

## Software Engineering 2 (SWT2)

Chapter 2:  
Introduction into Ruby on Rails

# Agenda

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- **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

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- 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

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

# A few words about Ruby

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- Dynamic, reflective, general-purpose, object-oriented
- Influenced by Perl, Smalltalk, Eiffel, and Lisp
- Open-source
- Dynamic type system & Automatic memory management
- Ruby 1.0: 1996
- Ruby 1.8.7 >p249: 2010
- Ruby 1.9.2: Aug 2010
- Ruby 1.9.3: Oct 2011
- <http://www.ruby-lang.org/>

# RESTful Architecture

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- Representational State Transfer (REST) is a software architecture style for distributed systems
- Clients and servers
- Stateless
- Cacheable
- Layered System
- Code on Demand (optional)
- Uniform Interface
- Largest RESTful implementation: World Wide Web

# RESTful Architecture

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- 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

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- 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

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```
TK:lecture_02 thomask$ ruby --version  
ruby 1.9.2p290 (2011-07-09 revision 32553) [i686-linux]
```

```
TK:lecture_02 thomask$ rails --version  
Rails 3.2.8
```

```
TK:lecture_02 thomask$ 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

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```

TK:lecture_02 thomask$ rails new my_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

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```
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

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```
TK:my_first_rails_app thomask$ cd my_first_rails_app/  
TK:my_first_rails_app thomask$ rails s
```

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

Try running `bundle install`.

# Your first Rails Application

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```
TK:my_first_rails_app thomask$
  bundle install
```

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

```
Using rake (0.8.7)
```

```
Using abstract (1.0.0)
```

```
Using activesupport (3.1.1)
```

```
Using builder (2.1.2)
```

```
Using i18n (0.4.1)
```

```
Using activemodel (3.1.1)
```

```
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 (3.1.1)
```

```
Using mime-types (1.16)
```

```
Using polyglot (0.3.1)
```

```
Using treetop (1.4.8)
```

```
Using mail (2.2.7)
```

```
Using actionmailer (3.1.1)
```

```
Using arel (1.0.1)
```

```
Using activerecord (3.1.1)
```

```
Using activeresource (3.1.1)
```

```
Using bundler (1.0.2)
```

```
Using thor (0.14.3)
```

```
Using railties (3.1.1)
```

```
Using rails (3.1.1)
```

```
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

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```
TK:my_first_rails_app thomask$ 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

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```
TK:my_first_rails_app thomask$ 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

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```
TK:my_first_rails_app thomask$ rails s
```

```
=> Booting WEBrick
```

```
=> Rails 3.2.8 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
```

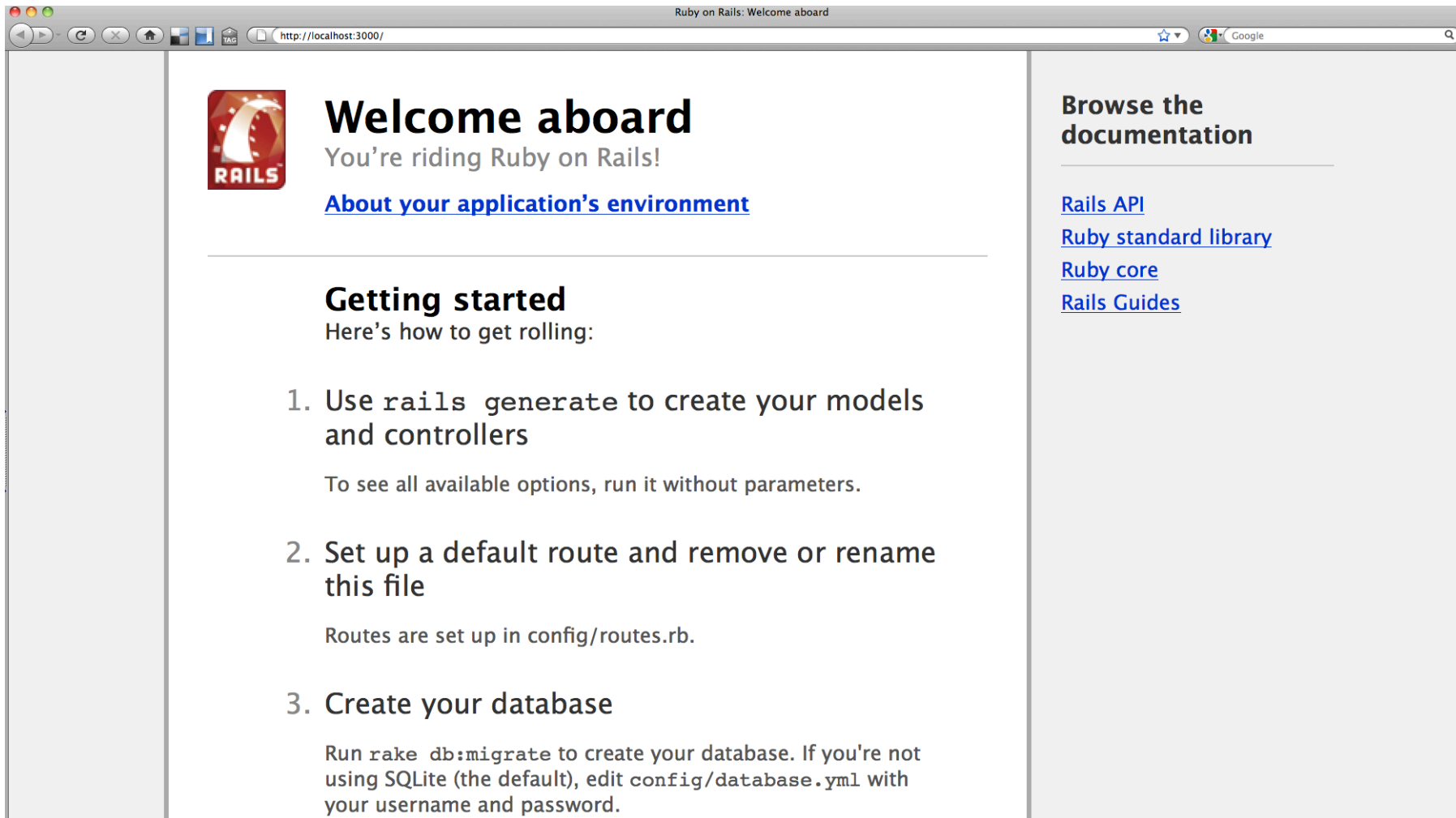
```
[2010-10-14 18:17:21] INFO ruby 1.8.7 (2010-06-23) [i686-  
darwin10]
```

