

CS 416

Web Programming

Ruby on RAILS

Chapter 6-7 User sign up and modeling

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A look ahead

- Look at building parts of scaffolding by hand -- how do the parts fit together
 - Create controller and view
 - Create model
- Working with model
- Validations
- Password hashing

Note full CSS for lectures now on class GitHub:

<https://github.com/CCSU-CS416F16/CS416F16CourseInfo/blob/master/custom.scss>

- Getting started

```
git checkout -b modeling-users
```

Create controller and sign up page

- Generate User controller and *new* view

```
rails generate controller Users new
```

Note: plural name for controller

- Change route to new view to */signup*

```
get '/signup', to: 'users#new'
```

- Update link path on home page: *signup_path*

- Update stub view to provide title to layout

```
<% provide(:title, 'Sign up') %>
```

- Update test for new route: *signup_path*

```
rails test
```

Create User model

- Generate User model

```
rails generate model User name:string  
email:string
```

Note: singular name for model

- And migrate

```
rails db:migrate
```

- Note: Can view data in SQLite using DB Browser for SQLite (<http://sqlitebrowser.org/>)

Working with Model

rails console **--sandbox**

- Create instance without saving

```
user = User.new(name: "Chad", email:  
"chad@ccsu.edu")
```

user.save

- Create instance and save

```
user = User.create(name: "Chad", email:  
"chad@test.org")
```

- Before save, rails check if valid: `user.valid?`

- Delete instance from DB

user.destroy

Finding Model elements

- Find by primary key

```
User.find(1)
```

- Find by specific attribute

```
User.find_by(email: "chad@ccsu.edu")
```

- Find first record

```
User.first
```

- Wild card

```
User.where(["name LIKE ?", "C%"])
```

- Retrieve all

```
User.all
```

Updating model

- Retrieve model, make change, save

```
user = User.find(1)
```

```
user.name = "Bob"
```

```
user.save
```

- Update and save all at once – and checks valid

```
user = User.find(1)
```

```
user.update_attributes(name: "Will",  
                       email: "will@test.org")
```

Validations - presence

- Presence – value and not blank

```
class User < ApplicationRecord
  validates :name, presence: true
end
```

- Test and see validity errors

```
user = User.new(name: " ", email: "c@c.com")
user.valid? (returns false)
user.errors.full_messages
user.save (returns false)
```

- **Add check for email presence to model**

Validations - length

- Length conditions

```
validates :name, length: { maximum: 50 }
```

```
validates :zipcode, length: { minimum: 5 }
```

```
validates :login, length: { in: 5..12 }
```

```
validates :state, length: { is: 2 }
```

Can add multiple conditions to each field

```
validates :name, presence: true, length: { maximum: 50 }
```

```
validates :email, presence: true, length: { maximum: 255 }
```

Validations - format

- Format validations can be specified by regular expressions

Note: naming standard for constants in Ruby all upper case

```
VALID_EMAIL_REGEX = /\A[\w+\-\.]+\@[a-z\d\-\\.]+\.[a-z]+\z/i
```

```
validates :email, presence: true,  
length: { maximum: 255 },  
format: { with: VALID_EMAIL_REGEX }
```

Try <http://www.rubular.com/> for creating/debugging regular expressions

Validations - uniqueness

- Checks to guarantee uniqueness

```
validates :email, uniqueness: true
```

Or

```
validates :email,  
  uniqueness: { case_sensitive: false}
```

(Enforces in Rails app, but does not enforce in DB)

Step 1 add:

```
before_save {email.downcase! }
```

Database indices

- In large DB doing a find on any string can be very costly unless it is indexed – *full table scan*
- Indexing allows a lookup to be done very quickly and also can enforce uniqueness at DB level
- To create index must create migration by hand

rails generate migration add_index_to_users_email

- Now add index to the migration

```
class AddIndexToUsersEmail < ActiveRecord::Migration[5.0]
  def change
    add_index :users, :email, unique: true
  end
end
```

- Then migrate

rails db:migrate

- **Delete test *fixture* users** in test/fixtures/users.yml, then migrate test

```
rails db:migrate RAILS_ENV=test
```

Note if you have data which doesn't comply with the index in either environment add `db:reset` before `db:migrate` to delete the data first

Password security

Storing passwords

- **You should NEVER EVER store a password in plaintext in the database**
- The right way to store any password is to instead store a secure hash of their password
- A secure hash is a one way function that ensure that from the hash no one can ever recover the original password, but your can quickly verify if the password is provided its hash matches the one stored

Adding a secure password

- Rails has built in functionality to help. Adding to your model:

```
class User < ApplicationRecord
  ...
  has_secure_password
end
```

This adds:

- Ability to save securely hashed `password_digest`
- Pair of virtual attributes: `password`, and `password_confirmation` that must be present and match for the model to be valid
- An `authenticate` method that returns the user when the password is correct, otherwise false.

