Design Document

High Speed Rail

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Classes

User

The model for a generic user of the system. Every user will have an entry, the only difference being which permissions each user has. These determine what a user can access within the system. A user has these attributes:

- Name - the name of the user
- Email - unique email used as the login for the user
- Password_digest - the hashed password of the user
- Remember_digest - a hash used to identify that the user wants to remain logged in.

Course

A course represents the classes that faculty teach and students are enrolled in. A course is created with the following attributes:

- code - the course code
- title - a more descriptive title for a course
- days - the days of the week that the course is held
- start_time - timestamp for the start of the course
- end_time - timestamp for the end of the course

Topic

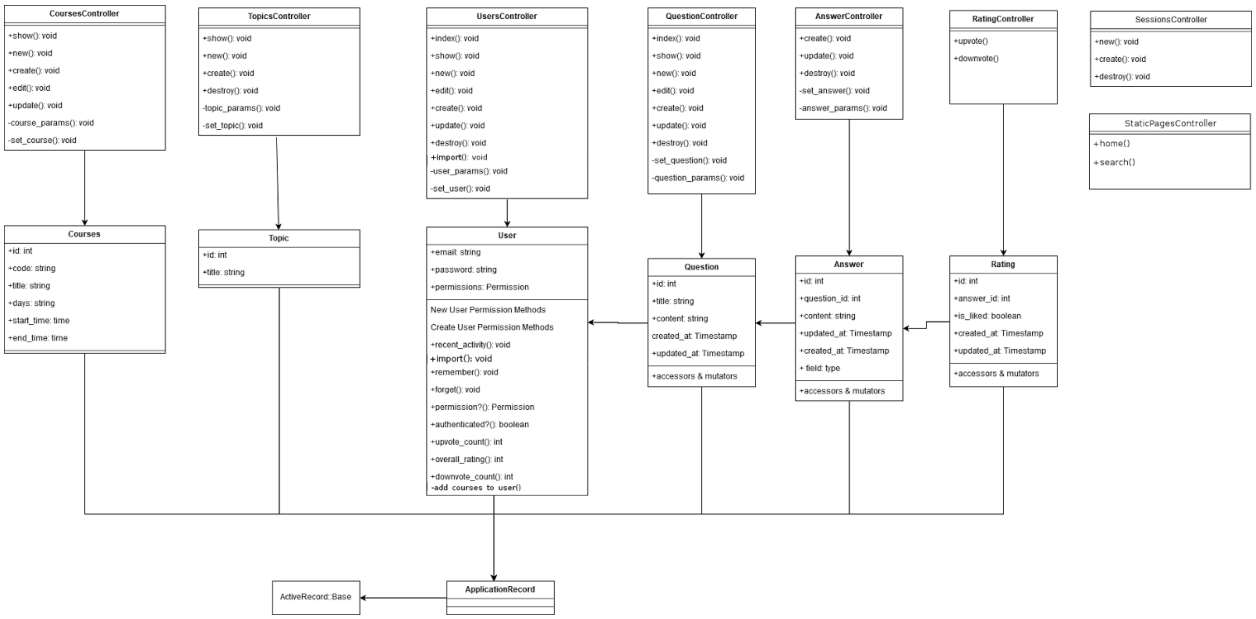
Used to group questions together. A topic will be created for each course, but other topics can be created as well. A topic has only one attribute:

- title - a short description of what the topic is.

Iteration 3

- No new classes were created for this iteration.
- Many of the goals of this iteration were purely polishes to the UI.
- For the goals that did require coding, we were able to just add on to the models and controllers that already existed.

