GET YOUR WD-40

Cuz we got some CRUD in here.

TODAY

- Get some more reps with the whole CRUD thing so we just grok the crap out of it from now on
- Edit our models
- Put some more validations on models
- Learn just a tiny bit about associating models.

RESOURCEFUL ROUTING

- Remember, routing is the beginning of all requests to your rails application.

- Route to controller, controller to model, controller to view, rendered HTML back to the requesting user's browser.

RESOURCEFUL ROUTING

- We've learned:
  - Displaying a list of items from a database
  - Displaying a form and accepting input from it to create items in our database.
  - Displaying a "detail" page.
- What's left:
  - Displaying an "edit" form and updating the data in the database.

REVISITING "CRUD"

- CRUD stands for:
  - Create - Displaying a form and creating data from user input
  - Read - Displaying information about a single or collection of models
  - Update - Update attributes on a particular model in the database.
  - Delete - Delete a single model from the database

RAILS ROUTES MIMIC THE CRUD

- When you define a route with "resources :photos" for example, you get these routes:

```
➜ resources  rake routes
    Prefix Verb   URI Pattern                  Controller#Action
    photos GET    /photos(.:format)            photos#index
           POST   /photos(.:format)            photos#create
 new_photo GET    /photos/new(.:format)        photos#new
edit_photo GET    /photos/:id/edit(.:format)   photos#edit
     photo GET    /photos/:id(.:format)        photos#show
           PATCH  /photos/:id(.:format)        photos#update
           PUT    /photos/:id(.:format)        photos#update
           DELETE /photos/:id(.:format)        photos#destroy
```

CRUD IN THE ROUTES

```
Create
POST   /photos(.:format)          photos#create
GET    /photos/new(.:format)      photos#new

Read
GET    /photos(.:format)          photos#index
GET    /photos/:id(.:format)      photos#show

Update
GET    /photos/:id/edit(.:format) photos#edit
PATCH  /photos/:id(.:format)      photos#update
PUT    /photos/:id(.:format)      photos#update

Delete
DELETE /photos/:id(.:format)      photos#destroy
```

