Ruby Workshop

Outline

- Intro to Ruby
- Intro to the Web and MVC
- Ruby on Rails

Ruby Philosophy

- Principle of Least Surprise
- Made to optimize developer happiness

Installing Ruby

- I recommend using Ruby Version Manager (RVM) to manage multiple Ruby versions. You may end up just using one Ruby version, but this makes it a lot easier.
- I will be using Ruby version 2.2.2.
- When you have trouble remembering what methods do, use Ruby Docs. They're very helpful.

Printing in Ruby

- You can print a value with two different commands `print` and `puts`.
- `print` outputs the value and returns nil.
- `puts` ouputs the value with a newline and returns nil.
- I will denote output with `#=>`.

```
puts 'hello world'
#=> "hello world"
```

Running Ruby

- Use a REPL (Read-Execute-Print-Loop) with the `irb` command in terminal.
- Execute .rb files with the `ruby` command: `ruby file.rb`.

Methods

- Parentheses around arguments can be omitted if unambiguous.
- Methods have implicit returns.

```
def hi
  'hello, there'
end

def hello(name)
  puts "hello, #{name}"
end

puts hi #=> "hello, there"
hello('Matz') #=> "hello, Matz"
hello 'DHH' #=> "hello, DHH"
```

Creating a Class

- Just use the `class` and `end` keywords.
- A class can be instantiated with the `new` method.
- It is convention to write class names in PascalCase.

```
class Student
end
student = Student.new
p student #=> #<Student:0x007ff7989d44b8>
```

Instance Methods

- Methods defined in a class are instance methods by default.

```
class Student
  def greet
    puts 'hi'
  end
end
student = Student.new
student.greet #=> "hi"
```

Constructors

- If a method is named `initialize`, then it will be executed when the class is instantiated.

```
class Student
  def initialize
    puts 'hi'
  end
end
Student.new #=> "hi"
```

Inheritance

- Classes can inherit from another class with the `<` operator.
- Simply place it after the class declaration and name the class.
- Thus, a class can gain all of its parent class’s methods, both public and private.

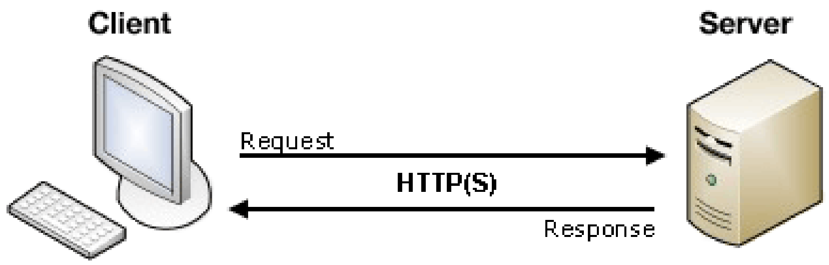
```
class Bird
end
class Penguin < Bird
end
p Penguin.superclass #=> "Bird"
```

Installing Gems

- Ruby libraries are called gems.
- The command to install them is `gem install gem_name`.
- When installed, the gem is installed in the current Ruby version’s gem directory.
- To use a gem, pass the name of the gem as a string to the `require` method at the top of the file (e.g. `require 'pry'`).

The Web

HTTP

- Stands for Hypertext Transfer Protocol.
- A *client* (e.g. web browser, phone, computer, etc.) sends a *request* to a *server*.
- The *server* receives this *request* and sends back a *response*.
- This *response* is usually a web page (i.e. HTML with accompanying files) or data, usually in XML 

or JSON.

Bothwell Douglas J. *client-server.png*. 2015. https://developer.mozilla.org/en-US/docs/Web/Guide/HTML/Forms/Sending_and_retrieving_form_data

HTTP Verbs

- The five most common types of HTTP requests are:
    - GET
    - POST
    - PUT/PATCH
    - DELETE

GET Request

- This is usually the default type of request sent.
    - When you enter a URL or click a link, a GET request is sent for the web page.
    - When a web page updates, it probably sent a GET request behind the scenes to get the new data.
- It should only be used to *get* something.

POST Request

- This should be used to *send* data from the client to the server.
- While you can technically use GET requests to send data as well, you should absolutely use POST requests if you’re sending data.
    - It’s much more robust and secure.
- This is the default type of request sent when submitting a form (e.g. log in).

PUT/PATCH Request

- This should be used to *update* something on the server.
- Technically, you can use a POST request to update as well, but it is convention to use a PUT or PATCH request.
- The main difference between a PUT request and a PATCH request is that a PUT request is used to update an entire record while a PATCH request is only used to update part of it.
- In this course, we will use PUT.