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




# Your first Rails Application

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Ruby on Rails: Welcome aboard

http://localhost:3000/

 **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

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```
TK:my_first_rails_app thomask$ 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

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```
TK:my_first_rails_app thomask$ 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

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```
TK:my_first_rails_app thomask$ 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

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```
TK:my_first_rails_app thomask$ rm public/index.html
```

```
TK:my_first_rails_app thomask$ mate app/views/home/index.html.erb
```

```

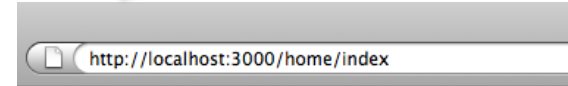
* index.html.erb
1 <h1>Home#index</h1>
2 <p>Hello World!</p>

```



## Routing Error

No route matches "/"



## Home#index

Hello World!

# Adjusting Rails Routes

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- 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

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1. TK:my\_first\_rails\_app thomask\$ **rake routes**

```
home_index
```

```
GET /home/index(:format)
```

```
:action=>"index", :controller=>"home"}
```

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

3. TK:my\_first\_rails\_app thomask\$ **rake routes**

```
home_index
```

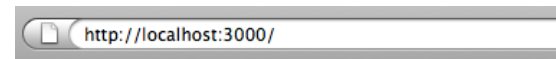
```
GET /home/index(:format)
```