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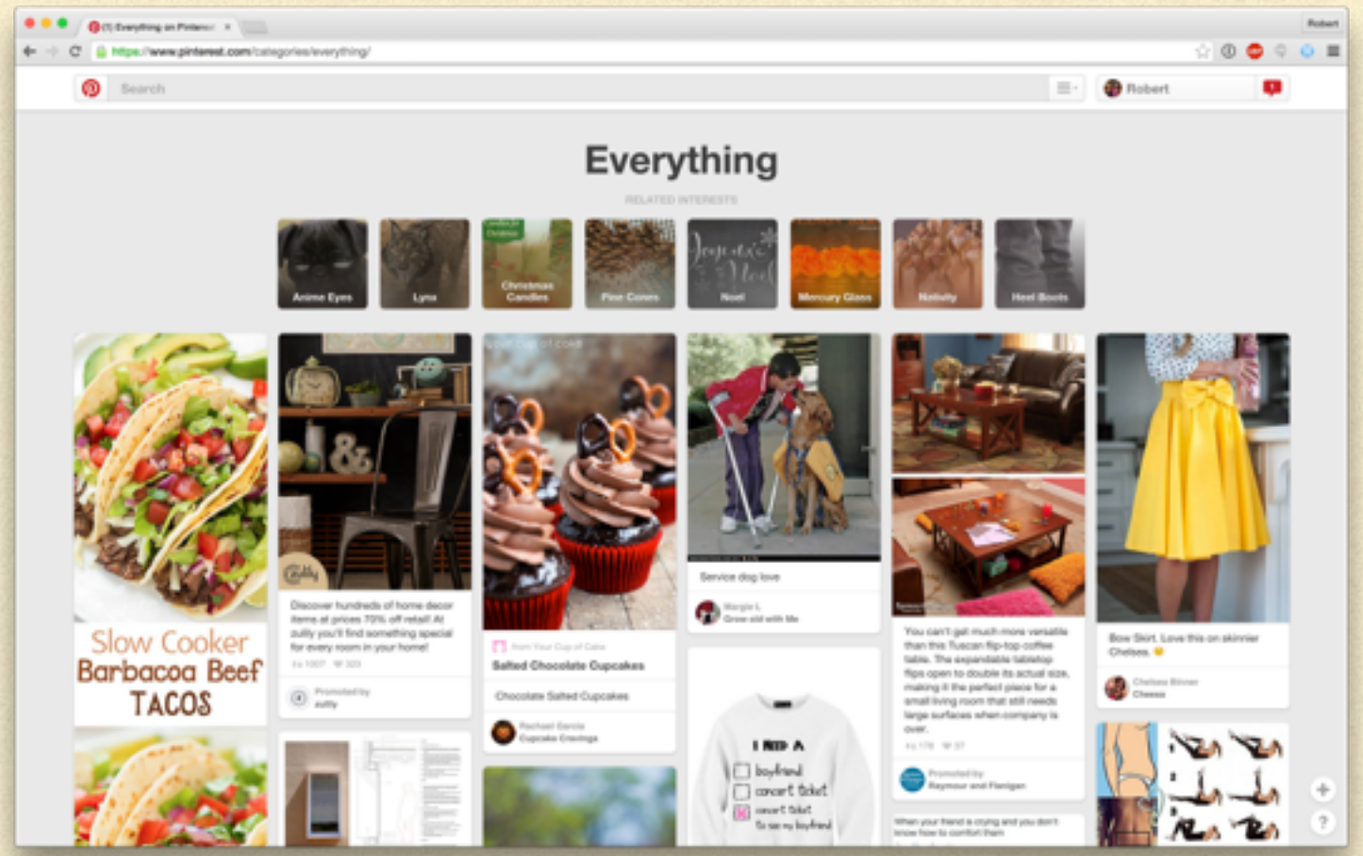
     photo GET    /photos/:id(.:format)        photos#show
           PATCH  /photos/:id(.:format)        photos#update
           PUT    /photos/:id(.:format)        photos#update
           DELETE /photos/:id(.:format)        photos#destroy
```

THE POINT OF ACTIONS

- Here is a list of controller actions and their respective part in "CRUD"
  - new, create - Create
  - show, index - Read
  - edit, update - Update
  - delete - Delete (or destroy)

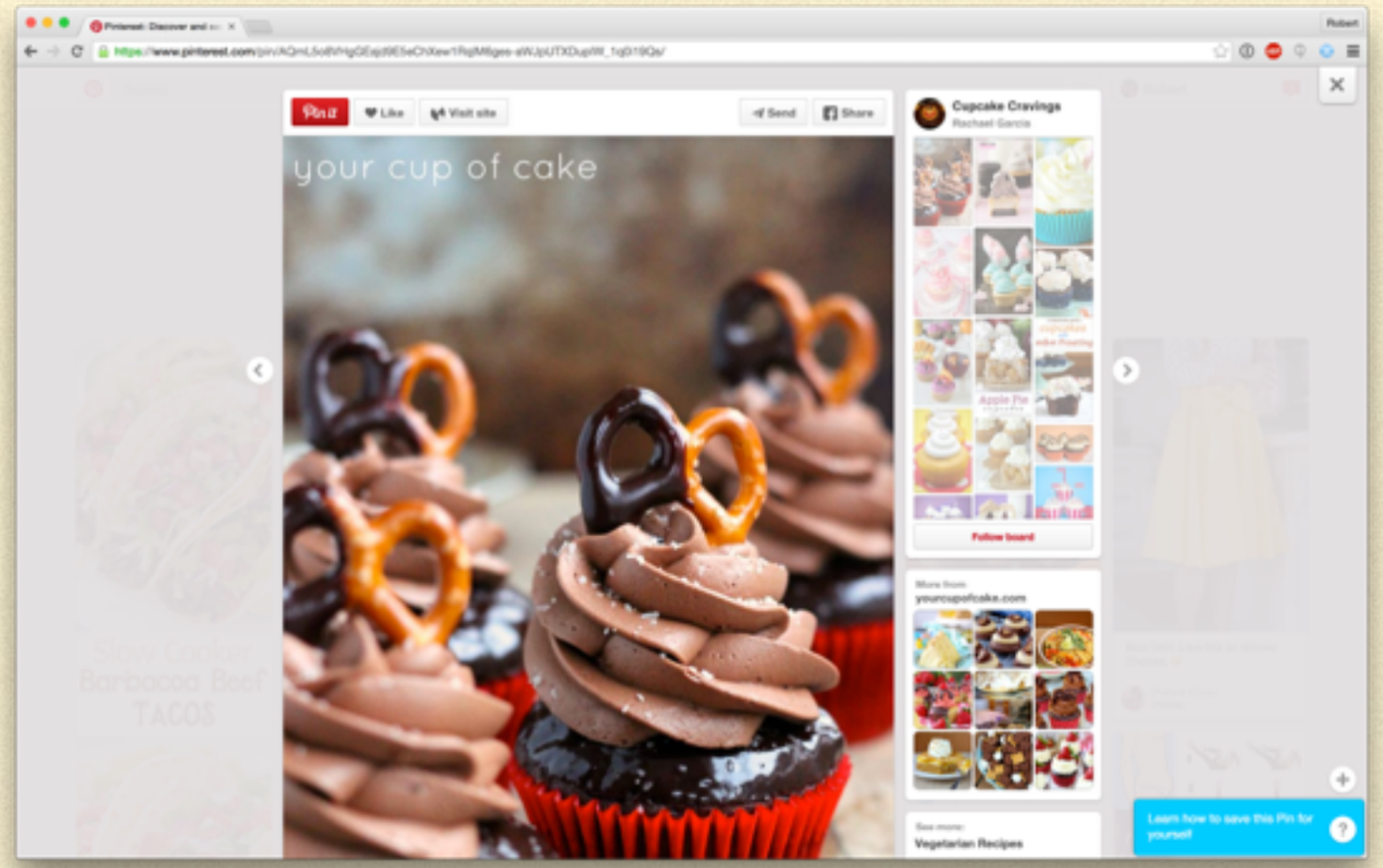
THE CRUD IN ACTION

- The “index” action for reading, should typically display a list of something. Or “starting point”



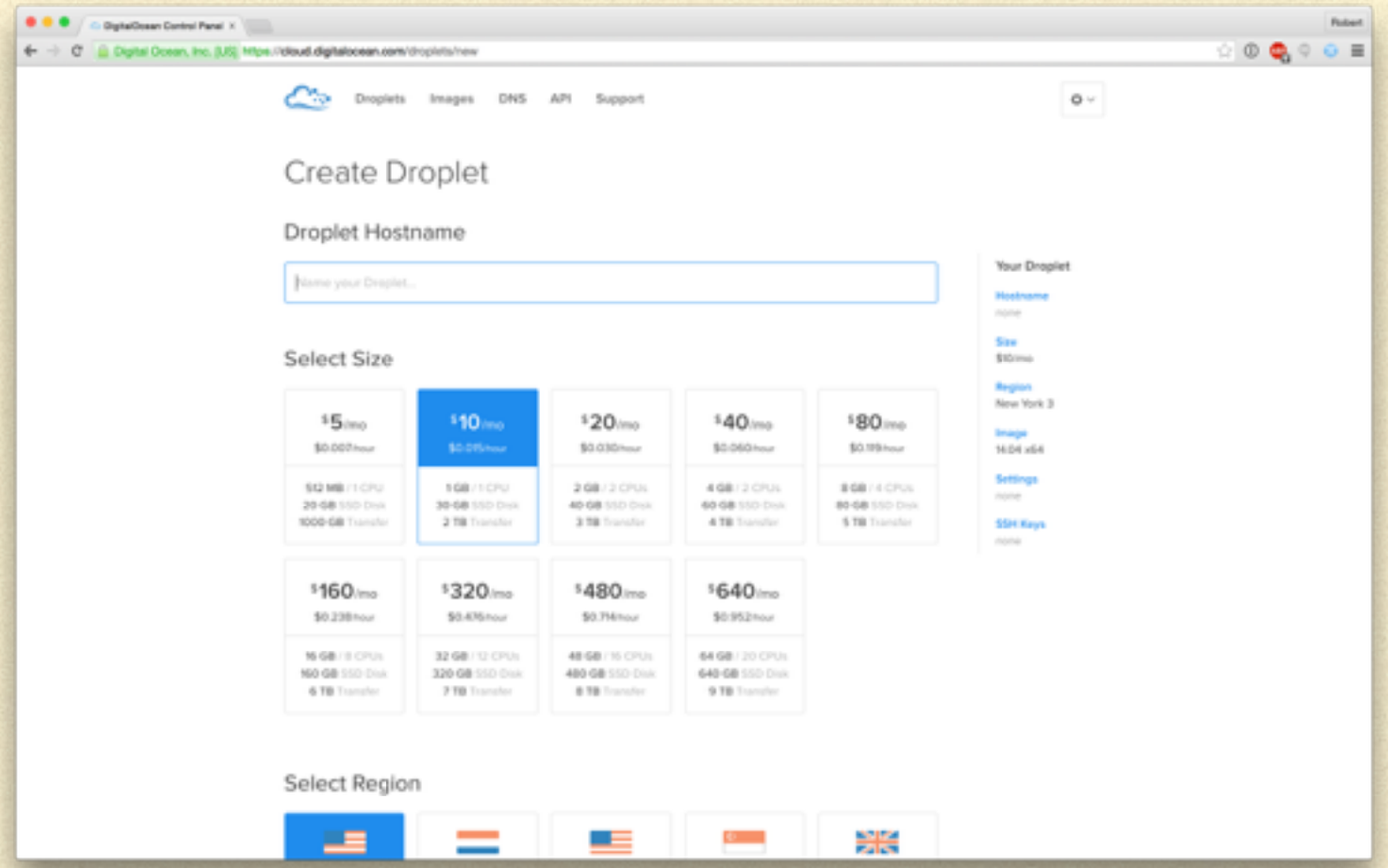
THE CRUD IN ACTION

- The "show" action for reading, should typically display a singular thing as the main attraction.



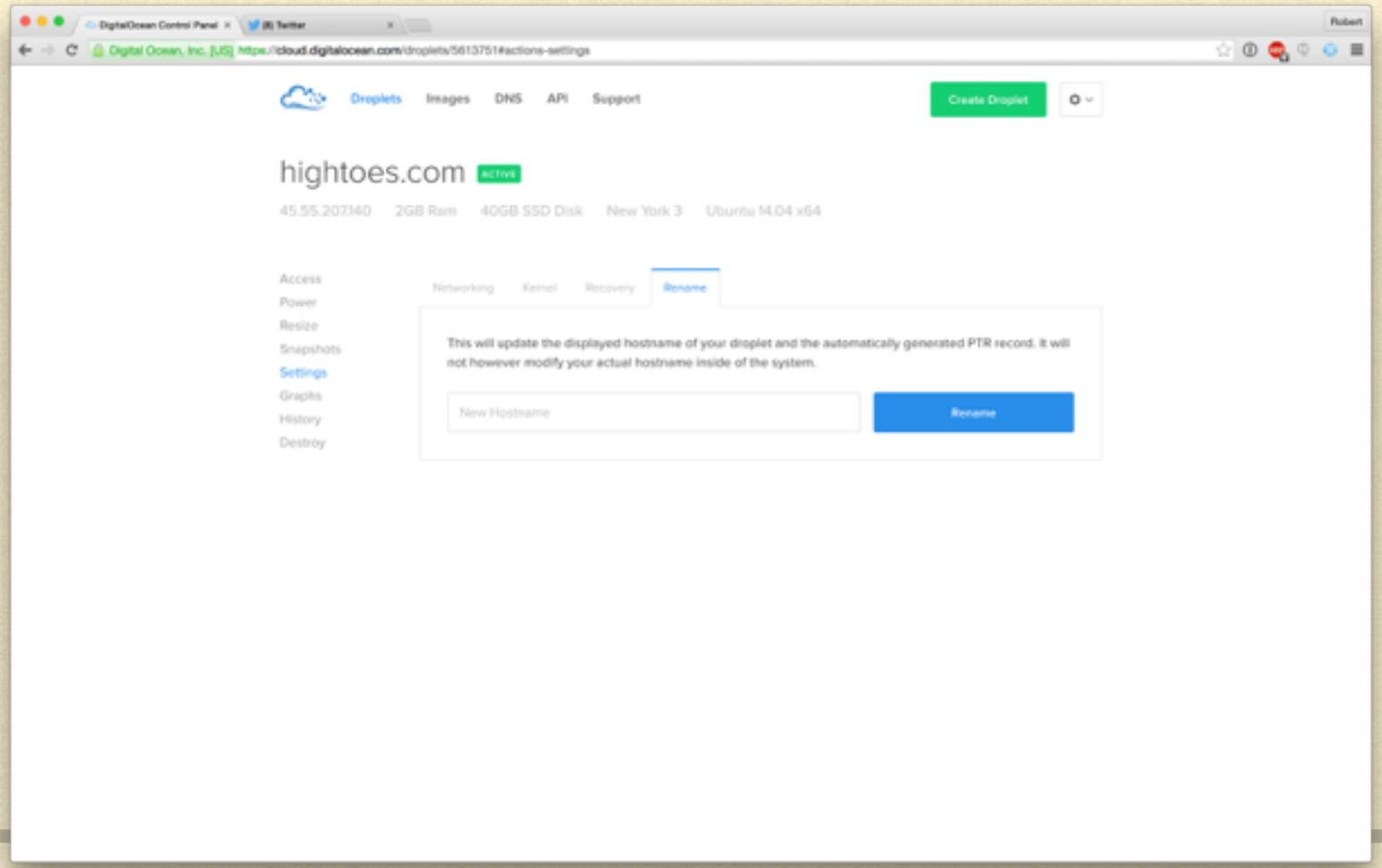
THE CRUD IN ACTION

- The "new" action for create, should typically display a form to create an object in the database. It will also usually have a "create" action.



THE CRUD IN ACTION

- The "edit" action should display a form pre-populated with information about the item being edited. It should send the user input to the "update" action on the same controller.



DYNAMIC ROUTES

- Now that we know a little bit more about actions and their individual purposes, let's talk about dynamic routing in rails.

- The gist of it is, a route can define a controller and action, but it can also pass in more information from the URL requested.

DYNAMIC ROUTES

- *"but it can also pass in more information from the URL requested."*
- Let's look at a few different URL paths:
  - /users/12345123
  - /users/15060
- Both of these URL's are different, but point to the same controller and action.
- The numbers in these URL's are the ID of the user we want detail for.

DYNAMIC ROUTES

- We can't create every single route for every single ID in our database (especially since it could grow while we're asleep).
- What I mean is:
  - get "/users/12345123" => "users#user_12345123"
- Simply makes no sense at all.

DYNAMIC ROUTES

- Instead we have what are called “placeholders” for routing.
- A placeholder starts with a colon, and is followed by a word(s) separated by underscores. It is used within the path portion of the route.
- For example:
  - `get “/users/:id” => “users#show”`
- This will match any URL that has the format:
  - `/users/{number}`
- And still go to the users controller, and show action.

DYNAMIC ROUTES

- `get "/users/:id" => "users#show"`
- When assigning a route this way, the :id portion becomes available in the params hash within our controller. For example:

users_controller.rb

