CS 155

Section 4

Project 2

- Deadlines
  - Pt 1: Tuesday, May 12
  - Pt 2: Tuesday, May 19
- Cross Site Scripting, SQL Injection, CSRF, Session Hijacking, Click-Jacking

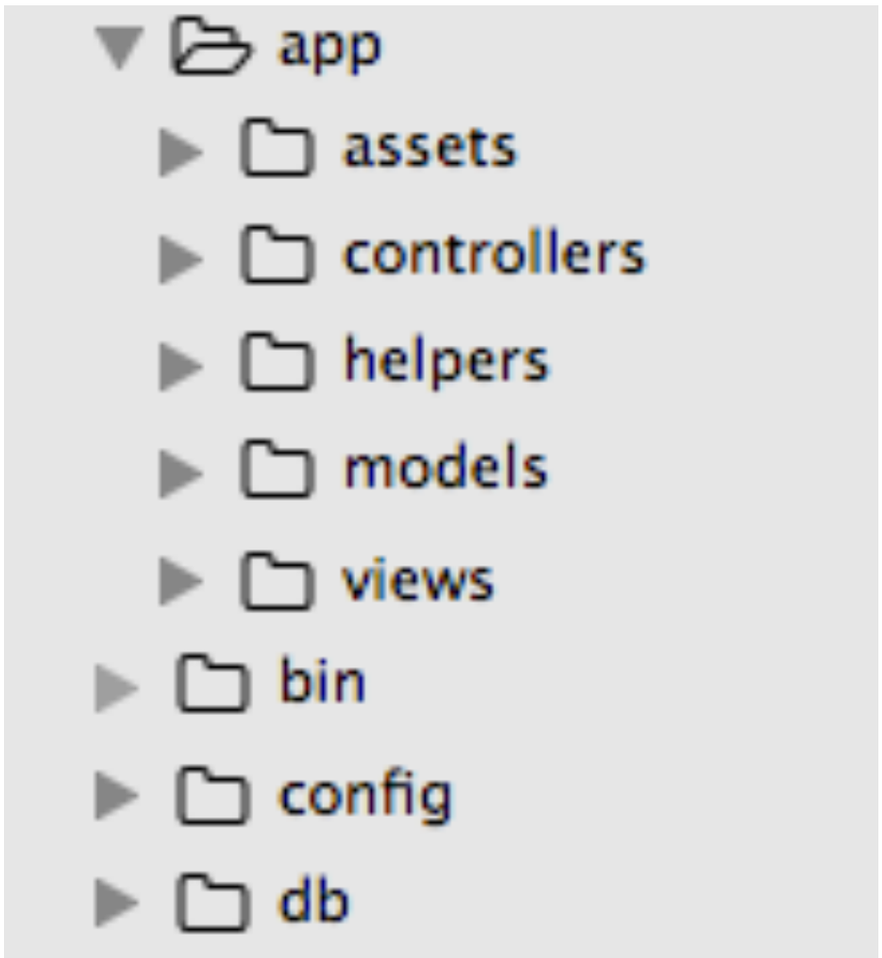
Outline

- Ruby on Rails
- Forms
- Javascript
- Warmup Exercise Demo

Rails Basics

- Start Server: **rails server** (CTRL+C to stop)
- Database
  - **rails dbconsole** (to access SQLite)
  - **rake db:reset** (resets database)

Directory Structure



- app/
- config/routes.rb
- config/initializers
- db/schema.rb
- db/seeds.rb

Models

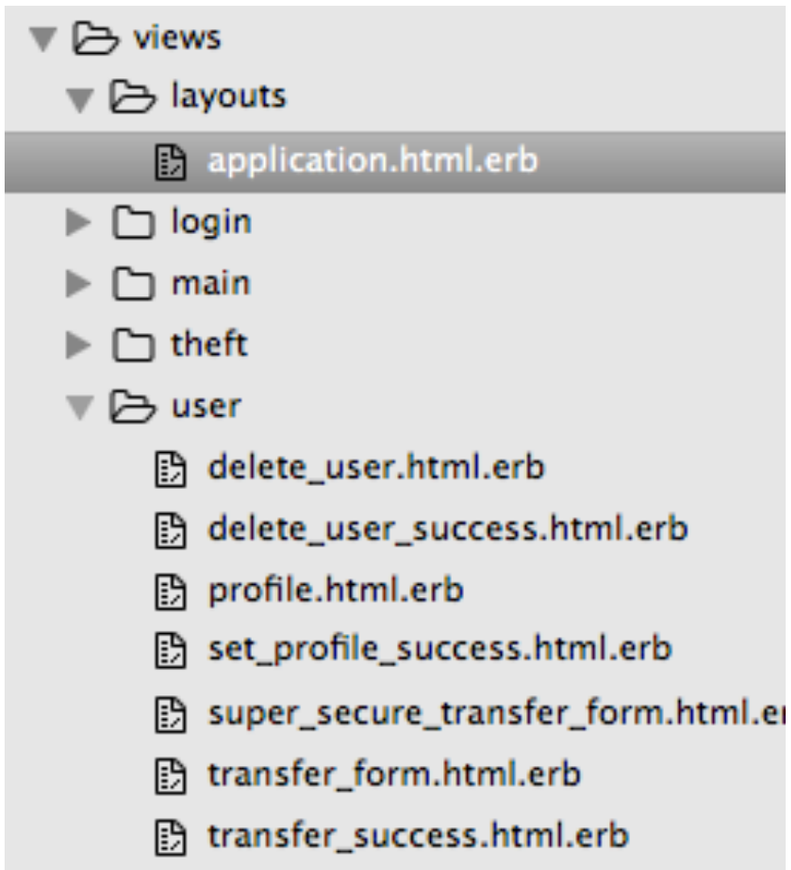
- Object-Relation Mapping
- User object => users table

```
@user = User.new
@user.username = username
@user.salt = generate_random_salt
@user.hashed_password = hash_password(password, @user.salt)
@user.profile = ""
@user.bitbars = 200
@user.save
```

```
@user = User.find_by_username(@username)
```

