Models & Active Record

Week 5 / Lesson 1

Agenda

- Review
- Models
  - Databases
  - Generating Models
  - Migrations
  - seeds.rb
- Active Record
- Lab Time

Controller & Routing Logic

Finishing our review from last week

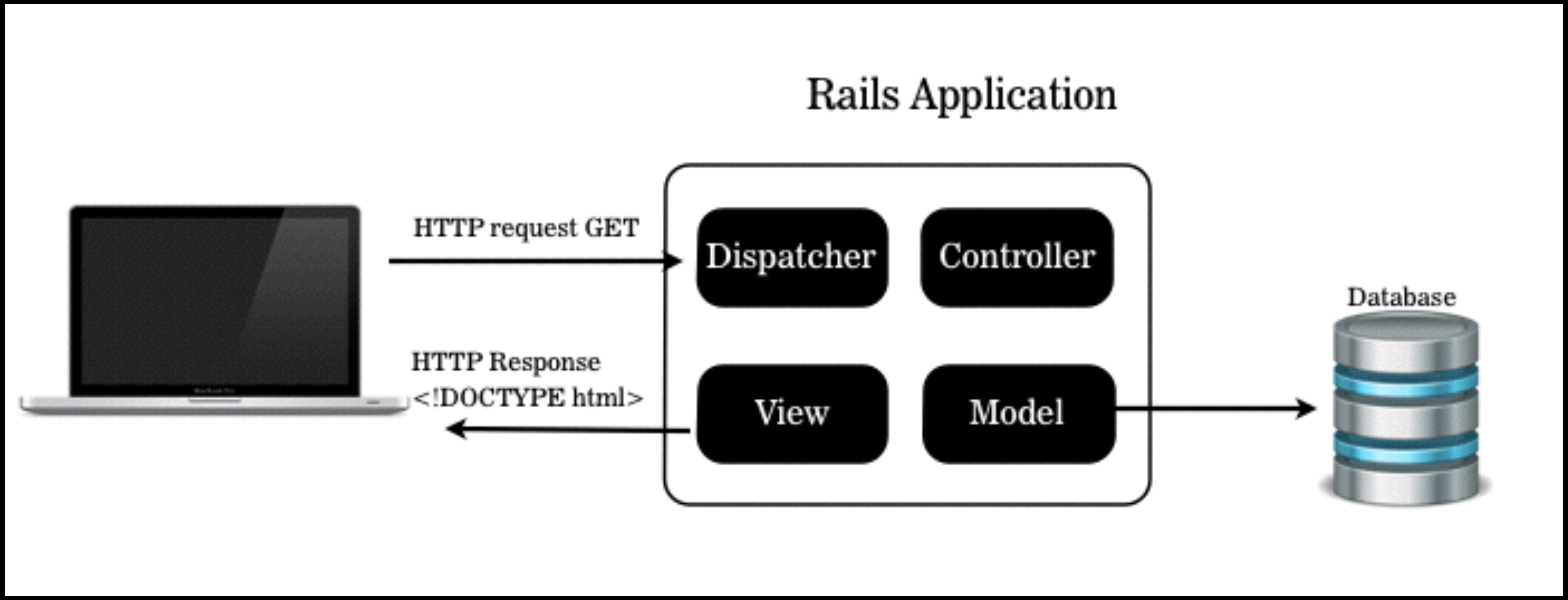
Review

Movies App

Time: 20min

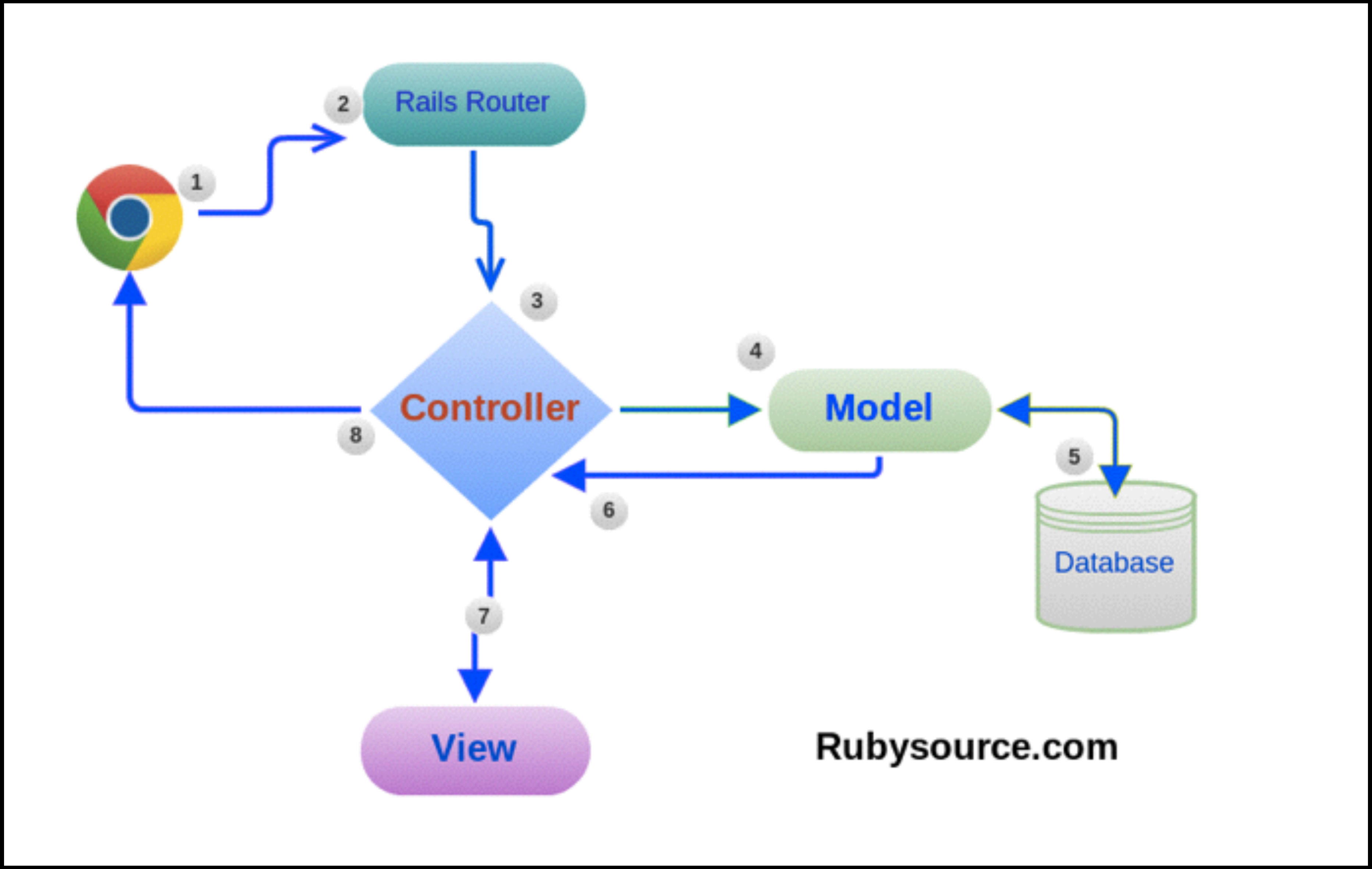
Review

Routes, Views and Controllers



Review: MVC

- The controller interacts with the Model
- The controller renders the view, passing it Model data (using instance variables)
- The view and the model do not interact (need the controller)



Models

Talking to the database

- They talk to database
- We need to use the database to store persistent data (lives beyond a request lifecycle)
- Models simplify the task of working with a database
- Each model is used to talk to a specific table (e.g. User model for Users table)
- Rails models have special functionality to allow you to easily lookup data from the table, or make changes without having to use SQL directly*

Database

Permanent Data

- Permanent store for data (lives beyond a single request)
- Designed to handle data at scale (lots of data)
- Many different databases we can choose from, Rails handles almost all of them.