Add password_digest

- For the has_secure_password to work we need a password_digest column on the table, so...
- Create a generation for it

rails generate migration

add_password_digest_to_users password_digest:string

- The standard naming allows rails to figure out which model and what field to add

```
class AddPasswordDigestToUsers <
  ActiveRecord::Migration[5.0]
    def change
      add_column :users, :password_digest, :string
    end
  end
end
```

- Then migrate

rails db:migrate

Add security gems

- Add bcrypt to Gemfile

```
gem 'bcrypt', '3.1.11'
```

```
~~~~~
```

```
bundle install
```

Using the has_secure_password functionality

- Now rather than:

```
user = User.new(name: "Chad" , email: "c@c.com" )
```

```
Yields user.valid? => false
```

- Now password must be provided and match:

```
user = User.new(name: "Chad" , email: "c@c.com",  
                password: "pass",  
                password_confirmation: "pass")
```

```
Yields user.valid? => true
```

Add presence and length restrictions to model

```
validates :password, presence: true,  
            length: { minimum: 6 }
```

User password usage - authenticate

- Now when user is retrieved from DB, can authenticate against password

```
User.create(name: "Chad", email: "C@chad.com", password:
"password", password_confirmation: "password")
```

```
user = User.first
```

```
User.authenticate("wrong")
=> False
```

```
user.authenticate("password")
=> #<User id: 2, name: "Chad", email: "c@chad.com",
created_at: "2016-11-16 05:46:24", updated_at: "2016-11-16
05:46:24", password_digest:
"$2a$10$scxQ6XtLYQvLtAxEPFpyze9tpuqyj5Uvj1LPK2MLtqj...">
```

Move to sign up

```
git add .  
git commit -m "Finish Ch 6"  
git checkout master  
git merge modeling-users
```

rails test

```
git push origin master  
git checkout -b sign-up
```

Adding debug information

- Take advantage of common page template and knowledge of environment to enable debug info

- In *application.html.erb*

```
<%= debug(params) if Rails.env.development? %>
```

Create REST operations

```
Rails.application.routes.draw do
  root 'static_pages#home'
  get  '/help',      to: 'static_pages#help'
  get  '/about',     to: 'static_pages#about'
  get  '/contact',   to: 'static_pages#contact'
  get  '/signup',    to: 'users#new'
  resources :users
end
```

Create simple *show* view/controller

rails routes:

HTTP request	URL	Action	Named route
GET	/users	index	users_path
GET	/users/ :id (.:format)	show	user_path(user)

- View app/views/users/show.html.erb

```
<% provide(:title, @user.name) %>
```

```
<h1>
```

```
  <%= @user.name %>, <%= @user.email %>
```

```
</h1>
```

- Add show method to controller

```
def show
```

```
  @user = User.find(params[:id])
```

```
end
```

Rails debugger

- Add debugger line to drop server into debugging – like a breakpoint

```
def show
```

```
  @user = User.find(params[:id])
```

```
    debugger
```

```
end
```

- When breakpoint is reached brings up byebug prompt

```
(byebug)
```

- Can interact just like rails console inspect and even change data, when done press Ctrl-D

Byebug quick reference

- Highly recommend:

<http://fleeblewidget.co.uk/2014/05/byebug-cheatsheet/>

To make break point conditional:

```
byebug if foo == "bar"
```

n[ext] <number>

Go to next line, stepping over function calls. If number specified, go forward that number of lines.

s[tep] <number>

Go to next line, stepping into function calls. If number is specified, make that many steps.

up <number> / down <number>

Step up/down stack trace.

w[here]

Display full stack trace.

h[elp] <command-name>

Get help. With no arguments, returns a list of all the commands Byebug accepts. When passed the name of a command, gives help on using that command.

Creating helper methods

- Add Gravatar (<http://en.gravatar.com/>) image to show page
`<%= gravatar_for @user %>`
- Each controller automatically generates corresponding helper class: *app/helpers/users_helper.rb*
- Add `gravatar_for` method:

```
# Returns the Gravatar for the given user.
def gravatar_for(user)
  gravatar_id = Digest::MD5::hexdigest(user.email.downcase)
  gravatar_url =
    "https://secure.gravatar.com/avatar/#{gravatar_id}"
  image_tag(gravatar_url, alt: user.name, class: "gravatar")
end
```

Try example@railstutorial.org

Creating sign up form

- Create a new user object to pass to form to be populated