```
:action=>"index", :controller=>"home"}
```

```
root
```

```
/(:format)
```

```
{:action=>"index", :controller=>"home"}
```

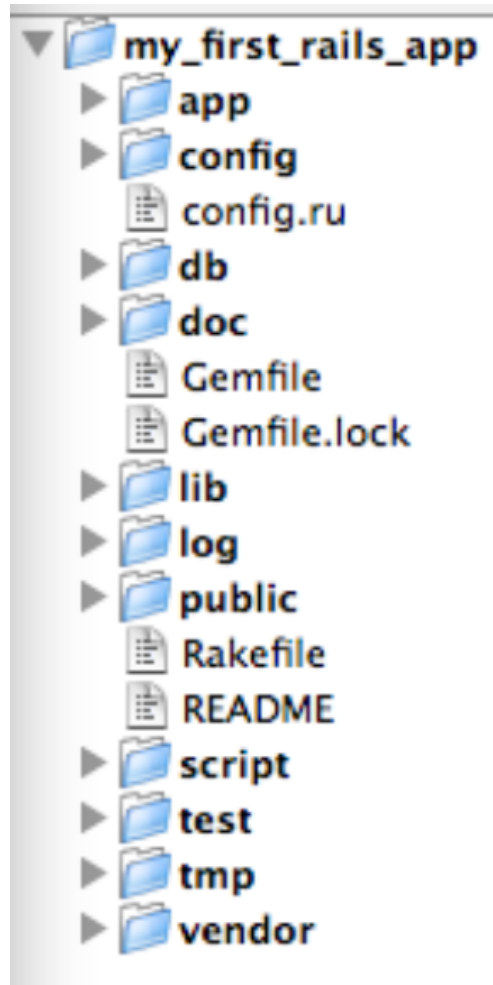


# Home#index

Hello World!

# Application Layout

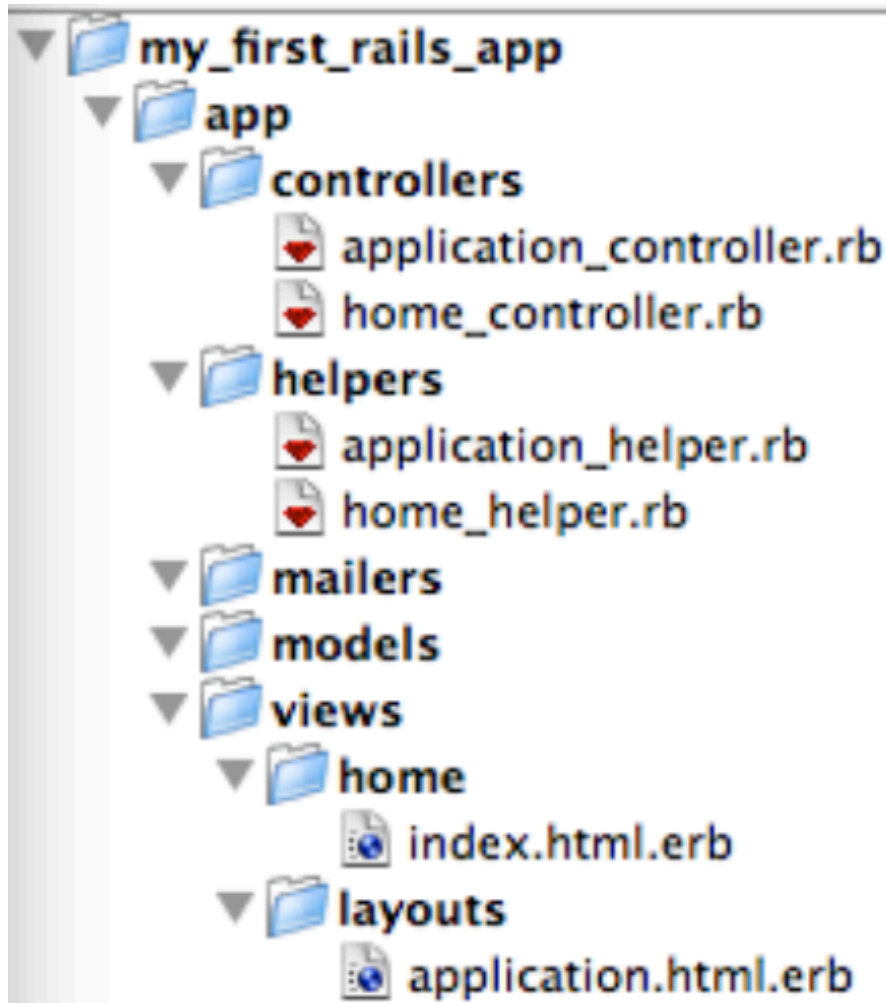
24





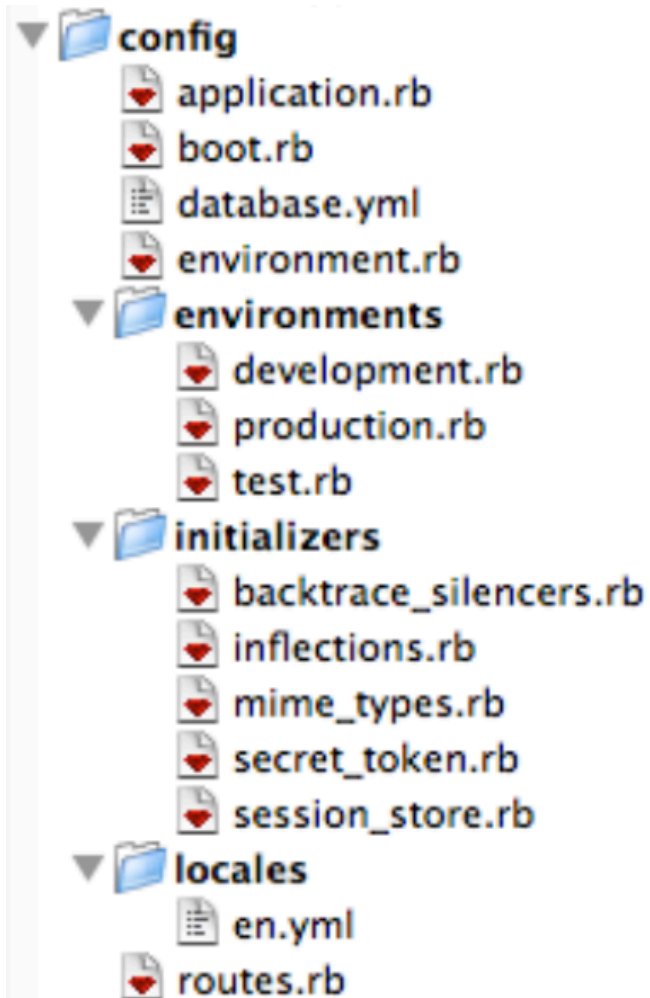
# Application Layout

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# Application Layout

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# Visiting the Source Code

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```

○ 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

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```

* 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

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## 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

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- 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

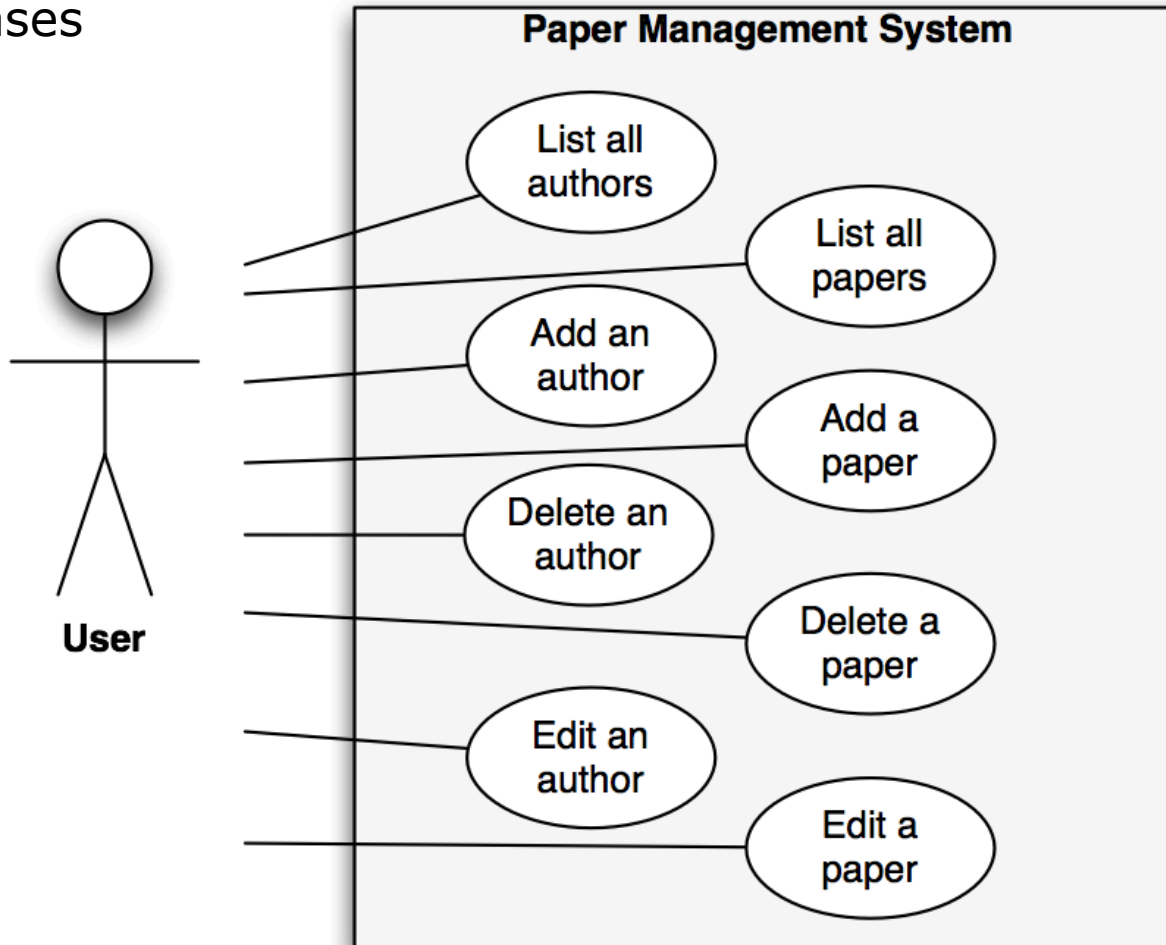
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- Goal: Get familiar with Ruby on Rails
- Task
  - Web-based paper management system
  - Author
    - ◇ First name
    - ◇ Last name
    - ◇ Homepage
  - Paper
    - ◇ Title
    - ◇ Publication
    - ◇ Year
  - A paper has many authors (max. 5)
  - An author has many papers
- We prepared a Rails application for you

# Exercise outline

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## Use Cases





# Exercise outline

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## Expected Sitemap



# Exercise outline

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Mockups:

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

## Paper Management System

[Show papers](#)

[Show authors](#)

## Listing authors

Name	Homepage	
<a href="#">Hasso Plattner</a>	<a href="http://www.hpi.uni-potsdam.de/personen/stifter.html">http://www.hpi.uni-potsdam.de/personen/stifter.html</a>	<a href="#">Edit</a> <a href="#">Delete</a>

[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](#)

# Evaluation

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- You have to pass this exercise to be eligible for the group exercise
- We have a 22 feature tests that will evaluate your implementation (I will show how later)
- Register at our web app: <http://192.168.30.90:3000> (HPI internal or VPN)
- Commit after each finished feature and check whether your solution works on our server
- Deadline (firm): Nov 9, 11:59pm CET

# How to start?

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- 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/SWT2_2012` (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, VirtualBox available for free on all platforms

# Rails installation and prerequisites

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- 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 1.9.2?
  - Use a Ruby version manager
  - Mac/Linux → RVM: <http://rvm.beginrescueend.com/>
  - Windows → PIK: <http://github.com/vertiginous/pik> (not tested)

# Git Installation

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- 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

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- Distributed versioning system