Database

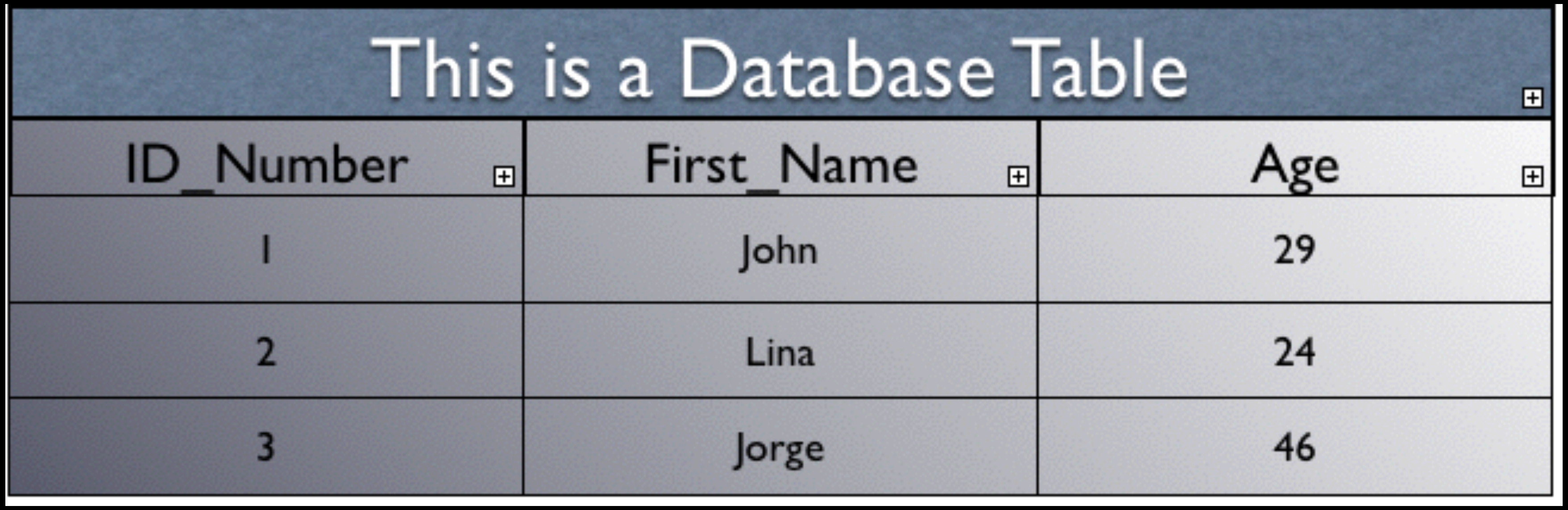
Standard data types

- Text
- Numbers
- Dates / Times
- Booleans

Database

Tables

Table: A database is made up of a collection of tables. Example below is a list of Employees.



This is a Database Table

ID_Number	First_Name	Age
1	John	29
2	Lina	24
3	Jorge	46

Database

SQL

SQL: Structured Query Language A programming language used to search and save data to databases.

```
SELECT "movies".* FROM "movies" WHERE "movies"."title" =
'Jaws' LIMIT 1
```

Model

Code Along: Shirts

Shirt Management app is an application we will build incrementally during class.

The app allows users to manage their T-Shirts collection, by adding and deleting shirts to the database.

For this lesson we will add a basic T-Shirt Model. (name + description)

Shirt Management

Let's Add a T-Shirt Model...

</> CODE DEMO

Recap

Create a new model

```
rails g model Shirt name:string description:text
```

Recap

Rake

```
rake db:migrate
```

Recap

Rake

- Task runner for ruby
- Used to:
  - Run Migrations
  - Seed your database

Shirt Management

- Add image field to database (we will create the view next class)
- Run seeds file

</> CODE DEMO

Recap

Migration

```
# defaults
class AddRatingToMovies < ActiveRecord::Migration
    def change
        add_column :movies, :rating, :integer, default: 3
end


end
```

Recap

Migration

- Can add fields / columns to existing tables

```
# shortcut Syntax
    rails g migration AddImageToShirts image:string
```

Migrations

What can you do in a migration?