DELETE Request

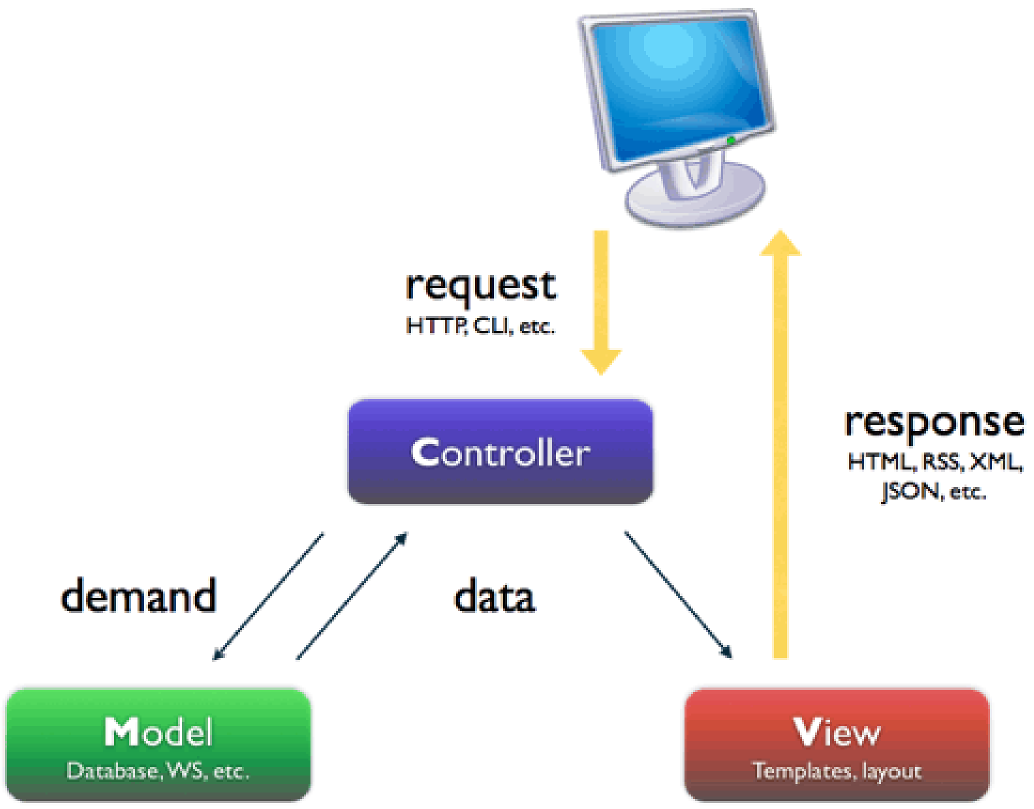
- This should be used to *delete* something on the server.
- Technically, you can use a POST request to delete as well, but it is convention to use a DELETE request.

MVC

- Stands for Model-View-Controller.
- Every community has different definitions and conventions for MVC, so ignore the conventions of other communities when writing Ruby.
- Convention over configuration.