```ruby
class UsersController < ApplicationController
  def show
    user_id = params[:id]
  end
end
```

DYNAMIC ROUTES

- `get "/users/:id" => "users#show"`
- So in a browser, if we make a request to "/users/12345", then:

users_controller.rb

```ruby
class UsersController < ApplicationController
  def show
    user_id = params[:id]
  end
end
```

`user_id` would be assigned as "12345" (a string)

DYNAMIC ROUTES NOTES

- Keep in mind that the route helper, "resources" will define 7 routes for you. Including the routes for specific models (show, edit, etc…)

```
        Create
POST    /photos(.:format)          photos#create
GET     /photos/new(.:format)      photos#new

Read
GET     /photos(.:format)          photos#index
GET     /photos/:id(.:format)      photos#show

Update
GET     /photos/:id/edit(.:format) photos#edit
PATCH   /photos/:id(.:format)      photos#update
PUT     /photos/:id(.:format)      photos#update

Delete
DELETE  /photos/:id(.:format)      photos#destroy
```

LAB - FLEX THEM RAILS MUSCLES

- Another day, another rails app. Getting your reps in. Work with your seat mate.

- Please create a rails app called "flickr" in your class 12 folder.
- In the rails application, please add *resourceful* routes for "photos". Hint: 7 routes.
- Generate a Photo model with a url:string and caption:string attributes
- Add controller actions and views for index, show, new, create, and delete. Seed with a few photos from the web. In the index and show views, display the photo with HTML
- Damn, look at all the stuff you already know!
- Try to do as much as possible without peeking at the last app, but it's cool if you do.

Editing

LETS ADD EDITING!!!!!

THE ROUTE

- You'll notice there's a route for the edit action in our routes for photos:
  - `GET /photos/:id/edit(.:format) photos#edit`
- This points to the edit action on our photos controller.
- The edit action is similar to the "new" action, in that it only displays a form. But slightly more.

THE CONTROLLER

- The edit action typically will fetch the item we're editing from the database using our model, and assign it an instance variable. Like so:

photos_controller.rb

