3.0.0'~
4 DM_VERSION    = '~> 1.0.2'~
5 ~
6 gem 'activerecord', RAILS_VERSION, :require => 'active_support'~
7 gem 'actionpack',   RAILS_VERSION, :require => 'action_pack'~
8 gem 'actionmailer', RAILS_VERSION, :require => 'action_mailer'~
9 gem 'railties',     RAILS_VERSION, :require => 'rails'~
10 ~
11 gem 'dm-rails',      '~> 1.0.3'~
12 gem 'dm-mysql-adapter', DM_VERSION~
13 gem 'dm-migrations',  DM_VERSION~
14 gem 'dm-types',       DM_VERSION~
15 gem 'dm-validations', DM_VERSION~
16 gem 'dm-constraints', DM_VERSION~
17 gem 'dm-transactions', DM_VERSION~
18 gem 'dm-aggregates',  DM_VERSION~
19 gem 'dm-timestamps',  DM_VERSION~
20 gem 'dm-observer',    DM_VERSION~
21 ~
22 group(:development, :test) do~
23   gem 'capybara'~
24   gem 'database_cleaner'~
25   gem 'cucumber-rails'~
26   gem 'cucumber'~
27   gem 'rspec-rails', '~> 2.0.0.beta.19'~
28   gem 'spork'~
29   gem 'launchy'~
30 end~

```

Dependency management with Bundler

43

```
JM:swt2_10_exercise juergen$
```

```
bundle install
```

```
Using rake (0.8.7)
Using activesupport (3.0.0)
Using activemodel (3.0.0)
Using actionpack (3.0.0)
Using mail (2.2.7)
Using actionmailer (3.0.0)
Using nokogiri (1.4.3.1)
Using selenium-webdriver (0.0.28)
Using capybara (0.3.9)
Using json (1.4.6)
Using cucumber (0.9.2)
Using cucumber-rails (0.3.2)
Using dm-core (1.0.2)
Using dm-active_model (1.0.2)
Using dm-aggregates (1.0.2)
Using dm-migrations (1.0.2)
Using dm-constraints (1.0.2)
```

```
Using dm-do-adapter (1.0.2)
Using do_mysql (0.10.2)
Using dm-mysql-adapter (1.0.2)
Using dm-observer (1.0.2)
Using dm-rails (1.0.3)
Using dm-timestamps (1.0.2)
Using dm-transactions (1.0.2)
Using dm-types (1.0.2)
Using dm-validations (1.0.2)
Using rspec-core (2.0.0.rc)
Using rspec-expectations (2.0.0.rc)
Using rspec-mocks (2.0.0.rc)
Using rspec (2.0.0.rc)
Using rspec-rails (2.0.0.rc)
Using bundler (1.0.2)
[...]
Your bundle is complete! Use `bundle show
[gemname]` to see where a bundled gem is
installed.
```

Behaviour-driven Development and Cucumber in a Nutshell

44

- Behaviour-driven development (BDD)
- Write test cases in a domain-specific language
- Readable for non-programmers
- Story-based definition of application behaviour
- Definition of features (feature injection)
- Driven by business value (outside-in)

Behaviour-driven Development and Cucumber in a Nutshell

45

- An example using Cucumber

Scenario: Add a simple author

Given I am on the authors page

When I follow "Add author"

And I fill in the example author

And I press "Add"

Then there should be the example author

And I should be on the authors page

Behaviour-driven Development and Cucumber in a Nutshell

46

- Given – When – Then
- Features are located in `features/*.feature`
- Each line is a “step” that is implemented in Ruby (Capybara)
- Steps are located in `features/step_definitions/`
- Interpreted via regular expressions

<http://github.com/jnicklas/capybara>

> Given I am on the authors page

```
Given /^I am on (.+)$/ do |page_name|  
  visit path_to(page_name)  
end
```

<http://www.rubular.com>

Behaviour-driven Development and Cucumber in a Nutshell

47