Views

- .html.erb files
- Located in folders associated with each controller
- Pass in variables from controller
  - <%= @user.username %>
  - <% if %> … <% end %>



Controllers

login_controller.rb:

```ruby
def login
  render :login_form
end

def post_login
  @username = params[:username]
  @password = params[:password]

  @user = User.find_by_username(@username)

  # do stuff
  if @error
    render :login_form
  else
    session[:logged_in_id] = @user.id
    render :login_success
  end
end

def logout
    if @logged_in_user then
        reset_session
    end
    redirect_to(:controller => "main", :acti
end
```

- Routes

```
method 'path' => 'controller#action'
```

```
get 'login' => 'login#login'
```

- Define “actions”
- Render views
- Set / pass variables
- Redirect to actions

Forms

```
<form action="/profile" method="get">
    <input type="text" name="username">
    <input type="submit" value="Show">
</form>
```

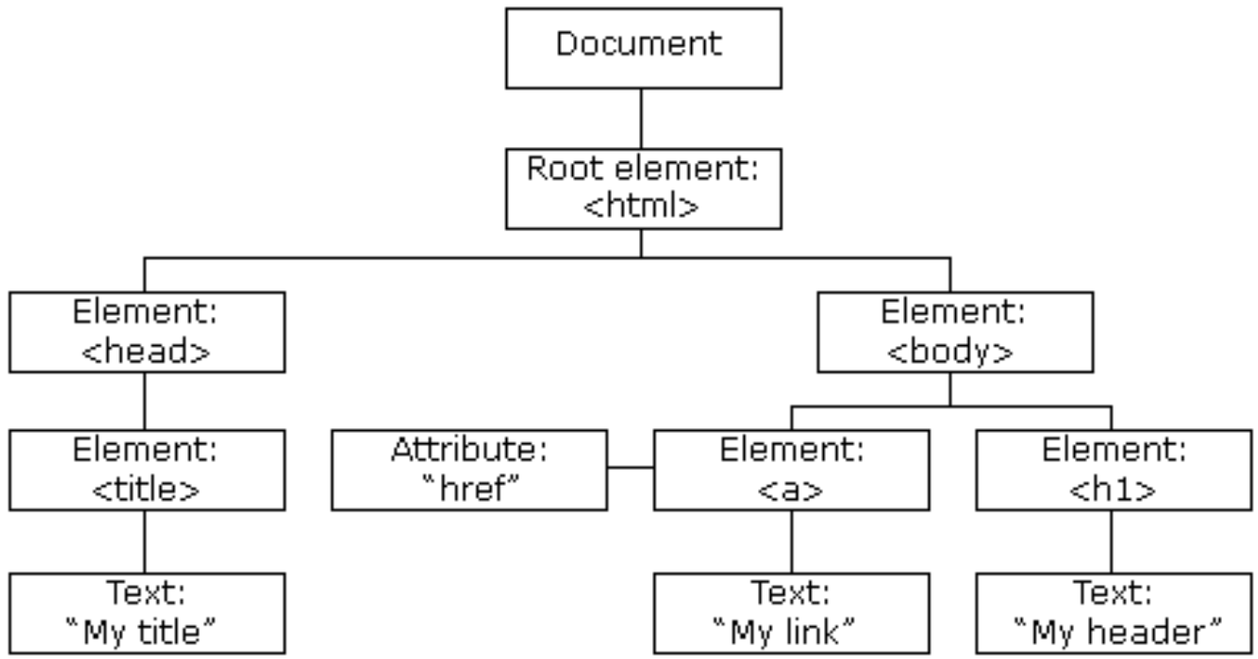
- Action specifies destination URL
- GET method sends data in URL (e.g. search queries)
  - google.com/q=cats+steal+dog+beds
  - localhost:3000/profile?username=cathy&password=cat
- POST method sends data in HTTP body

Forms

```
def post_login
  @username = params[:username]
  @password = params[:password]
```

- Retrieve data using params[:name]

Javascript (DOM)



- Each html document has elements
- Javascript can access, create, delete elements
- http://www.w3schools.com/js/js_htmldom.asp

Javascript (DOM)

- document
  - document.getElementById()
  - document.getElementsByTag()
- window
  - window.location=‘www.evil.com’
- element
  - element.id, element.innerHTML, element.style
- var iframe = document.getElementsByTag(‘iframe’)
- iframe.contentDocument (same origin as parent page)
- https://developer.mozilla.org/en-US/docs/Web/API/Document_Object_Model/Introduction

Javascript

- XMLHttpRequest
  - var req = new XMLHttpRequest();
  - req.open(“GET”, “google.com”, false);
  - req.send();
- Timers: setTimeout(function(){alert(‘hey’)}, 300);
- Event Listeners: onload, onmouseover, onclick, onsubmit
- https://www.owasp.org/index.php/Cross-site_Scripting_%28XSS%29

Warmup Demo

Mechanize

- Automating web interactions

```ruby
#!/usr/bin/env ruby
require 'mechanize'

agent = Mechanize.new
page = agent.get "http://localhost:3000/login"

form = page.forms.first
form['username'] = 'attacker'
form['password'] = 'attacker'
results = agent.submit (form)

cookie = agent.cookie_jar.jar
puts cookie
```

- http://www.rubydoc.info/gems/mechanize/Mechanize
- https://github.com/sparklemotion/mechanize