```rb
class PhotosController < ApplicationController
  def edit
    @photo = Photo.find(params[:id])
  end

  def update
    # ...
  end
end
```

WHY

- Just like the "new" action our controllers have had, we need an instance of a photo to pass to our view, to render a form correctly.

- By finding a pre-existing instance of a photo from our database using the ".find()" method on our model, the form will automatically be pre-populated with the values.

- Remember, our edit action is solely to display a form. Which is pre-populated.

UPDATING A MODEL OBJECT

- Models can be updated several ways, but the easiest way is use the “update” method on an instance of a model that has already been saved.

- For example:

  - `photo = Photo.find(123)`

  - `photo.update(url: “flickr.com/newfile.png”, caption: “whut”)`

- Notice that we are passing in something like a hash?

UPDATING A MODEL OBJECT

- We can reuse `safe_photo_params`

```
def update

  @product = Product.find(params[:id])
  @product.update(safe_product_params)

  flash[:notice] = "Product updated!"
  redirect_to products_path

end
```

THE FORM

- The form is basically identical to the "new" form we learned a week ago. With one change: the submit button text that we don't really need to begin with.

edit.html.erb

```
1  <%= form_for @photo do |form| %>
2    <p>
3      Filename:
4      <%= form.text_field :filename %>
5    </p>
6
7    <p>
8      Caption:
9      <%= form.text_field :caption %>
10   </p>
11
12   <%= form.submit "Update Photo!" %>
13 <% end %>
```

NOTICE HOW THAT FORM IS EXACTLY THE SAME AS THE FORM IN NEW?

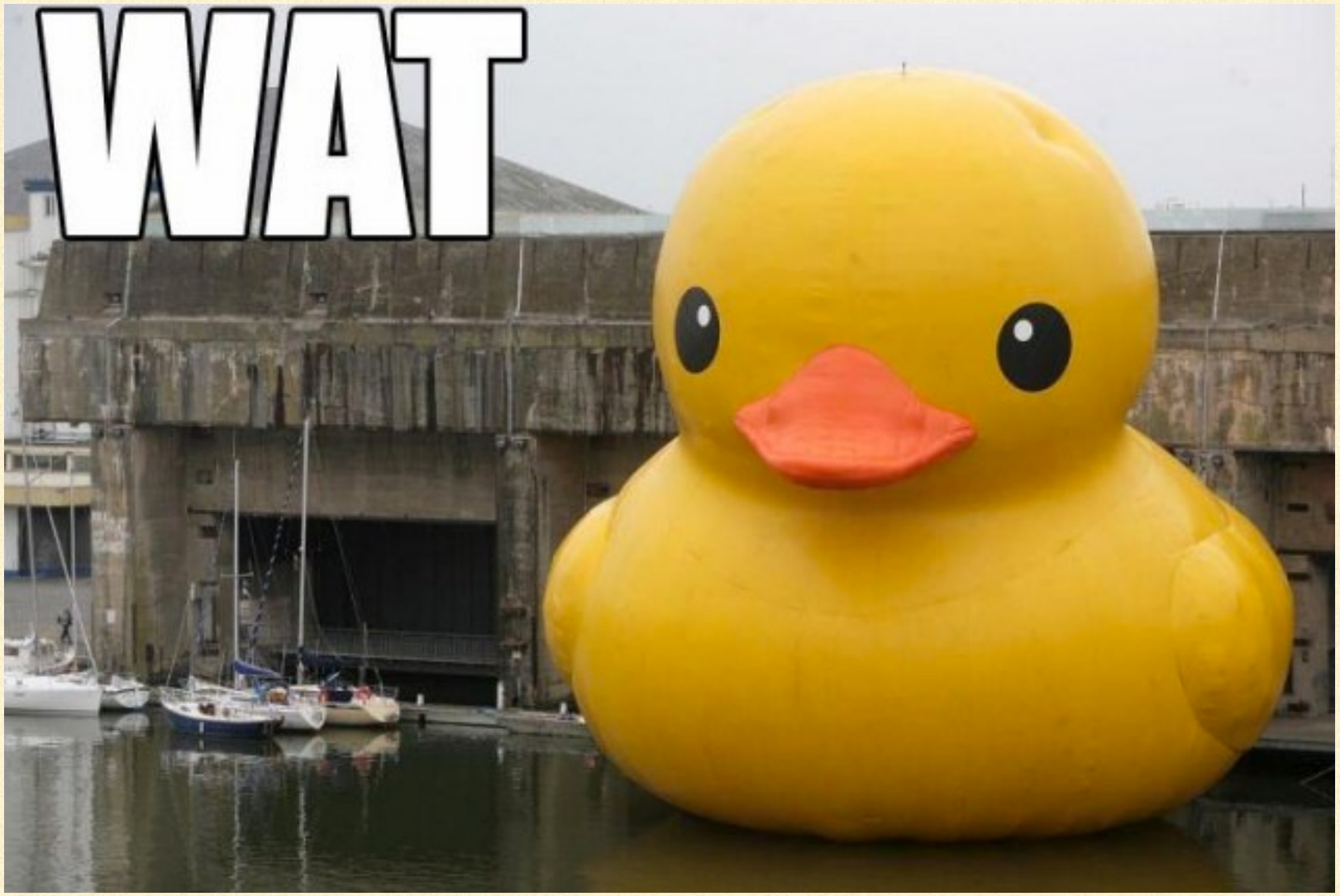
DRY (DON'T REPEAT YOURSELF)

- Programmers hate repeating themselves.
- Not-DRY code is bad, error prone and hard to maintain. Whenever you see repetition, consider refactoring.
- The form in edit and new is the same damn thing. When you have views like this, you can extract it into a *partial*.

PARTIALS

- You can render a view inside a view.
- Prepend an undersore(_) to a view to make it a partial.
- Paste the form code into `app/views/photos/_form.html.erb`
- In edit and new.html.erb, just put `<%= render 'form' %>`

BREAK



MODEL VALIDATIONS

- A model validation is to ensure data integrity before it is saved to your database.

- They are defined on the model's class (So app/models/_____.rb)

- Rails comes with many built-in validations, however you can add your own as well. Although, you likely won't need to do this for simple projects initially.

MODEL VALIDATIONS

- Model validations are ran before anything is created, or updated in your database.
- Think of it this way:
  - A user types in an email that is not a valid format when registering an account.
  - When you go to save the new user in your database, your model will validate the format of the email passed in.
  - If the validation fails, ActiveRecord will not allow the record to be persisted (inserted) into the database and will report the errors.

LAB

- In the flickger application, we're going to add a new model: User
- ***Generate*** a model called User
- On the model, add the follow attributes: email, name
- Skim http://guides.rubyonrails.org/active_record_validations.html to find how you might make sure that you can't create two Users with one email.
- Add the all dat CRUD for the user model
  - This means, you should be able to create, view a list of users, and edit a user.

MORE REAL WORLD EXAMPLES

- Checking to see if a value is "numeric"
- Checking the length of something (password for example)
- Confirmation (making sure someone types in the same thing in 2 fields correctly, again… passwords).
- http://guides.rubyonrails.org/active_record_validations.html has all of the built-in validations

SO WHERE DO WE ADD VALIDATIONS?

- Great question!

- Let's take a look at a model called "User" and add a validation for checking the length of the name!

- In your Photo app, generate a User model with

PRESENCE VALIDATION ON A MODEL EXAMPLE

GIVEN A MODEL “USER” AT APP/MODELS/USER.RB

user.rb