```
> When I follow "Add author"
```

```
When /^I follow "([\^"]*)"??$/ do |link|  
  click_link(link)  
end
```

```
> And I fill in the example author
```

```
When /^I fill in the example author$/ do  
  When "I fill in the following:", example_authors()[0]  
end
```

```
When /^I fill in the following:$/ do |fields|
```

```
  fields.rows_hash.each do |name, value|  
    When %{I fill in "#{name}" with "#{value}"}  
  end  
end
```

Behaviour-driven Development and Cucumber in a Nutshell

48

> And I press "Add"

```
When /^I press "([^"]*)"??$/ do |button|
  click_button(button)
end
```

> Then there should be the example author

```
Then /^there should be a(?:n)? "([^"]*)" with the following:$/ do |model, table|
  old_path = current_path
  Given %{I am on the #{model.pluralize} page}
  When %{I follow "#{get_name(model, table)}"}
  Then %{I should see the following:}, table
  visit old_path # make sure we go back where we started
end
```

> And I should be on the authors page

```
Then /^I should be on (.+)\$/ do |page_name|
  current_path = URI.parse(current_url).path
  current_path.should == path_to(page_name)
end
```


Running common tasks with Rake

49

```
JM:swt2_10_exercise juergen$ rake -T
```

```
rake cucumber:all # Run all features
```

```
rake db:automigrate # Perform destructive automigration in  
the current Rails.env
```

```
rake db:autoupgrade # Perform non destructive automigration  
in the current Rails.env
```

```
rake db:create:all # Create all the local databases defined  
in config/database.yml
```

```
[...]
```

Run all Features

50

```
JM:swt2_10_exercise juergen$ rake cucumber:all
```

```
F-----FF-----FF----FF---FF-----FF-----FF-----FF-----FF-----FF-----  
FF-----FF-----FF-----F
```

```
(::) failed steps (::)
```

```
Can't find mapping from "authors" to a path.
```

```
Now, go and add a mapping in /Users/juergen/HPI/teaching/2010_WS_SWT2/git/slides/  
lecture_02/swt2_10_exercise/features/support/paths.rb (RuntimeError)
```

```
./features/support/paths.rb:27:in `path_to'
```

```
./features/step_definitions/web_steps.rb:20:in `/^(?:|I )am on (.+)$/'
```

```
features/add_author.feature:10:in `Given I am on authors'
```

```
[...]
```

```
Failing Scenarios:
```

```
cucumber features/add_author.feature:9 # Scenario: Add a simple author
```

```
[...]
```

```
13 scenarios (13 failed), 78 steps (78 skipped), 0m0.189s
```

Feature "Add author"

51

Feature: Add author

Scenario: Add a simple author

Given I am on authors

When I follow "Add author"

And I fill in the example author

And I press "add"

Then there should be the example author

And I should be on authors

Run a single Feature

52

```
JM:swt2_10_exercise juergen$ cucumber features/add_author.feature
```

```
F-----
```

Can't find mapping from "authors" to a path.

Now, go and add a mapping in /Users/juergen/HPI/teaching/2010_WS_SWT2/git/slides/lecture_02/swt2_10_exercise/features/support/paths.rb

(RuntimeError)

```
./features/support/paths.rb:27:in `path_to'
```

```
./features/step_definitions/web_steps.rb:20:in `/^(?:|I )am on (.+)$/'
```

```
features/add_author.feature:10:in `Given I am on authors'
```

Failing Scenarios:

```
cucumber features/add_author.feature:9 # Scenario: Add a simple author
```

```
1 scenario (1 failed)
```

```
6 steps (1 failed, 5 skipped)
```

```
0m0.012s
```

Register our Routes

53

```

1 Exercise::Application.routes.draw do
2   # The priority is based upon order of creation:
3   # first created -> highest priority.
4   -
5   # Sample of regular route:
6   # match 'products/:id' => 'catalog#view'
7   # Keep in mind you can assign values other than :controller and
  . :action
8   -
9   # Sample of named route:
10  # match 'products/:id/purchase' => 'catalog#purchase', :as =>
  . :purchase
11  # This route can be invoked with purchase_url(:id => product.id)
12  -
13  # Sample resource route (maps HTTP verbs to controller actions
  . automatically):
14  # resources :products
15  -
16  resources :authors
17  -

```

Run the Feature again → fail

54