- Adding/removing columns from a table
- Modifying columns on a table
- Adding/removing tables

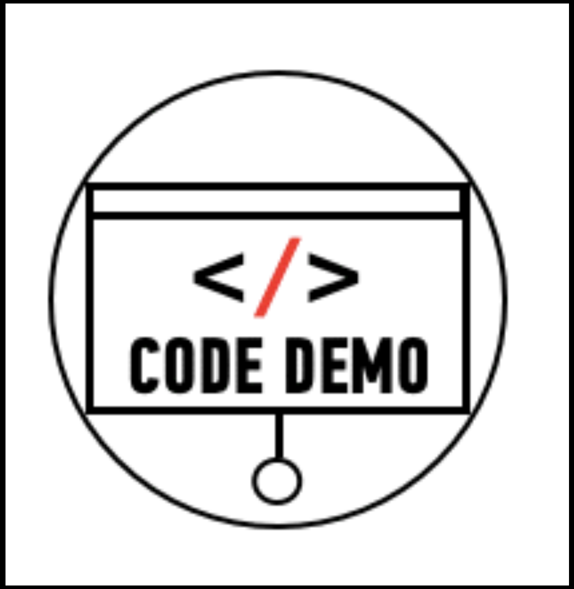
Recap

Seeds

- Fast and easy way to add data to your tables
- Place a seeds.rb file into your db/ folder
- Run:
    - `rake db:seeds`

Shirt Management

- Rails Console & Active Record
- CRUD



RECAP: Active Record

Create

```
Shirt.create(name: "White Tee")
```

Read

```
Shirt.find_by name: "White Tee"
```

Update

```
my_shirt = Shirt.find_by name: "White Tee"
my_shirt.update description: "GA white T-Shirt"
```

Delete

```
my_shirt = Shirt.find_by name: "White Tee"
my_shirt.destroy
```

RECAP: Active Record

- Rails has a library called ActiveRecord to help Models talk to the database.
- Thus, Rails models are called ActiveRecord models.
- While ActiveRecord makes it easy to avoid SQL almost entirely, it's still valuable to know some SQL. Later in your development path, you will want to know which queries are more/less efficient so you can optimize them.
- For now though, we can enjoy the super-simple syntax of ActiveRecord to talk to our database.

Models: Summary

- We want to store our data in a persistent manner, so we need databases.
- Communicating with databases in SQL is complex, so we use ActiveRecord models to help us.
- ActiveRecord models are just Ruby Objects, so we can call methods on them and pass them around like any other object.
- Each Model class maps to a database table

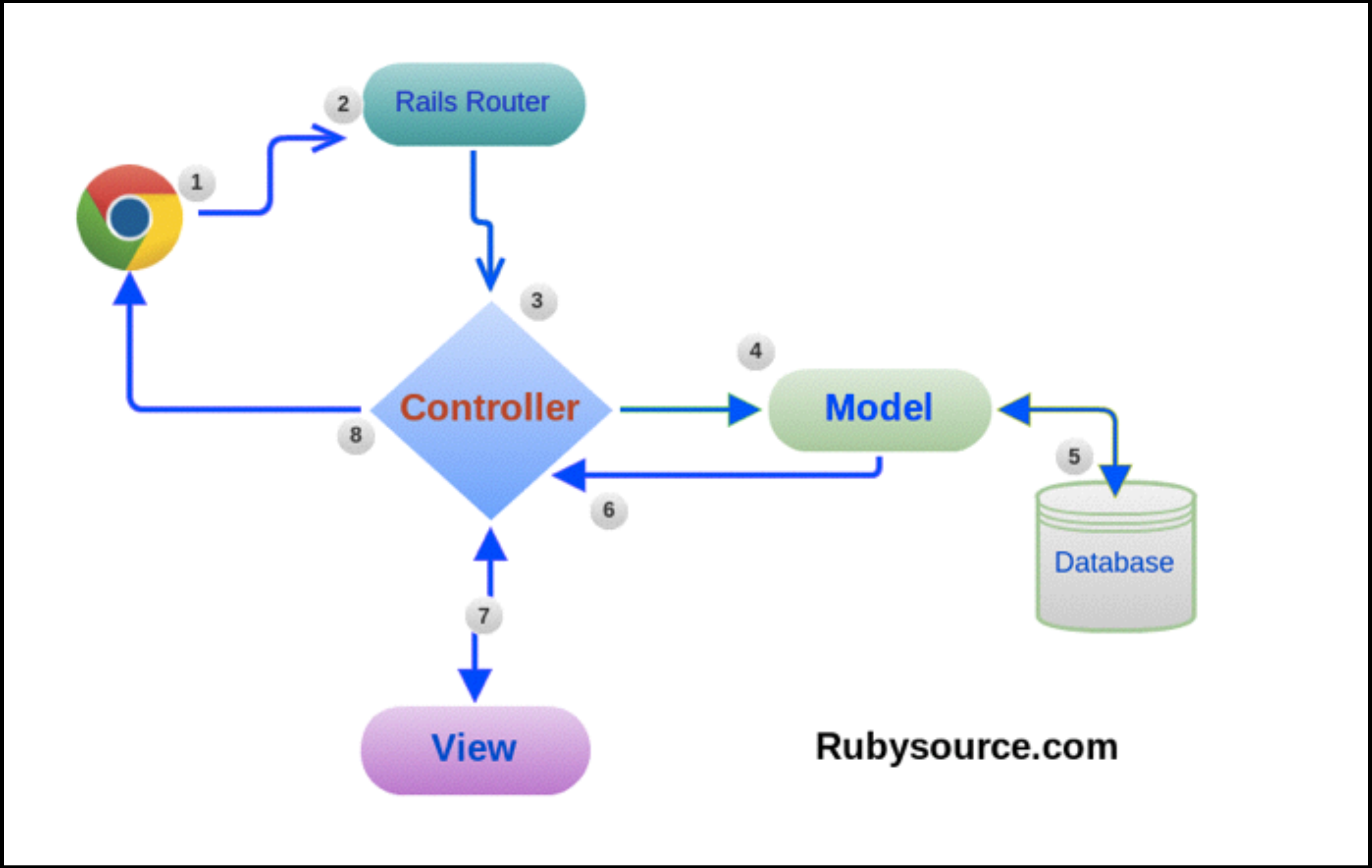
```
>> User.all
>> User.create first_name: 'Salman'
>> User.find(1)
```