```
class UsersController < ApplicationController
```

```
  def show
```

```
    @user = User.find(params[:id])
```

```
  end
```

```
  def new
```

```
    @user = User.new
```

```
  end
```

```
end
```

The sign up form

F16
early

```
<% provide(:title, 'Sign up') %>
```

```
<h1>Sign up</h1>
```

```
<div class="row">
```

```
  <div class="col-md-6 col-md-offset-3">
```

```
    <%= form_for(@user) do |f| %>
```

```
      <%= f.label :name %>
```

```
      <%= f.text_field :name %>
```

```
      <%= f.label :email %>
```

```
      <%= f.email_field :email %>
```

```
      <%= f.label :password %>
```

```
      <%= f.password_field :password %>
```

```
      <%= f.label :password_confirmation, "Confirmation" %>
```

```
      <%= f.password_field :password_confirmation %>
```

```
      <%= f.submit "Create my account", class: "btn btn-primary" %>
```

```
    <% end %>
```

```
  </div>
```

```
</div>
```

form_for

```
<%= form_for(@user) do |f| %>
    <%= f.label :name %>
    <%= f.text_field :name %>
    ...
<% end %>
```

Tells rails to generate code that is specifically designed to assign the passed fields to the object specified in the form_for

REST create action

- Route

POST /users(.:format) users#create

- Populating from form

```
def create
  @user = User.new(...)
  if @user.save
    # Handle a successful save.
  else
    render 'new'
  end
end
```

Strong parameters

- In previous rails this would work:

```
@user = User.new(params[:user])
```

Problem is just like concept of SQL injection, malicious user can write to any user field they want

- Correct way for using user input is ***strong parameters***
 - Explicitly state parameters expected and which allowed

```
params.require(:user).permit(:name, :email,  
:password, :password_confirmation)
```

Strong parameters cont.

- Revised create with strong parameters

```
def create
  @user = User.new(user_params)
  if @user.save
    # Handle a successful save.
  else
    render 'new'
  end
end

private

def user_params
  params.require(:user).permit(:name, :email,
    :password, :password_confirmation)
end
```


Displaying errors

- Create errors partial:

app/views/shared/_error_messages.html.erb

```
<% if @user.errors.any? %>
  <div id="error_explanation">
    <div class="alert alert-danger">
      The form contains <%= pluralize(@user.errors.count, "error") %>.
    </div>
    <ul>
      <% @user.errors.full_messages.each do |msg| %>
        <li><%= msg %></li>
      <% end %>
    </ul>
  </div>
<% end %>
```

Include in new page

```
<%= render 'shared/error_messages' %>
```

Revised new view - with error messages and style

```
<% provide(:title, 'Sign up') %>
<h1>Sign up</h1>

<div class="row">
  <div class="col-md-6 col-md-offset-3">
    <%= form_for(@user) do |f| %>
      <%= render 'shared/error_messages' %>

      <%= f.label :name %>
      <%= f.text_field :name, class: 'form-control' %>

      <%= f.label :email %>
      <%= f.email_field :email, class: 'form-control' %>

      <%= f.label :password %>
      <%= f.password_field :password, class: 'form-control' %>

      <%= f.label :password_confirmation, "Confirmation" %>
      <%= f.password_field :password_confirmation, class: 'form-control' %>

      <%= f.submit "Create my account", class: "btn btn-primary" %>
    <% end %>
  </div>
</div>
```

Adding sign up create for POST

Add to routes:

```
post '/signup', to: 'users#create'
```

Modify post location of new form:

```
<%= form_for(@user, url: signup_path) do |f| %>
```

Update success path:

```
def create
  @user = User.new(user_params)
  if @user.save
    flash[:success] = "Welcome to the Sample App!"
    redirect_to @user
  else
    render 'new'
  end
end
```

Flash messages

```
flash[:success] = "Welcome to the Sample App!"
```

- *Flash* is a built in mechanism in Rails to show a message on a subsequent page, but have it disappear on refresh or visiting a 2nd page
- Common flash types:
 - `:success`
 - `:info`
 - `:warning`
 - `:danger`

Add display of flash messages to site layout

```
<div class="container">
  <% flash.each do |message_type, message| %>
    <div class="alert alert-<%= message_type %>">
      <%= message %>
    </div>
  <% end %>
  <%= yield %>
  <%= render 'layouts/footer' %>
  <%= debug(params) if Rails.env.development? %>
</div>
```

Force SSL in production

- *config/environments/production.rb*

```
# Force all access to the app over SSL,  
# use Strict-Transport-Security,  
# and use secure cookies.
```

```
config.force_ssl = true
```

Push to Heroku