```
JM:swt2_10_exercise juergen$ cucumber features/add_author.feature
```

```
F-----
```

```
(::) failed steps (::)
```

```
uninitialized constant AuthorsController  
(ActionController::RoutingError)
```

```
./features/step_definitions/web_steps.rb:20:in `/^(?:|I )am on (.+)$/ '  
features/add_author.feature:10:in `Given I am on the authors page'
```

```
Failing Scenarios:
```

```
cucumber features/add_author.feature:9 # Scenario: Add a simple author
```

```
1 scenario (1 failed)
```

```
6 steps (1 failed, 5 skipped)
```

```
0m0.017s
```

Rails Generators

55

```
JM:swt2_10_exercise juergen$ rails g -h
```

```
Usage: rails generate GENERATOR [args] [options]
```

General options:

```
-p, [--pretend] # Run but do not make any changes
```

Please choose a generator below.

Rails:

```
controller
```

```
generator
```

```
model
```

```
performance_test
```

```
resource
```

```
scaffold
```

```
scaffold_controller
```

A kick-start leveraging scaffolding

56

```
JM:swt2_10_exercise juergen$ rails g scaffold -h
```

Usage:

```
rails generate scaffold NAME [field:type field:type] [options]
```

ScaffoldController options:

```
  [--helper]                # Indicates when to generate helper, Default: true
```

Rspec options:

```
  [--fixture]               # Indicates when to generate fixture
  [--routing-specs]         # Generate routing specs, Default: true
  [--controller-specs]     # Generate controller specs, Default: true
  [--view-specs]           # Generate view specs, Default: true
  [--helper-specs]         # Generate helper specs, Default: true
```

■ Author

- First name
- Last name
- Homepage

A kick-start leveraging scaffolding

57

```
JM:swt2_10_exercise juergen$ rails g scaffold author first_name:String  
last_name:String homepage:String --routing-specs false --controller-specs  
false --view-specs false --helper-specs false --request-specs false
```

```
invoke data_mapper → create    app/models/author.rb  
invoke  rspec → create        spec/models/author_spec.rb  
route   resources :authors  
invoke  scaffold_controller  
create  app/controllers/authors_controller.rb  
invoke  erb  
create  app/views/authors  
create  app/views/authors/index.html.erb  
create  app/views/authors/edit.html.erb  
create  app/views/authors/show.html.erb  
create  app/views/authors/new.html.erb  
create  app/views/authors/_form.html.erb  
invoke  helper → create       app/helpers/authors_helper.rb  
invoke  stylesheets → create   public/stylesheets/scaffold.css
```

Setting up the Database

58

```
JM:swt2_10_exercise juergen$ rake -T db:
```

```
rake db:automigrate # Perform destructive automigration of  
all repositories in the current Rails.env
```

```
rake db:autoupgrade # Perform non destructive automigration  
of all repositories in the current Rails.env
```

```
rake db:create # Create the database(s) defined in config/  
database.yml for the current Rails.env - also creates the  
test database(s) if Rails.env.development?
```

```
JM:swt2_10_exercise juergen$ rake db:autoupgrade
```

```
[datamapper] Finished auto_upgrade! for :default repository  
'swt2_exercise_dev'
```

Setting up the Database

59

```
JM:swt2_10_exercise juergen$ rails db
```

```
mysql> use swt2_exercise_dev;
```

```
Database changed
```

```
mysql> show tables;
```

```
+-----+
| Tables_in_swt2_exercise_dev |
+-----+
| authors                      |
+-----+
```