- Each Model instance maps to a single record in a table in the database

```
>> user = User.find(1)
=> #<User:0x007fcf8e9eebd8>
>> user.id
=> 1
>> user.update last_name: 'Ansari'
```

MVC: Model View Controller

- The controller interacts with the Model
- The controller renders the view, passing it Model data (using instance variables)
- The view and the model do not interact (need the controller)



MVC

Controller

- Controller interacting with the model

shirts_controller.rb

```
    @shirts = Shirts.all #Returns an array of Shirts (array of
hashes)
```

MVC

Controller

- Controller intreating with the view

shirts/index.html.erb

```
#Can be used in the view
    @shirts
```

Homework

Complete and submit the Movies app - Movie Model (due lesson 11)

Let's start now.

Movie App - Movie Model

Resources: Models & Active Record

Cheat Sheet

Create Models

```
rails g model ModelName attribute_name:migration_type attribute_2:migration_type
```

- Use spaces to separate attributes. If you don't list a migration_type (text, integer, float, etc.) the default will be string.

Migrations

- Forgot an attribute / field in your model? Create a migration
  - Code below adds a field called ratings to the Movies model.

```
rails g migration AddRatingToMovies rating:integer
```

Resources: Models & Active Record
Cheat Sheet

<u>Seed Files</u>

- Populating an entire database with the console would take a while. Use the seeds.rb file.

```
rake db:seed
```

<u>Drop The Database</u>

- You will loose your data if you do this:

```
rake db:drop
```

<u>Drop database, run migrations, run seeds</u>

```
rake db:reset
```

Resources: Models & Active Record

Cheat Sheet

Active Record

Create

```
Movie.create(title: "Jaws")
```

Update

```
jaws = Movie.find_by title: "Jaws"
jaws.update description: "Big Shark, bites people"
```

Read

```
Movie.find_by title: "Jaws"
```

```
# Returns all movie objects in an array.
Movie.all
```

Delete

```
jaws.destroy
```

Still Feel Lost?

At the end of this course you should have an understanding of what databases are and the general structure of a database table (rows and columns). In addition you should be familiar with how to create, update and delete records using active record in the Rails console.

Catch Up With These Resources

Introduction to Databases w/ Geekgirls

Introduction to Database Youtube Video

Rails Guides Active Record Query

Rails Guides Validations

Rake Rake is Rails software task management tool, often used to automate moving, compiling, and deleting Ruby files

Rake executes tasks defined in rake files which describe tasks to be completed using Ruby anonymous function blocks

Introduction to using rake

User guide to rake