Design Class Diagram

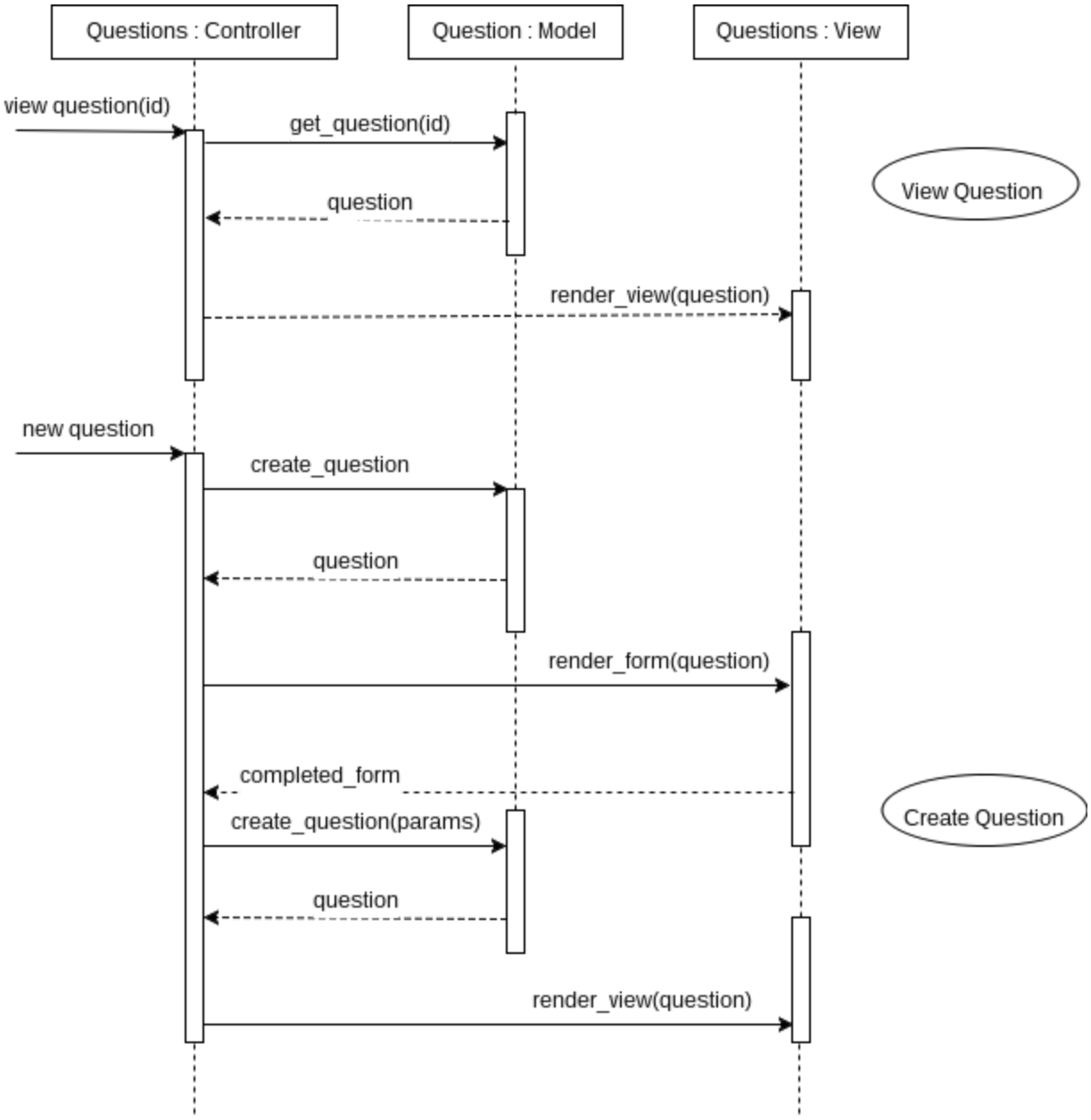


Here's an image url since this is a huge diagram: https://i.imgur.com/YtTTDkr.png