```
mysql> DESCRIBE authors;
```

Field	Type	Null	Key	Default	Extra
id	int(10) unsigned	NO	PRI	NULL	auto_increment
first_name	varchar(50)	YES		NULL	
last_name	varchar(50)	YES		NULL	
homepage	varchar(50)	YES		NULL	

First Step is Implemented!

60

```
JM:swt2_10_exercise juergen$ rake db:autoupgrade RAILS_ENV=test

[datamapper] Finished auto_upgrade! for :default repository 'swt2_exercise_test'

JM:swt2_10_exercise juergen$ cucumber features/add_author.feature

• F----

(::) failed steps (::)
no link with title, id or text 'Add author' found (Capybara::ElementNotFound)
./features/step_definitions/web_steps.rb:35
./features/step_definitions/web_steps.rb:14:in `with_scope'
./features/step_definitions/web_steps.rb:34:in `/^(?:|I )follow "([^"]*)"(?: within "([^"]*)" )?$/ '
features/add_author.feature:11:in `When I follow "Add author"'

Failing Scenarios:
cucumber features/add_author.feature:9 # Scenario: Add a simple author

1 scenario (1 failed), 6 steps (1 failed, 4 skipped, 1 passed), 0m0.142s
```

Adjust a View to Satisfy the Test

61



- Adjust `app/view/authors/index.html.erb#27` to
- `<%= link_to 'Add author', new_author_path %>`

Next Steps are Implemented!

62

```
JM:swt2_10_exercise juergen$ cucumber features/add_author.feature
```

```
. . . F--
```

```
(::) failed steps (::)
```

```
no button with value or id or text 'Save' found (Capybara::ElementNotFound)
```

```
./features/step_definitions/web_steps.rb:29
```

```
./features/step_definitions/web_steps.rb:14:in `with_scope'
```

```
./features/step_definitions/web_steps.rb:28:in `/^(?:|I )press "([^"]*)"(:  
within "([^"]*)"?)?$/'
```

```
features/add_author.feature:13:in `And I press "add"'
```

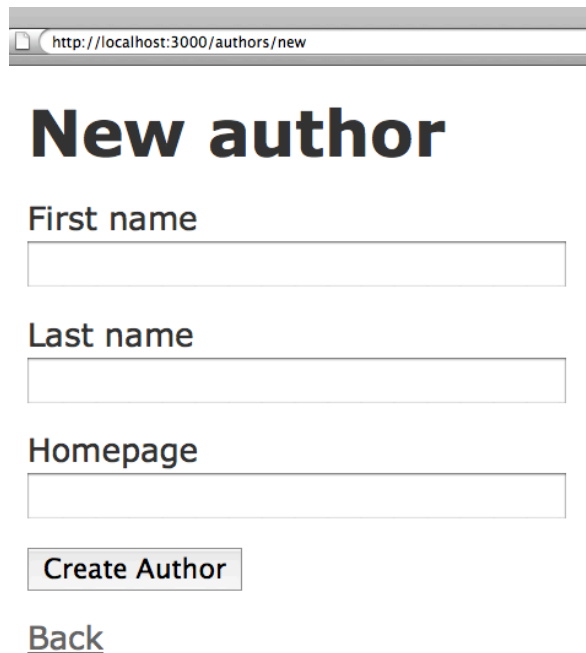
Failing Scenarios:

```
cucumber features/add_author.feature:9 # Scenario: Add a simple author
```

```
1 scenario (1 failed), 6 steps (1 failed, 2 skipped, 3 passed), 0m0.132s
```

Adjust the Form Partial

63



http://localhost:3000/authors/new

New author

First name

Last name

Homepage

[Back](#)

- Adjust `app/view/authors/_form.html.erb#27` to
- `<%= f.submit 'Save' %>`

4 Steps are green!

64

```
JM:swt2_10_exercise juergen$ cucumber features/add_author.feature
. . . . F-

(::) failed steps (::)