View

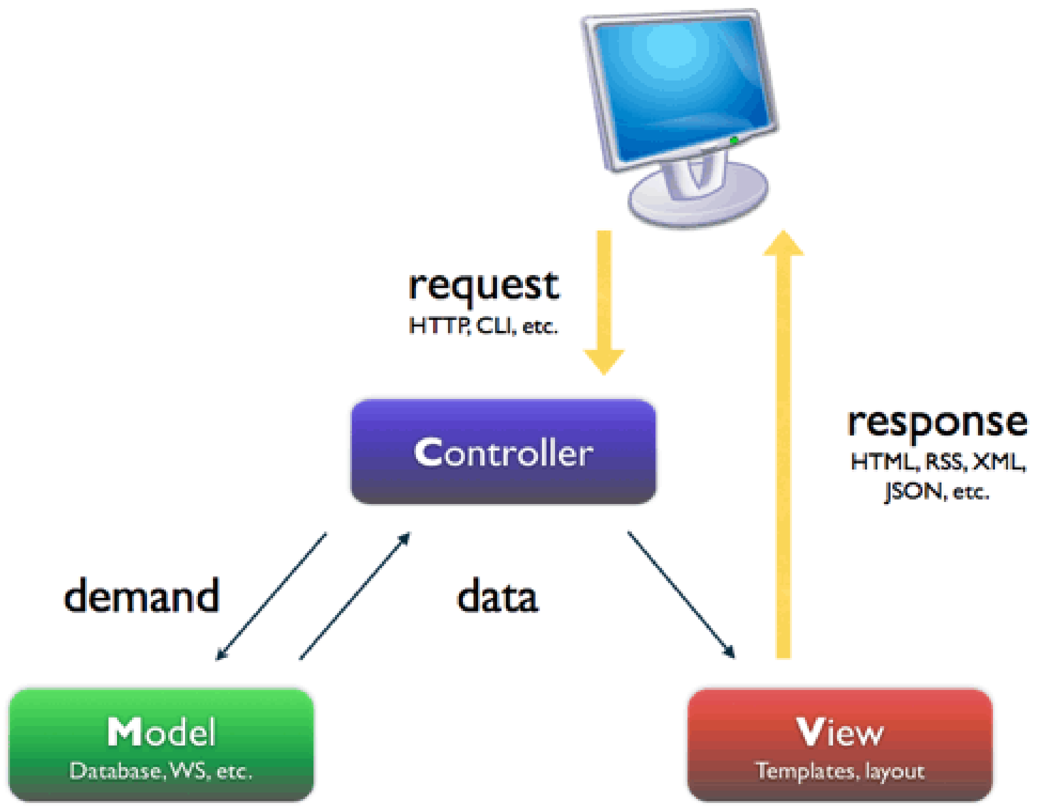
- The view is the layer of the application that the user will see.
- It is typically comprised of .html.erb files.
- It should have minimal logic in it.
- It can access instance variables defined in the controller.
- The corresponding view files should be in a subdirectory of `views` named for the plural form of the corresponding model.



Riaz, Zaman. *mvc.png*. 2014. http://code.tutsplus.com/tutorials/from-beginner-to-advanced-in-opencart-understanding-mvc--cms-21627

Controller

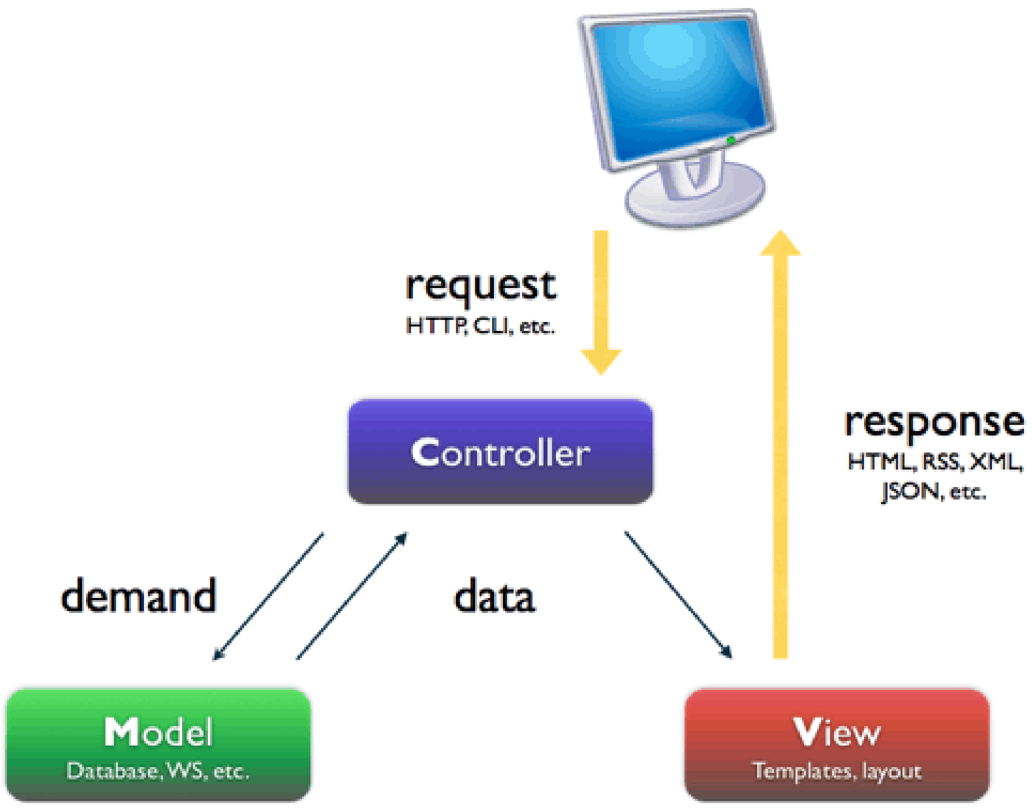
- The controller is the layer of the application that handles HTTP requests.
- It should pass off as much logic to the model as possible.
- It can define instance variables for the view to use.
- This layer of the application should be the most static out of the three.
- The naming convention is the plural form of the corresponding model with `Controller` (e.g. `UsersController`).