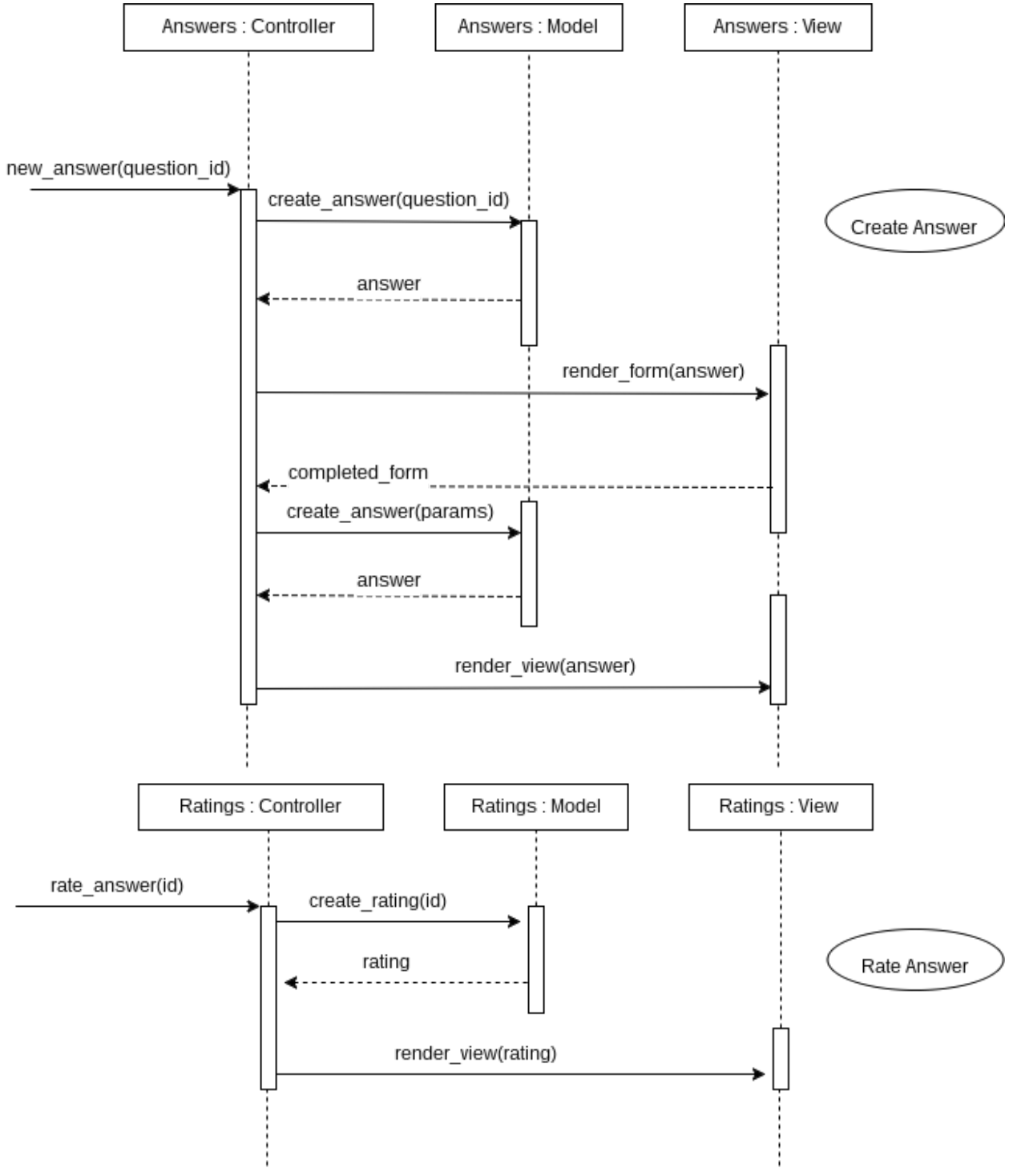
Interaction Sequence Diagrams

UC1 - View Question

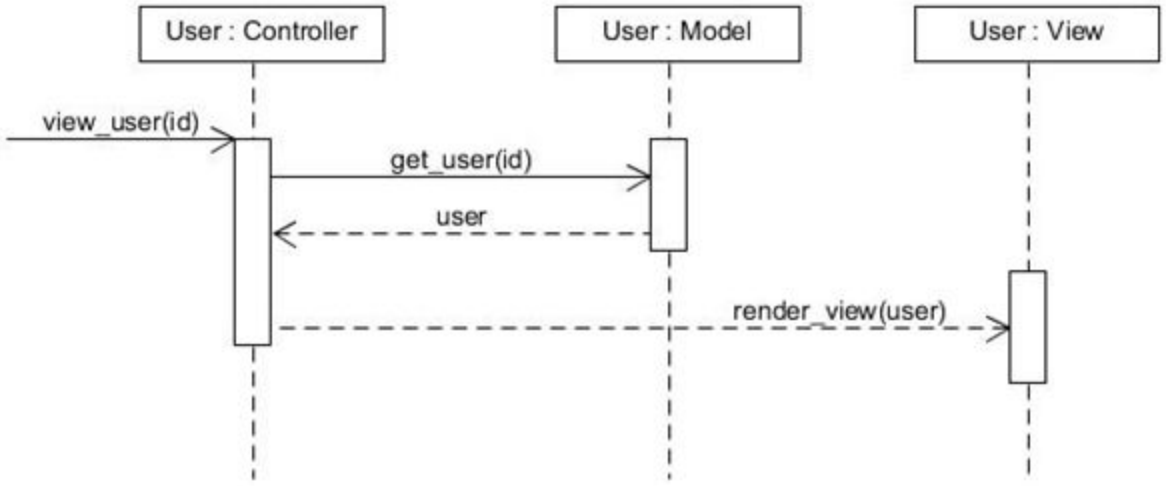