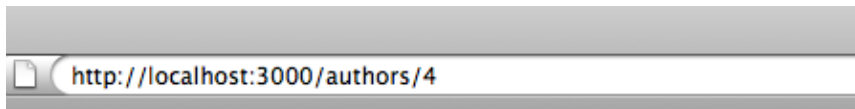
expected: "/authors",
      got: "/authors/1" (using ==)
(RSpec::Expectations::ExpectationNotMetError)
./features/step_definitions/web_steps.rb:198:in `/^(?:|I )should be on (.+)
$/'
features/add_author.feature:14:in `Then I should be on the authors page'

Failing Scenarios:
cucumber features/add_author.feature:9 # Scenario: Add a simple author

1 scenario (1 failed)
6 steps (1 failed, 1 skipped, 4 passed)
0m0.158s
```


Adjust Redirection

65



Author was successfully created.

First name: Ruby

Last name: on

Homepage: Rails

[Edit](#) | [Back](#)

- Adjust `app/controllers/authors_controller#47` to
- ```
format.html {
 redirect_to :action =>
 'index'
}
```

# Only one more Step to do :-)

66

```
JM:swt2_10_exercise juergen$ cucumber features/add_author.feature
```

```
.F
```

```
(::) failed steps (::)
```

```
no link with title, id or text 'Alan Turing' found
(Capybara::ElementNotFound)
```

```
./features/step_definitions/web_steps.rb:35
```

```
./features/step_definitions/web_steps.rb:14:in `with_scope'
```

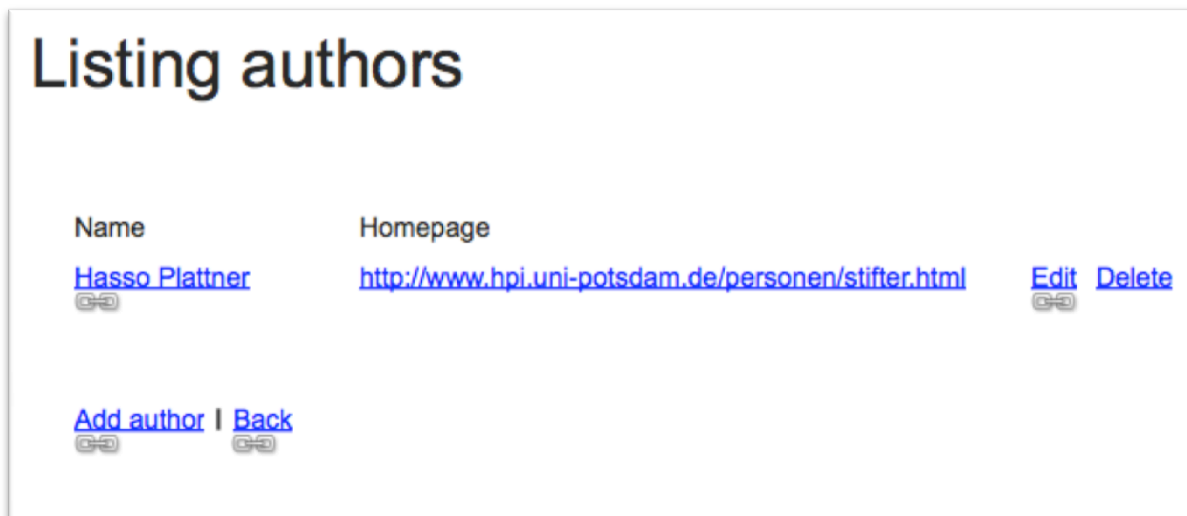
```
./features/step_definitions/web_steps.rb:34:in `/^(?:|I)follow "([^\"]
)"(?: within "([^\"])")?$/'
```

```
features/add_author.feature:15:in `And there should be the example
author'
```

```
1 scenario (1 failed), 6 steps (1 failed, 5 passed), 0m0.212s
```

# Insert a Link on authors#index

67



- Adjust `app/views/authors/index.html.erb`
- First name + Last name → Name
- `<%=`  
`link_to`  
`"#{author.first_name} #{author.last_name}",`  
`author`  
`%>`

ALL STEPS ARE GREEN →  
FEATURE IS RUNNING!

68