```
TK:lecture_02 thomask$ 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.


# Register for the Exercise

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## SWT2 Auto Exercise


### **SWT2 Preparation Exercise 2012**

Cucumbers 0 / 22 

Rspecs 0 / 0 

Repository Created?  [Look inside](#) or copy address below for 'git clone'

```
swt2_12_ex_720001@svn.hpi.uni-potsdam.de:swt2_12_ex_720001.git
```

Repository Initialized? 

Access Granted?  (for thomas.kowark)

Actions

Run Tests



# Git clone & Go

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```
TK:lecture_02 thomask$ git clone <your_repo>@svn.hpi.uni-  
potsdam.de:<your_repo>.git
```

```
Cloning into swt2_12_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.
```

```
TK:lecture_02 thomask$ cd swt2_12_exercise/
```

## Git clone & Go

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```
TK:swt2_12_exercise thomask$ git pull  
Already up-to-date.
```

```
TK:swt2_12_exercise thomask$ cp config/database.yml.default  
config/database.yml
```

```
TK:swt2_12_exercise thomask$ mate .
```

# Dependency management with Bundler

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```

* Gemfile
1 source 'https://rubygems.org'
2
3 gem 'rails', '3.2.8'
4 gem 'mysql2'
5
6 # Bundle gems for the local environment. Make sure to
7 # put test-only gems in this group so their generators
8 # and rake tasks are available in development mode:
9 group :test do
10   gem 'cucumber', '1.2.1'
11   gem 'cucumber-rails', '1.3.0'
12   gem 'database_cleaner', '0.9.1'
13   gem 'rspec-rails', '2.11.4'
14 end
15
16 # Gems used only for assets and not required in production environments by default.
17 group :assets do
18   gem 'sass-rails', '~> 3.2.3'
19   gem 'coffee-rails', '~> 3.2.1'
20   # See https://github.com/sstephenson/execjs#readme for more supported runtimes
21   # gem 'therubyracer', :platforms => :ruby
22   gem 'uglifyer', '>= 1.0.3'

```

# Dependency management with Bundler

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```
TK:swt2_12_exercise thomask$
```

## **bundle install**

```
Bundling your gems. This may take a few minutes on first run.
```

```
Using rake (0.9.2)
```

```
Using multi_json (1.0.3)
```

```
Using activesupport (3.1.1)
```

```
Using builder (3.0.0)
```

```
Using i18n (0.6.0)
```

```
Using activemodel (3.1.1)
```

```
Using erubis (2.7.0)
```

```
Using rack (1.3.4)
```

```
Using rack-cache (1.1)
```

```
Using rack-mount (0.8.3)
```

```
Using rack-test (0.6.1)
```

```
Using hike (1.2.1)
```

```
Using tilt (1.3.3)
```

```
Using sprockets (2.0.2)
```

```
Using actionpack (3.1.1)
```

```
Using mime-types (1.16)
```

```
Using polyglot (0.3.2)
```

```
Using treetop (1.4.10)
```

```
Using mail (2.3.0)
```

```
Using actionmailer (3.1.1)
```

```
Using arel (2.2.1)
```

```
Using tzinfo (0.3.30)
```

```
Using activerecord (3.1.1)
```

```
Using activeresource (3.1.1)
```

```
Using bundler (1.0.14)
```

```
Using nokogiri (1.5.0)
```

```
Using ffi (1.0.9)
```

```
Using childprocess (0.2.2)
```

```
Using json_pure (1.6.1)
```

```
Using rubyzip (0.9.4)
```

```
Using selenium-webdriver (2.8.0)
```

```
Using xpath (0.1.4)
```

```
Using capybara (1.1.1)
```

```
Using diff-lcs (1.1.3)
```

```
Using json (1.6.1)
```

```
Using gherkin (2.5.2)
```

```
Using term-ansicolor (1.0.7)
```

```
Using cucumber (1.1.0)
```

```
Using cucumber-rails (1.1.1)
```

```
Using database_cleaner (0.6.7)
```

```
Using mysql (2.8.1)
```

```
Using rack-ssl (1.3.2)
```

```
Using rdoc (3.10)
```

```
Using thor (0.14.6)
```

```
Using railties (3.1.1)
```

```
Using rails (3.1.1)
```

```
Using rspec-core (2.7.0)
```

```
Using rspec-expectations (2.7.0)
```

```
Using rspec-mocks (2.7.0)
```

```
Using rspec (2.7.0)
```