UC2 - Post Question



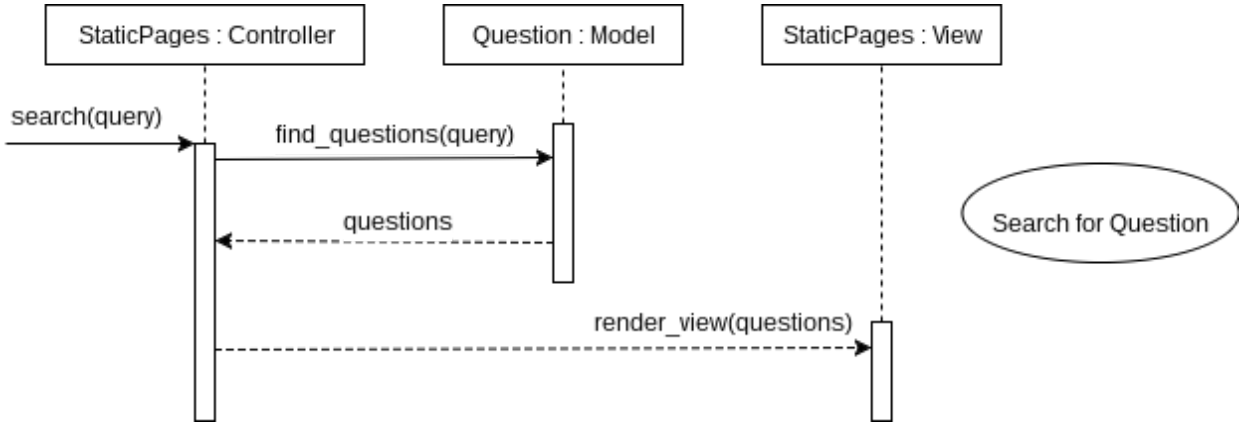
UC3 - Answer Question
UC4 - Rate Answer