Riaz, Zaman. *mvc.png*. 2014. http://code.tutsplus.com/tutorials/from-beginner-to-advanced-in-opencart-understanding-mvc--cms-21627

Model

- The model is the layer of the application with the crux of the logic.
- It should be the main place where the database is accessed.
- The classes you wrote in homeworks 2 and 3 would be in the model layer.
- The naming convention is the singular form of the name.



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REST

- Stands for Representational State Transfer (a set of conventions to expose certain HTTP endpoints).
- It is convenient for Create, Read, Update, Delete (CRUD) apps.
- The below example is for a model representing movies.

Path	Verb	Usage
/movies	GET	Show list of movies
/movies/new	GET	Show form to create new movie
/movies	POST	Create a new movie
/movies/:id	GET	Show a specific movie
/movies/:id/edit	GET	Show form to update a movie
/movies/:id	PUT/PATCH	Update a movie
/movies/:id	DELETE	Delete a movie

Ruby on Rails

About Ruby on Rails

- Also called RoR or most commonly Rails.
- It is a web framework, similar to Sinatra, but it has far more features and opinions.
- We will use version 4.2.5.

Making a Rails App

- After you `gem install rails`, run `rails new app_name`.
- Rails will then create a directory of your Rails app with all the basic directories and files.
- It will also `bundle install` all the default gems.
- Check out the Rails documentation.

Rails Commands

- `rails server` (or `rails s`) will start the Rails app.
    - By default, the server uses WEBrick. To use other servers, put the server's gem in the Gemfile (Heroku recommends using `puma`).
- `rails console` (or `rails c`) will start the Rails console.

Rails Generate

- `rails generate` (or `rails g`) will generate various files for you.
- There are several different kinds of generators.
- The most useful ones (for me at least) are `migration`, `model`, and `controller`.
- `rails g scaffold` helped make Rails famous. It generates tests, controllers, views, routes, models, and migrations.
    - The generated code is too vanilla for actual use though.

Rails Generate Syntax

- `rails g generator_name model_name`.
- For `migration`, `model`, and `scaffold`, you can also specify attributes, which would be the column titles.
    - `rails g generator_name model_name column1:type column2:type`.
- For example, `rails g migration Item name:string price:float`.
- For foreign keys, use the `references` type.

Controller

- Each route is defined as methods according to its corresponding RESTful route.
- By default, it will render the corresponding view file, but you can render whatever view with the `render` method (e.g. `render :show` will render the model's `show.html.erb` page).

Routes

- The routes are managed in the `config/routes.rb` file.
- `resources :pluralized_model_name` generates all seven RESTful routes.
- To define custom routes, use the syntax `http_verb 'route' => 'model_name#method'`.
    - So for example, `get 'users/hello' => 'user#hello'` would connect the `hello` method in `UsersController` to a GET request to `users/hello`.

Rails Directory

- Notice that most of this directory structure should be familiar to you.
- The main directories not introduced to you yet are: `lib`, `log`, `test`, `tmp`, and `vendor`.
- `test` contains test files, `log` contains error logs, and `tmp` contains temporary files.
- `app/helpers` contains modules.

Asset Pipeline

- Introduced in Rails 2011.
- It is a way to load resources (i.e. images, javascripts, and stylesheets).
- It is comprised of the `app/assets`, `lib`, and `vendor` directories.

What Should Go Where

- The custom code you write specific to your application should go in `app/assets`.
- The custom code you write not specific to your application should go in `lib` (It's pretty rare to use this).
- 3rd party libraries should go in `vendor`.

Sprockets

- Sprockets is an asset packaging system.
- The stylesheet one can be found at `app/assets/stylesheets/application.css`.
- The javascript one can be found at `app/assets/javascripts/application.js`.
- They are both loaded in the head tag.
- Notice how javascript files are loaded with `<%= javascript_include_tag %>` and stylesheet files are loaded with `<%= stylesheet_link_tag %>`.

Sprocket Application Files

- To require a file, append an = to the beginning of the commenting delimiter (e.g. `//=` for javascript).
- `require_tree .` requires all files in the directory.
  - I try not to use this because it loads the files in alphabetical order, and the order usually matters for me.
- Never write any javascript/css code directly in the application files (`require_self` will let you do this).