```ruby
class User < ActiveRecord::Base
  # Adds a validation checking to see if the name is "present",
  # meaning that is not nil, or an empty string.
  validates :name, presence: true
end
```

The attribute name that we want to validate

The validation we want to perform on this attribute before saves / updates

RESULTS

- So when we instantiate a version of this model with a blank name attribute (nil or an empty string “”)
- Attempt to save it with “.save”
- The validations will fail and nothing will be saved to the database.
- Furthermore, “.save” will return *false*

RESULTS

user.rb

```ruby
class User < ActiveRecord::Base
  # Adds a validation checking to see if the name is "present",
  # meaning that is not nil, or an empty string.
  validates :name, presence: true
end
```

example.rb

```ruby
abc = User.new(name: "")

did_it_save = abc.save
puts "Did it save?: #{did_it_save}"
# => Prints out "Did it save?: false"
# At this point, the variable "did_it_save" is set to false
```

Returns false

COMMON USAGE IN A CONTROLLER

- Model validations are commonly "used" from the controller.
- Remember, the controller accepts data from forms and saves the data using a model.
- So when you assign the validations on a model, the controller doesn't need to define them, it simply needs to call "save" on the model instance and check to see if it returned true or false.
- Code on next slide…

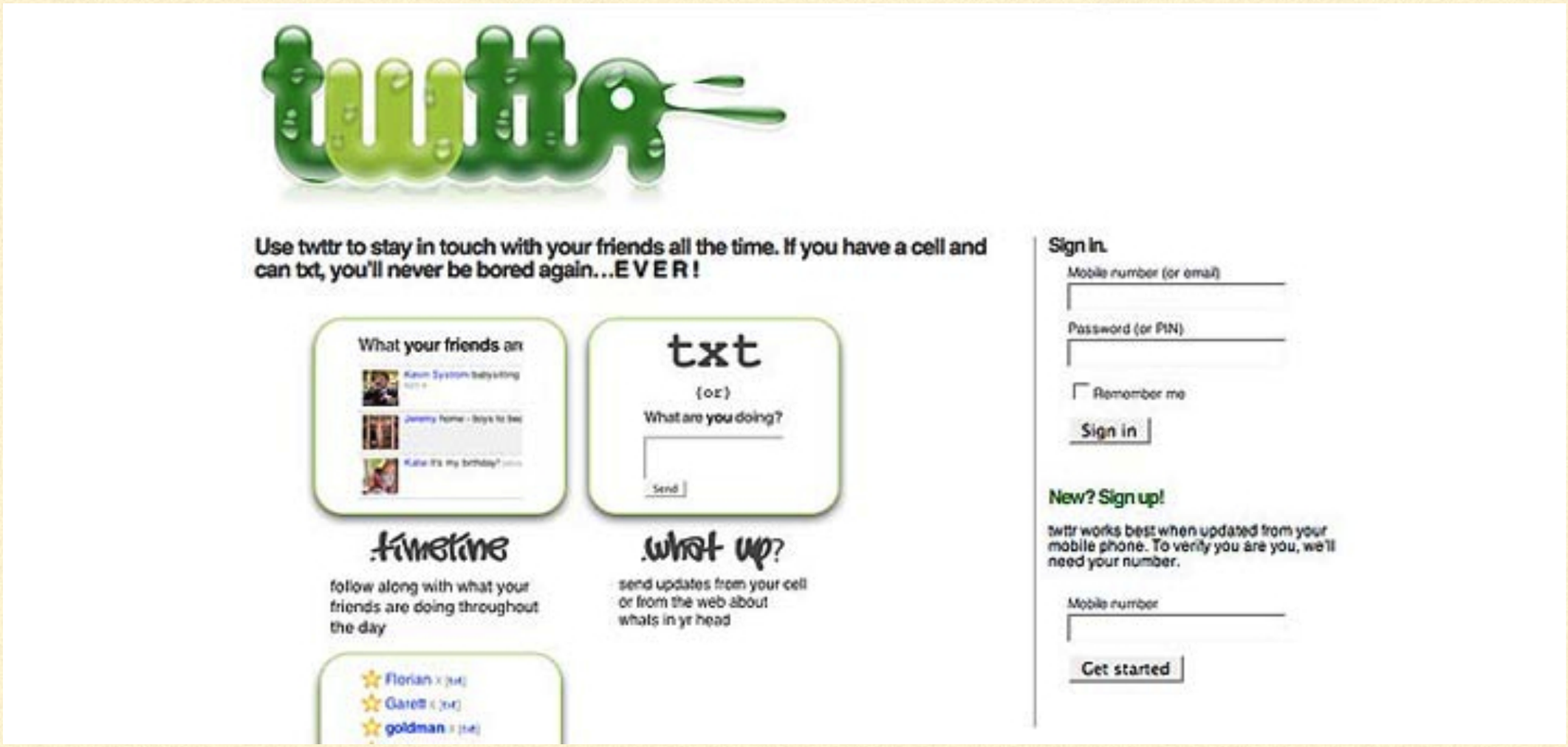
users_controller.rb