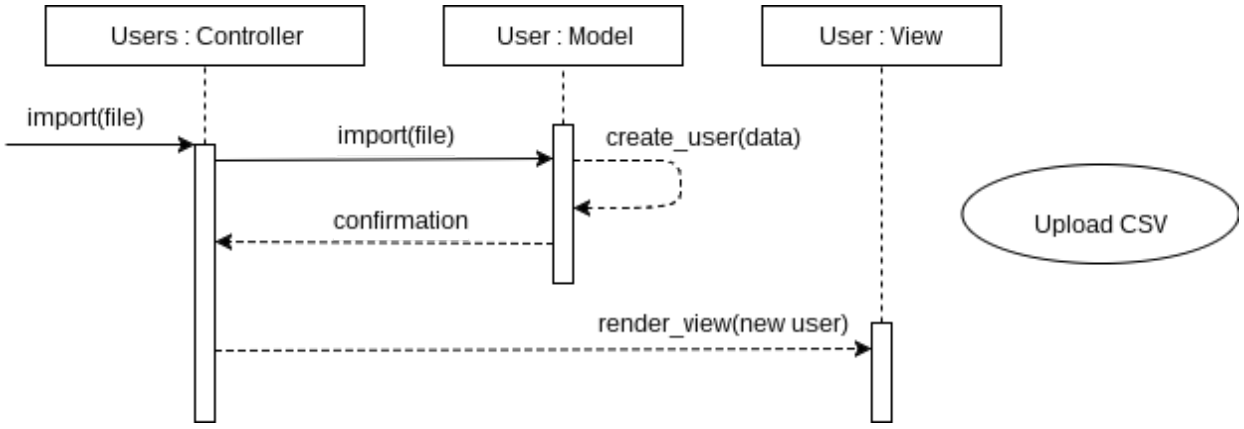
UC5 - View User



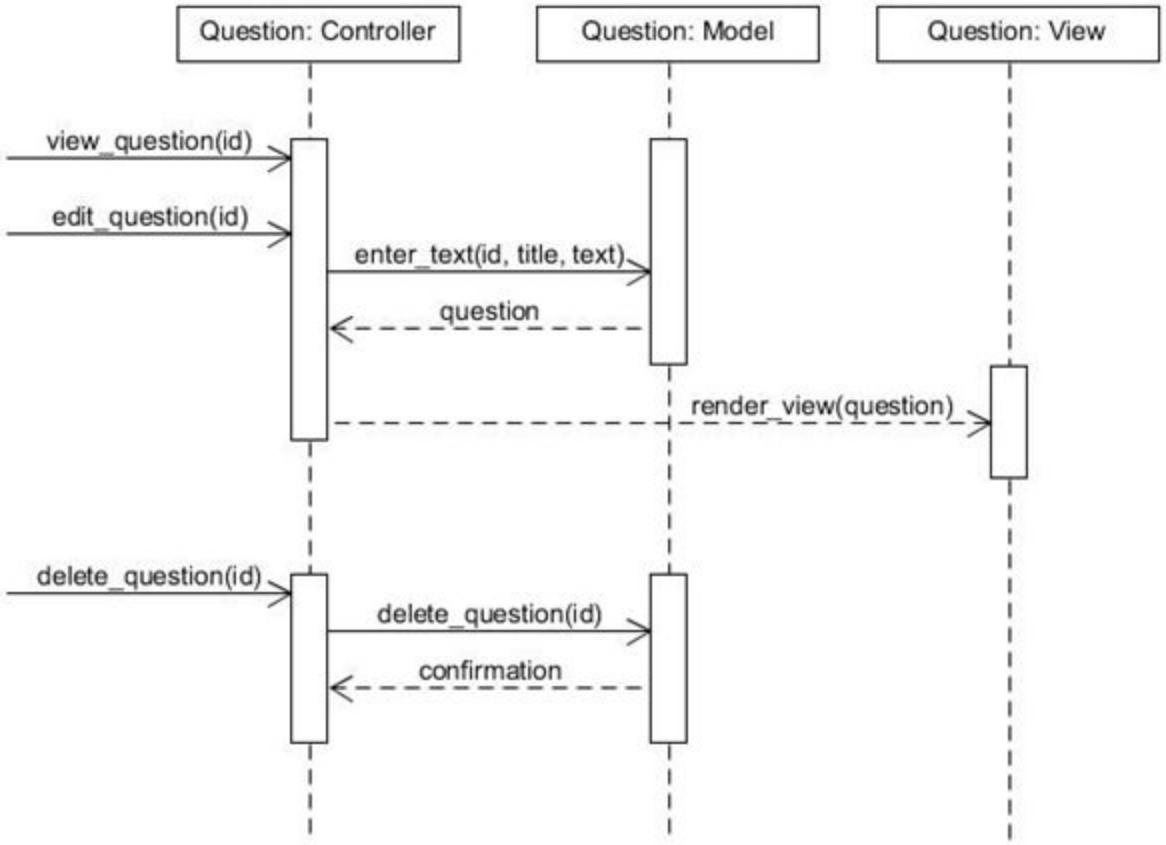
UC6 - Search for Question (Iteration 3)