```
JM:swt2_10_exercise juergen$ cucumber features/
add_author.feature
```

```
.....
```

```
1 scenario (1 passed)
```

```
6 steps (6 passed)
```

```
0m0.212s
```

# Our Implementation of "add\_authors"

69

http://localhost:3000/authors

## Listing authors

| Name                          | Homepage                  |                      |                      |                         |
|-------------------------------|---------------------------|----------------------|----------------------|-------------------------|
| <a href="#">Test Toast</a>    | http://www.test-toast.com | <a href="#">Show</a> | <a href="#">Edit</a> | <a href="#">Destroy</a> |
| <a href="#">Ruby on Rails</a> |                           | <a href="#">Show</a> | <a href="#">Edit</a> | <a href="#">Destroy</a> |

[Add author](#)

http://localhost:3000/authors/new

## New author

First name

Last name

Homepage

[Back](#)

http://localhost:3000/authors

## Listing authors

| Name                               | Homepage                  |                      |                      |                         |
|------------------------------------|---------------------------|----------------------|----------------------|-------------------------|
| <a href="#">Test Toast</a>         | http://www.test-toast.com | <a href="#">Show</a> | <a href="#">Edit</a> | <a href="#">Destroy</a> |
| <a href="#">Ruby on Rails</a>      |                           | <a href="#">Show</a> | <a href="#">Edit</a> | <a href="#">Destroy</a> |
| <a href="#">First Feature Done</a> |                           | <a href="#">Show</a> | <a href="#">Edit</a> | <a href="#">Destroy</a> |

[Add author](#)

## Publishing our Feature

70

```
JM:swt2_10_exercise juergen$ git status
On branch juergen.mueller2
Changed but not updated:
(use "git add <file>..." to update what will be committed)
(use "git checkout -- <file>..." to discard changes in working directory)
#
modified: config/routes.rb
#
Untracked files:
(use "git add <file>..." to include in what will be committed)
#
app/controllers/authors_controller.rb
app/helpers/authors_helper.rb
app/models/
app/views/authors/
public/stylesheets/scaffold.css
spec/models/
no changes added to commit (use "git add" and/or "git commit -a")
```

# Publishing our Feature

71

```
JM:swt2_10_exercise juergen$ git add *
JM:swt2_10_exercise juergen$ git status
Changes to be committed:
new file: app/controllers/authors_controller.rb
new file: app/helpers/authors_helper.rb
new file: app/models/author.rb
new file: app/views/authors/_form.html.erb
new file: app/views/authors/edit.html.erb
new file: app/views/authors/index.html.erb
new file: app/views/authors/new.html.erb
new file: app/views/authors/show.html.erb
modified: config/routes.rb
modified: features/add_author.feature
modified: features/step_definitions/standard_entries.rb
new file: public/stylesheets/scaffold.css
new file: spec/models/author_spec.rb
```

## Publishing our Feature

72

```
JM:swt2_10_exercise juergen$ git commit -m "implemented the feature 'add_author'"
[juergen.mueller2 e4cbaa4] implemented the feature 'add_author'
```

```
13 files changed, 431 insertions(+), 144 deletions(-)
create mode 100644 app/controllers/authors_controller.rb
create mode 100644 app/helpers/authors_helper.rb
create mode 100644 app/models/author.rb
create mode 100644 app/views/authors/_form.html.erb
create mode 100644 app/views/authors/edit.html.erb
create mode 100644 app/views/authors/index.html.erb
create mode 100644 app/views/authors/new.html.erb
create mode 100644 app/views/authors/show.html.erb
create mode 100644 public/stylesheets/scaffold.css
create mode 100644 spec/models/author_spec.rb
```

```
JM:swt2_10_exercise juergen$ git status
On branch juergen.mueller2
Your branch is ahead of 'origin/juergen.mueller2' by 1 commit.
```



# Publishing our Feature

73