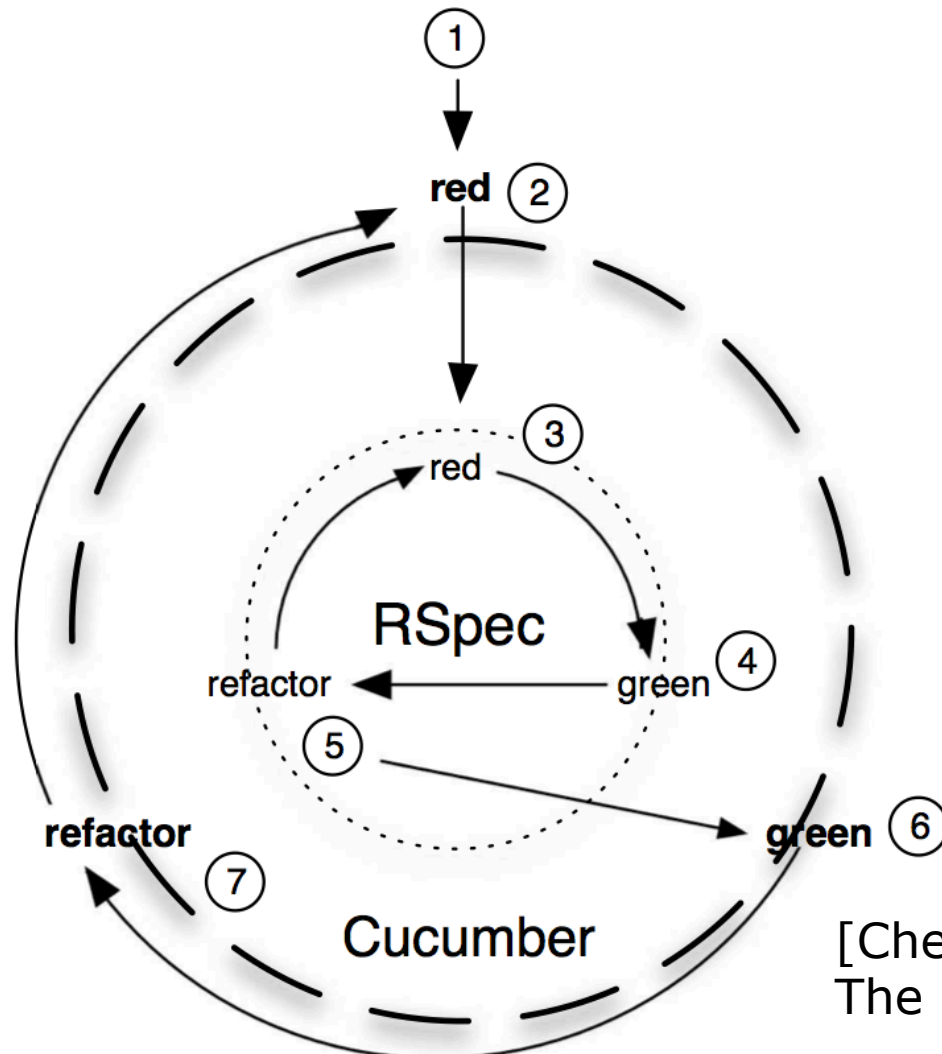
```
Using rspec-rails (2.7.0)
```

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

- 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)

# BDD Cycle

46



[Chelimsky et al.:  
The Rspec Book, 2010]

- 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

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- 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>



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```
> 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

50

**> 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

51

```
TK:swt2_12_exercise thomask$ rake -T
```

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

```
rake db:migrate # Migrate the database (options: VERSION=x,  
VERBOSE=false).
```

```
rake db:setup # Create the database, load the schema, and  
initialize with the seed data (use db:reset to also drop the  
db first)
```

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

```
[...]
```

# Run all Features

52

```
TK:swt2_12_exercise thomask$ 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/thomask/HPI/teaching/2010_WS_SWT2/git/slides/
lecture_02/swt2_12_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
[...]
```

```
22 scenarios (22 failed), 141 steps (141 skipped), 0m0.189s
```

# Feature "Add author"

53

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

54

```
TK:swt2_12_exercise thomask$ cucumber features/add_author.feature
```

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

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

Now, go and add a mapping in /Users/thomask/HPI/teaching/2010\_WS\_SWT2/git/slides/lecture\_02/swt2\_12\_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

55

```

* paths.rb * routes.rb * add_author.feature * web_steps.rb
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

56

```
TK:swt2_12_exercise thomask$ 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

57

```
TK:swt2_12_exercise thomask$ 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

58

```
TK:swt2_12_exercise thomask$ 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

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```
TK:swt2_12_exercise thomask$ 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

60

```
TK:swt2_12_exercise thomask$ rake -T db:
```

```
rake db:migrate # Migrate the database (options: VERSION=x,
VERBOSE=false).
```

```
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?
```

```
TK:swt2_12_exercise thomask$ rake db:migrate
```

```
== CreateAuthors: migrating
```

```
=====
```

```
-- create_table(:authors)
```

```
-> 0.0096s
```

```
== CreateAuthors: migrated (0.0097s)
```

```
=====
```

# Setting up the Database

61

```
TK:swt2_12_exercise thomask$ 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!

62