```ruby
# app/controllers/users_controller.rb
class UsersController < ApplicationController
  # assume the 'new' action is also defined

  def create
    @user = User.new(user_params)

    # calling "save" will automatically run validations on your model.
    # rails handles that for you (rails magic!)
    # if any of the validations fail, this if statement will fail
    # and continue to the else
    if @user.save
      redirect_to users_path
    else
      # This will render app/views/users/new.html.erb instead of create.html.erb
      render :new
    end
  end

  private

  def user_params
    params.require(:user).permit(:name)
  end
end
```

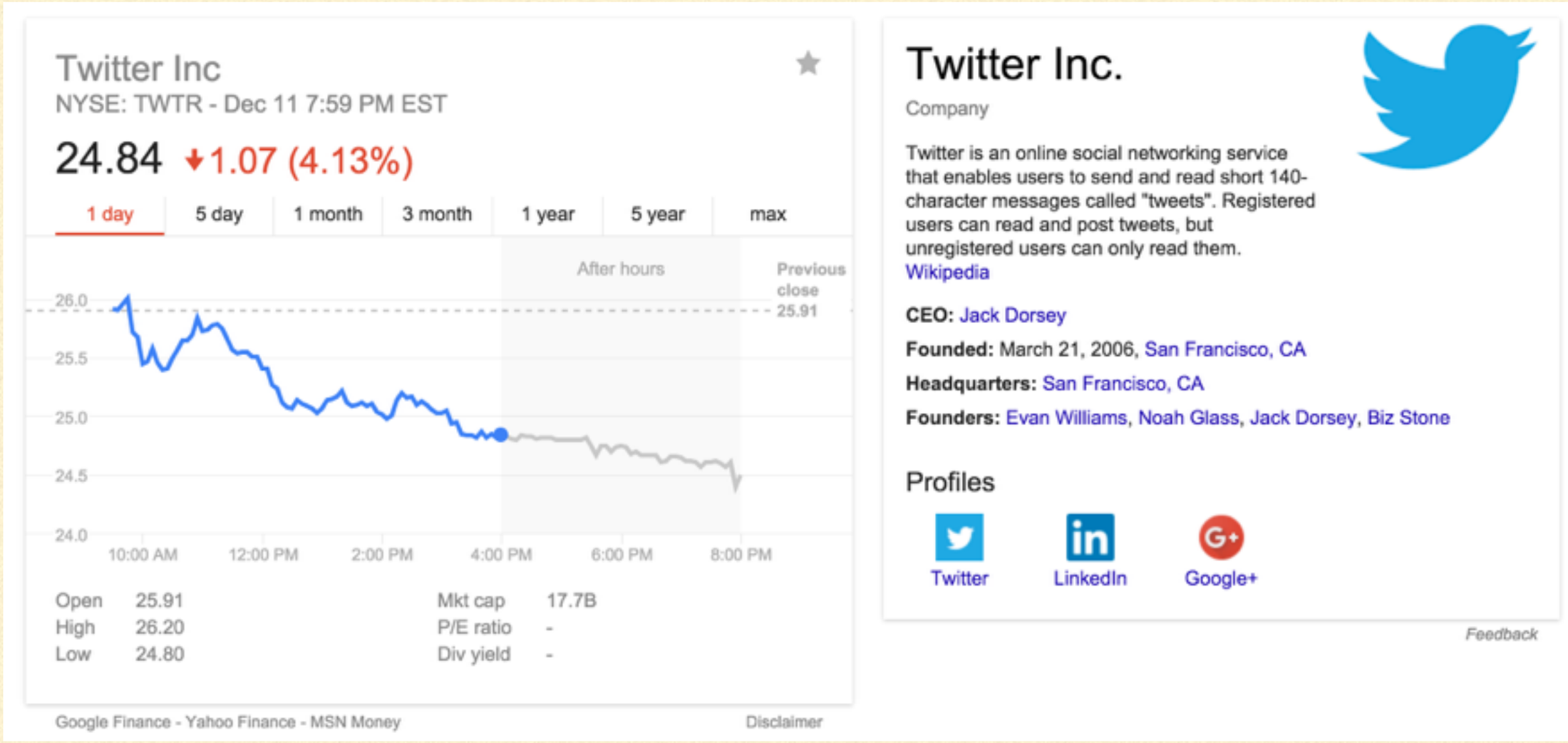
ASSOCIATIONS

IMAGINE YOU ARE THIS GUY

IT'S 2006, YOU ARE ABOUT TO CREATE THIS



WHICH EVENTUALLY BECOMES THIS



GRAB SOME MARKERS

WITH A PARTNER

- Draw on your desk or paper or whatever.
- Think of the models that you would need to make Twitter.
- What are some attributes of those models? Validations?
- Think of some controller actions for those objects.
- Think about how those objects relate to one another.

ASSOCIATION BETWEEN MODELS

TWITTER, FOR EXAMPLE

- Users have many tweets
- Users have many favorites
- Tweets have many Users who favorited them.
- Tweets belong to individual users
- Users are associated to other users — following

ASSOCIATIONS

- When we make resources, sometimes they need to interact.

- For example, if we want to store the user who wrote a tweet, we could start by storing the user_name as an attribute on a story.

- Then we'd add user_email, user_nickname, etc... and it would quickly get messy