```
JM:swt2_10_exercise juergen$ git push
```

```
Counting objects: 45, done.
```

```
Delta compression using up to 2 threads.
```

```
Compressing objects: 100% (27/27), done.
```

```
Writing objects: 100% (30/30), 576.96 KiB, done.
```

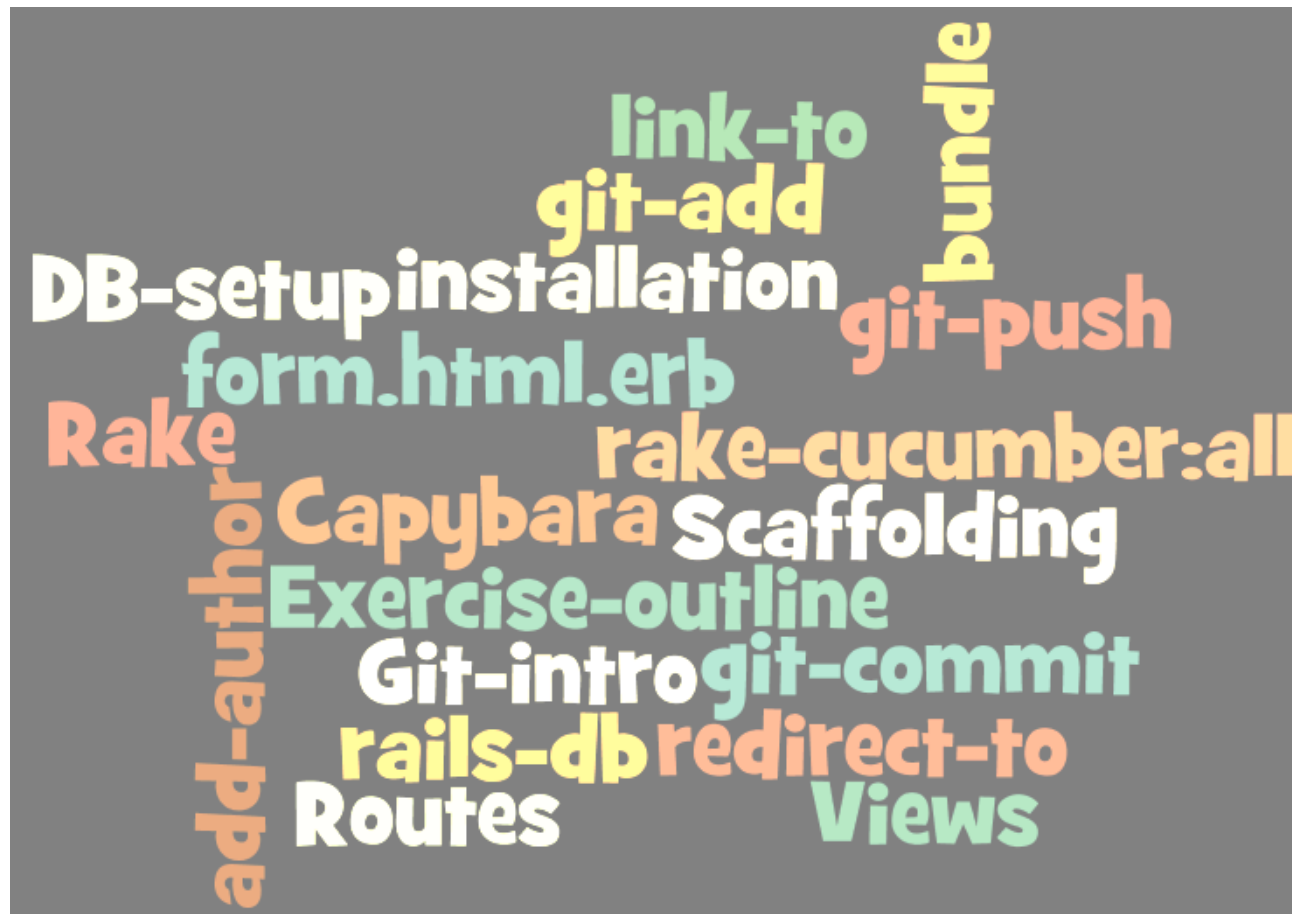
```
Total 30 (delta 6), reused 6 (delta 0)
```