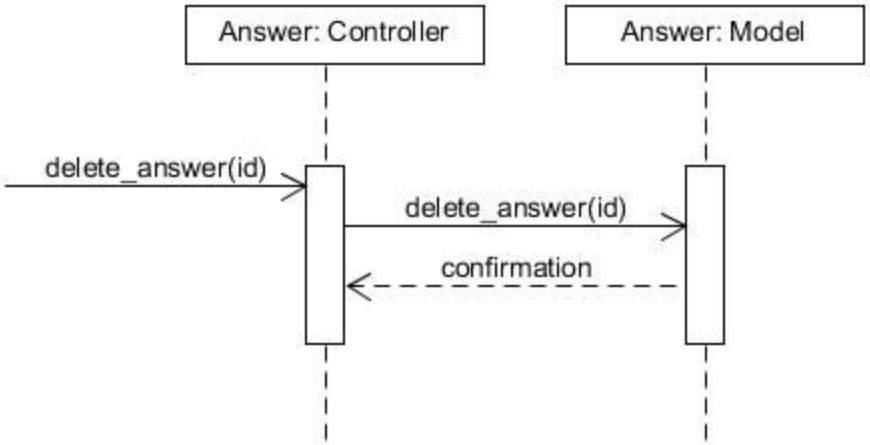
UC7 - Upload CSV (Iteration 3)