```
TK:swt2_12_exercise thomask$ rake db:migrate RAILS_ENV=test
== CreateAuthors: migrating =====
-- create_table(:authors)
   -> 0.0096s
== CreateAuthors: migrated (0.0097s) =====
```

```
TK:swt2_12_exercise thomask$ 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

63



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

# Next Steps are Implemented!

64

```
TK:swt2_12_exercise thomask$ 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:

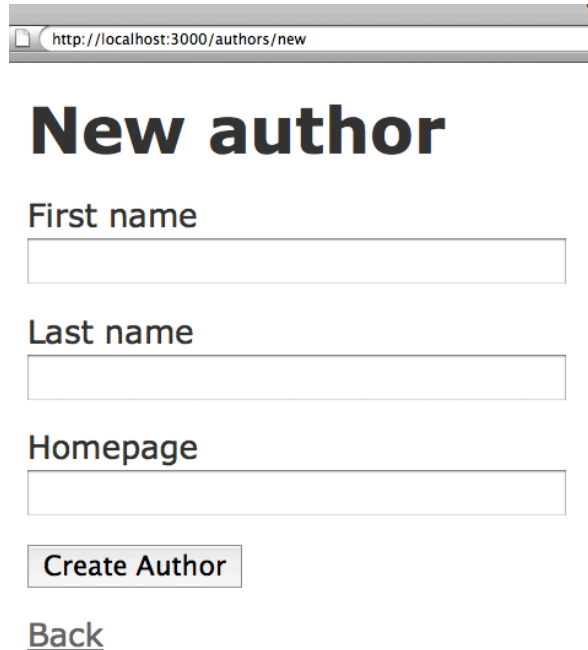
```
cucumber features/add_author.feature:9 # Scenario: Add a simple author
```

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



# Adjust the Form Partial

65



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!

66

```
TK:swt2_12_exercise thomask$ cucumber features/add_author.feature
. . . . F-

(::) failed steps (::)

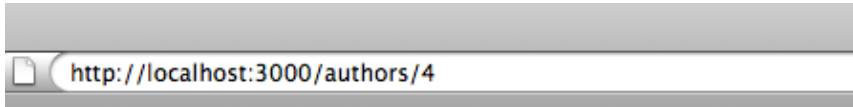
expected: "/authors",
  got: "/authors/1" (using ==) (RSpec::Expectations::ExpectationNotMetError)
./features/step_definitions/web_steps.rb:198:in `/(?|I )should be on (.+)$/'
features/add_author.feature:14:in `Then I should be on the authors page'

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

67



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 :-)

68

```
TK:swt2_12_exercise thomask$ 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

69

## Listing authors

| Name                                              | Homepage                                                                                                              |                                             |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <a href="#">Hasso Plattner</a>                    | <a href="http://www.hpi.uni-potsdam.de/personen/stifter.html">http://www.hpi.uni-potsdam.de/personen/stifter.html</a> | <a href="#">Edit</a> <a href="#">Delete</a> |
| <a href="#">Add author</a>   <a href="#">Back</a> |                                                                                                                       |                                             |

- 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!

70

```
TK:swt2_12_exercise thomask$ cucumber features/  
add_author.feature
```

```
.....
```

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

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

```
0m0.212s
```

# Our Implementation of "add\_authors"

71

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

72

```
TK:swt2_12_exercise thomask$ git status
# On branch thomask.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

73

```

TK:swt2_12_exercise thomask$ git add *
TK:swt2_12_exercise thomask$ 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

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```
TK:swt2_12_exercise thomask$ git commit -m "implemented the feature 'add_author'"  
[thomask.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
```

```
TK:swt2_12_exercise thomask$ git status  
# On branch thomask.mueller2  
# Your branch is ahead of 'origin/thomask.mueller2' by 1 commit.
```

# Publishing our Feature

75

```
TK:swt2_12_exercise thomask$ 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.
```