```
To swt2_10_exercise@svn.hpi.uni-potsdam.de:swt2_10_exercise.git
d14e137..e4cbaa4 juergen.mueller2 -> juergen.mueller2
```

# Summary

74

What did we learn?



# Agenda

75

- Ruby & Ruby on Rails
- Your introductory Rails exercise
- **What else do you need to know?**
  - DataMapper
  - Resources to help yourself
  - Let's get it started
- Documentation and Additional Literature

# DataMapper

76

- Data types
  - String
  - Date
- Associations

| ActiveRecord                                             | DataMapper                                           |
|----------------------------------------------------------|------------------------------------------------------|
| <code>has_many</code>                                    | <code>has n</code>                                   |
| <code>has_one</code>                                     | <code>has 1</code>                                   |
| <code>belongs_to</code>                                  | <code>belongs_to</code>                              |
| <code>has_and_belongs_to_many :model</code>              | <code>has n, :things, :through =&gt; Resource</code> |
| <code>has_many :association, :through =&gt; Model</code> | <code>has n, :things, :through =&gt; :model</code>   |

- Constraints: <http://github.com/datamapper/dm-constraints>
- N:M relationships: <http://rdoc.info/github/datamapper/dm-core/master/DataMapper/Associations/ManyToMany/Collection>

# Resources to help yourself

77

Directly related to the exercise

- <http://rubyonrails.org>
- <http://www.ruby-lang.org>
- [http://guides.rubyonrails.org/getting\\_started.html](http://guides.rubyonrails.org/getting_started.html)
- <smb://fs3/bbs/studentenaustauschordner>
- <http://www.vmware.com/de/products/player/>
- <http://wiki.rubyonrails.org/getting-started/installation>
- <http://rvm.beginrescueend.com/>, <http://github.com/vertiginous/pik>
- <http://git-scm.com/>
- <http://cukes.info/>
- <http://github.com/brynary/webrat/wiki>
- <http://github.com/jnicklas/capybara>
- <http://www.rubular.com/>
- <http://datamapper.org/docs/>
- [http://guides.rubyonrails.org/form\\_helpers.html](http://guides.rubyonrails.org/form_helpers.html)
- <http://github.com/datamapper/dm-constraints>
- <http://rdoc.info/github/datamapper/dm-core/master/DataMapper/Associations/ManyToMany/Collection>

# Let's get it started

78

1. Access to the Git repository
2. Send PO names to [swt2\\_2010\\_orga@hpi.uni-potsdam.de](mailto:swt2_2010_orga@hpi.uni-potsdam.de) until Tuesday
3. Check mailing list mal
4. POs
  - meet with Stephan next week,
  - receive information about user research and
  - model use cases and processes
5. Problems?
  - Ask your colleagues: [swt2\\_2010@hpi.uni-potsdam.de](mailto:swt2_2010@hpi.uni-potsdam.de)
  - Mail us: [swt2\\_2010\\_orga@hpi.uni-potsdam.de](mailto:swt2_2010_orga@hpi.uni-potsdam.de)
6. Implement feature after feature (commit/push)
7. Finish the exercise until Nov 5, 10:00am

# Documentation and Additional Literature

79

- <http://rubyonrails.org/documentation> (API, Guides, ...)
- <http://beta.gotapi.com/>
- <http://www.ruby-doc.org/>
- Agile Web Development with Rails (4th edition)

# Outlook

80

- CRM
- Requirements → Software architecture
- Infrastructure (Agilo, mailing lists, continuous integration, ...)
- Software configuration management



Thank you for  
your attention!