```
create_table "tweets", force: true do |t|
  t.string :user_name
  t.string :user_email
  t.string :user_nickname
...
end
```

```
create_table "tweets", force: true do |t|
  t.string :user_name
  t.string :user_email
  t.string :user_nickname
...

end
```

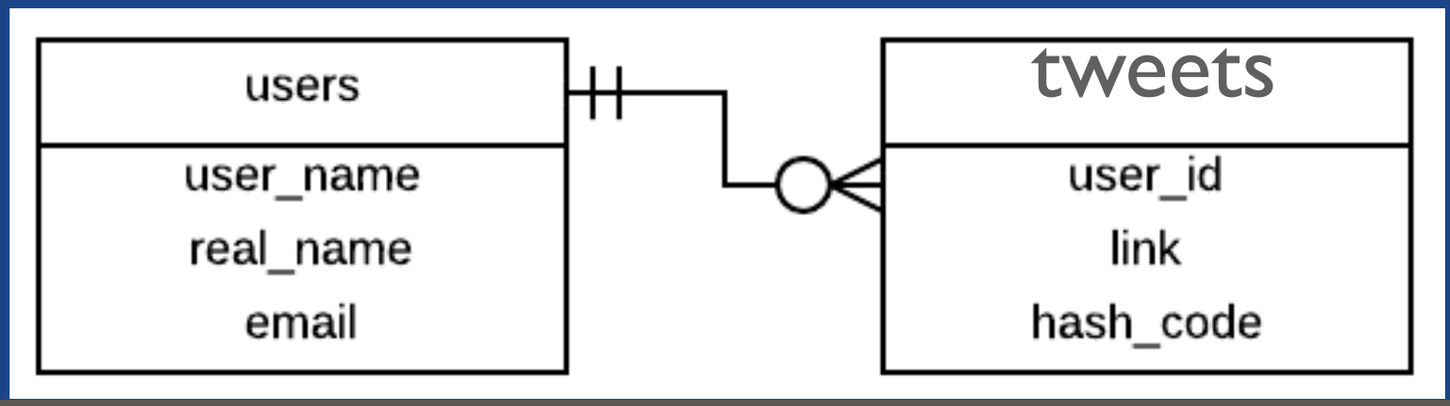
Let’s not do that ^^

We have a User model for that, so let’s leave it be.

```
create_table "users", force: true do |t|
  t.string :user_name
  t.string :real_name
  t.string :email
...

end
```

ASSOCIATIONS: CONCEPT & CODE

AN ASSOCIATION USING AN ENTITY-RELATIONSHIP DIAGRAM




```
create_table "tweets", force: true do |t|
  t.text     "link"
  t.string   "hash_code"
  t.integer  "user_id"
end

class Tweet < ActiveRecord::Base
  belongs_to :user
end

class User < ActiveRecord::Base
  has_many :tweets
end
```

The primary key is the field that uniquely identifies each row of a table. in rails, this is always the ':id'

The foreign key identifies which row of another table it is associate with ':user_id'

FLICKR APP

- We can go back to the photo model that we already have and add the foreign key for user.

- In your terminal:

- `rails g migration AddUserToPhotos user:references`

- Look at the migration, then `rake db:migrate`

ASSOCIATIONS: SIX TYPES

- **belongs_to**
- **has_many**
- **has_one**
- has_and_belongs_to_many
- has_many :through
- has_one :through

ASSOCIATING THE MODELS

- We can now associate the models. Let's tell user it has many photos

- And photos belong to users.

- This means a photo can have a user

- And users have photos.

- Let's practice in the rails console.

GOING FORWARD

- We will soon be able to show only a particular user's photos, let signed in users create heir own photos, and lots of other stuff.

LAB / HOMEWORK

- Spend a few minutes thinking about how Models might be related in your final project app.
- Run it by your favorite co-student.
- Challenge each others' assumptions
- Add this to your project proposal.

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