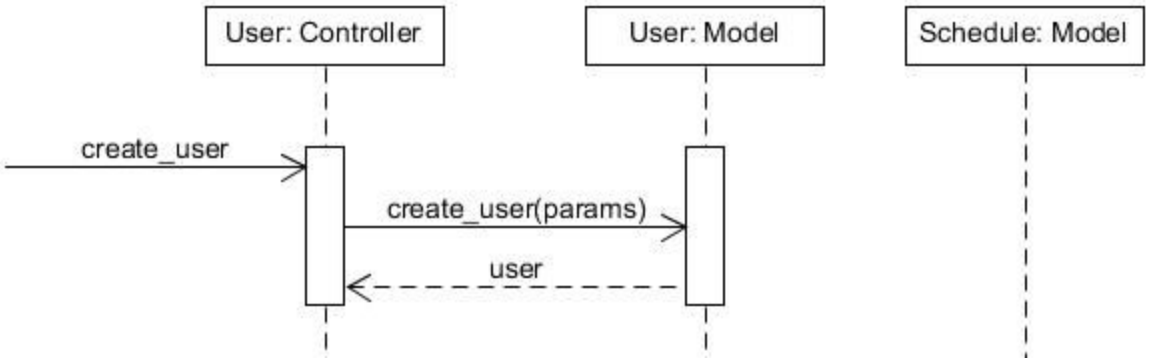
UC8 - Manage Question



UC9 - Manage Answer

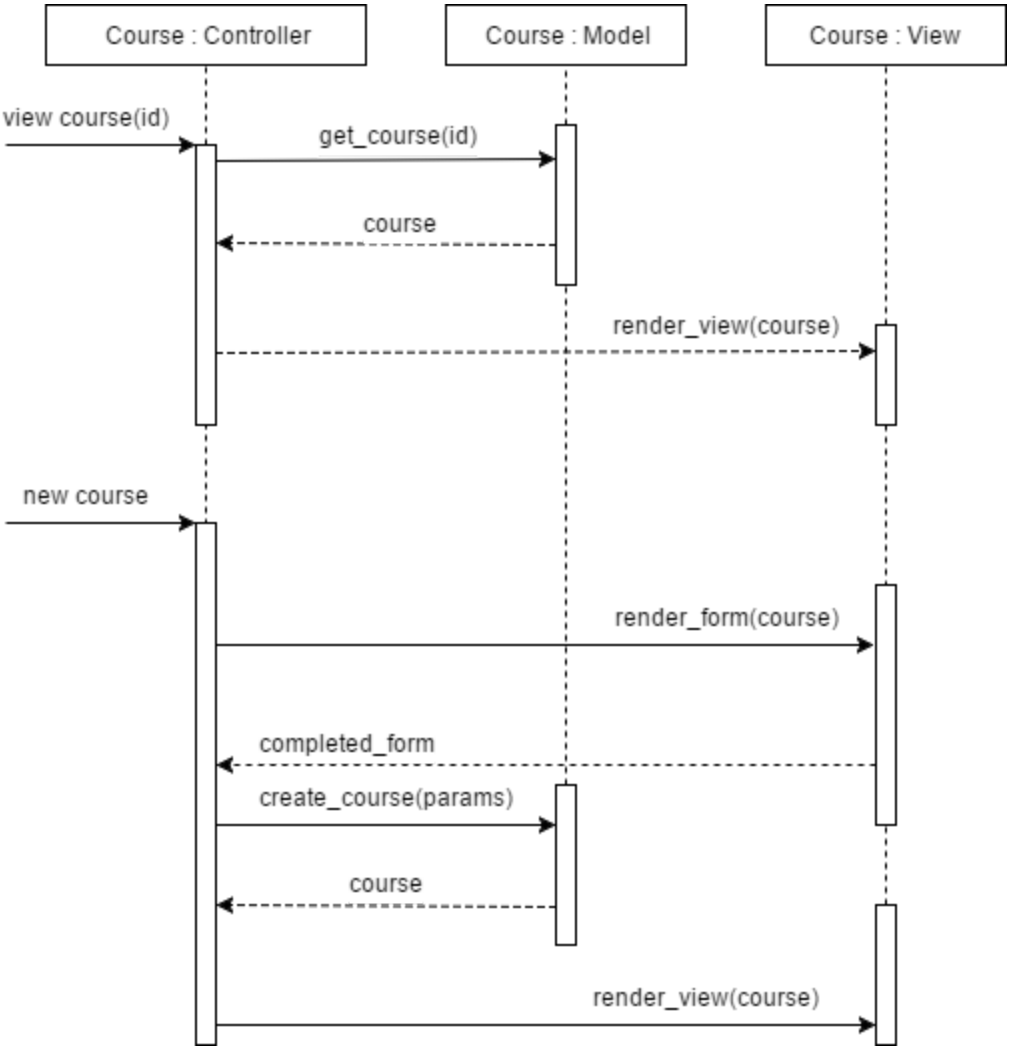


UC10 - Create User

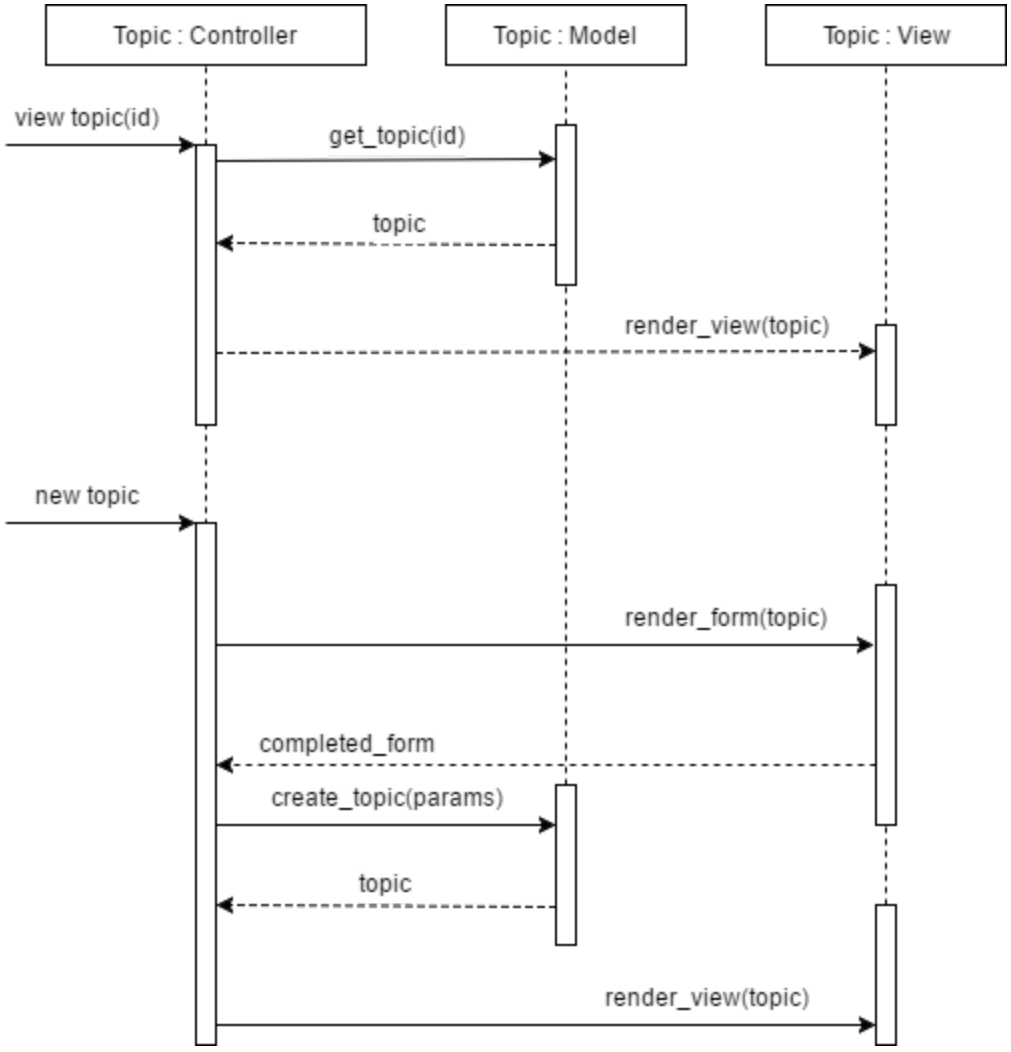


UC11 - View Course

UC12 - Create Course



UC13 - View Topic
UC14 - Create Topic



Database Design

Primary Tables:

User - Represents a generic user in our system. Currently only stores a name, email, a password digest, and remember digest as the primary columns. Through join tables, a user can have many permissions, taken courses, and taught courses.

Topic - Represents a topic that groups similar questions. Only relevant column is the name of the topic. Through foreign keys, each question is assigned to a topic.

Course - Represents a course that may have many professors and enrolled students. This table has columns that store the course code, title of the course, days of the week that the course takes place, and its start time and end time.

Permission - The permission table is basically a utility table to store the possible permissions that a user can have. The only column is the name of the permission.

Join Tables:

UserPermission - This table uniquely links a user to a permission, meaning that a user cannot have more than one of the same permissions.

EnrolledCourses - This table represents a student as enrolled in a course. Each entry is a unique combination of course id and user id.

TaughtCourses - This table links a user as the professor for a course. This enables courses to have multiple professors. Each entry is unique so that there are no duplicate relationships.

Iteration 3

No models were added in iteration 3.

Rails Console Commands (Iteration 2)

- `rails g model User content:text question:references`
- `Rails g controller Users`
- `Rails g model Course code:string title:string days:string start_time:timestamp end_time:timestamp`
- `rails g controller Courses`
- `rails g model Topic title:string`
- `rails g controller Topics`

No new commands were used in iteration 3

Security

Each user within the system has a password digest column in the database. This is a hashed and salted password using bcrypt to ensure that each user's password stays secure. The entire website has SSL enabled, so that all communication between the client and server is encrypted.

To maintain state, the system uses cookie based session management. Cookies are stored on the user's browser that contain their encrypted username and password. These cookies expire when the browser is closed. If the user wishes to remain logged into the system across browser closes, we offer an option to remember the user on that computer. This stores an encrypted cookie with a character string, which when hashed, matches a remember digest stored along with a user. This guarantees that cookies can't be forged. When a user logs out, all cookies related to sessions or remembering are cleared.

Each user has many permissions that they may be assigned. These permissions determine what the user can or can't see or do within the website. Each action checks to ensure that a user is logged in, and that the user has the correct permission to be performing that action.