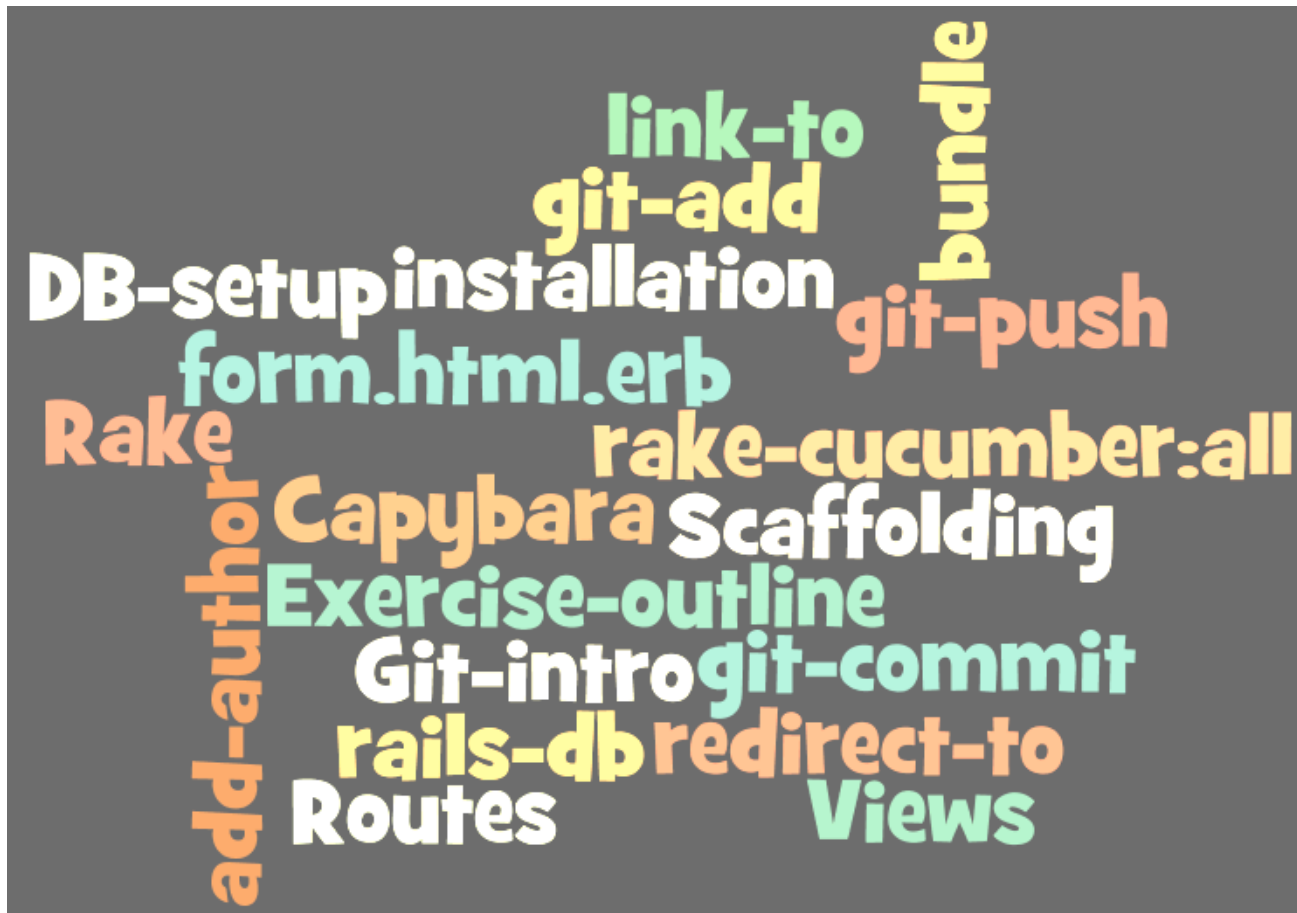
```
Total 30 (delta 6), reused 6 (delta 0)
```

```
To swt2_12_exercise@svn.hpi.uni-potsdam.de:swt2_12_exercise.git  
d14e137..e4cbaa4 thomask.mueller2 -> thomask.mueller2
```

# Summary

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What did we learn?



# Agenda

77

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

# ActiveRecord

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- Associations

| ActiveRecord Association                                      | Meaning                                                                                             |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <code>has_many :models</code>                                 | One-to-many relationship, foreign key in <model> table                                              |
| <code>has_one :model</code>                                   | One-to-one relationship, foreign key in <model> table                                               |
| <code>belongs_to :model</code>                                | One-to-one relationship, foreign key in own table                                                   |
| <code>has_and_belongs_to_many :models</code>                  | Many-to-many relationship with implicit join model                                                  |
| <code>has_many :association, :through =&gt; :joinmodel</code> | Many-to-many relationship with explicit join model (i.e. Student has_many teachers through courses) |

- [http://guides.rubyonrails.org/association\\_basics.html](http://guides.rubyonrails.org/association_basics.html)
- Validations: [http://guides.rubyonrails.org/active\\_record\\_validations\\_callbacks.html](http://guides.rubyonrails.org/active_record_validations_callbacks.html)
- Datatypes & Migrations: <http://guides.rubyonrails.org/migrations.html>

# Resources to help yourself

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## 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/SWT2\\_2012](smb://fs3/bbs/studentenaustauschordner/SWT2_2012)
- <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://guides.rubyonrails.org/>

# Let's get it started

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1. Enroll until Oct 31st
2. We will add you to a course wide mailing list
3. Form teams of 5-8 people
4. Problems?
  - Ask your colleagues: [swt2\\_2012@lists.hpi.uni-potsdam.de](mailto:swt2_2012@lists.hpi.uni-potsdam.de)
  - Mail us: [swt2\\_2012\\_orga@lists.hpi.uni-potsdam.de](mailto:swt2_2012_orga@lists.hpi.uni-potsdam.de)
5. Implement feature after feature (commit/push)
6. Finish the exercise until Nov 9, 11:59pm CET



# Documentation and Additional Literature

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

# Outlook

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- Testing in Rails

Thank you for  
your attention!