Behavior Rating Tool

Project Plan

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Overview

Vision Statement

In partnership with the Atlantic Veterinary College, Dr. William Montelpare and his team presented us with the task of developing an educational video hosting platform that is both user-friendly and easy to navigate. The videos will contain footage of equines displaying a variety of behaviours that must be identified by the user in quiz format. The goal of the Equine Behavior Online Rating System is to improve equine welfare and enhance Veterinary Students' knowledge of Equine Behavior. By working through the proposed self-directed learning module, students will improve their awareness and understanding of equine behaviors within various environments. The system will provide performance scores such as number of correct behaviors identified, number of trials and time taken on task.

Scope

Equine behaviors rating system is used to enhance veterinary students' awareness and understanding of equine behavior which translates to improved welfare for teaching horses and enhanced safety for students and horses. In the future, the system can be shared with other veterinary colleges, Animal Health Technology Programs, and other stakeholders for widespread improvement in understanding equine behavior. Not only for equine study, but also can be implemented for other animal studies. System will be presented to the students as a web-based application. After student login to the system, there are a suite of short segment videos randomly distributed to students. For each video student can identify what behaviors they observed, as well as interpretation of the behavior, what action does the behavior led to. Students can review their performance scores and are then presented the options to exit the system or return to the video page and review the video clips and re-submit a new observation sheet. The video management module can be used by the professor or author to upload new videos or edit corresponding descriptors. Students' scores such as number of correct behaviors identified, number of attempts, and time spent on each task will be recorded and available to the author or admin to access. The scores are valuable in establishing the metrics associated with the implementation of the system as part of the standard curriculum for veterinary students. Student operating data will be collected and tracked such as scores, number of attempts and so on in multiple periods of time such as at the starting of the semester and again at the end of the semester. These data will be used to determine the changes for students in awareness and understanding of equine behaviors. To establish estimates of internal consistency for behavior ratings among equine experts, comparison of the frequency of correct identification of equine behaviors by the novices to the experts will help to determine if classes of errors exist.

Project Community

The project community consists of six students continuing to CS4820 as well as a professor and two clients and any personnel associated with the clients and this project. Their roles are outlined below:

- Dr. William Montelpare – Client
- Dr. Laurie McDuffee – Client
- Dr. David LeBlanc – Project Supervisor
- Amanda Isenor – Project Lead
- Christopher MacDonald – Technical Lead
- Erik Moraru – Developer
- Teng Liu – Developer
- Zak McLure – Developer
- ~~Zheyi Zheng~~ – **Transferred to Different Group**

Key Requirements

The technical requirements for this project are as follows:

Language	– PHP
Framework	– Laravel
Database Management System	– MySQL
Web Server	– Apache
Web Framework	– React
Package Managers	– Composer & npm
Version Control	– GitHub
IDE	– PhpStorm
Text Editor	– Visual Studio Code
Environment	– Docker

Operational Requirements

The key operational requirements for this project will include the best practices of documentation, security, ethics, and RESTful API. It will be important to create comprehensive and intuitive documentation at the beginning of the project and maintain that throughout the lifespan of the project to ensure the client can maintain the site on their own or with the help of others. All those who use the site will be assigned accounts and thus security is required, and the project will adhere to security standards and best practices. Given that personal data, such as name, email, and possibly student ID, is being collected, after five (5) years all records must be erased due to ethical implications. User's scores will be maintained in relation to their graduating year however, their name and all personal information will be removed. Finally, a RESTful API will be implemented to provide better flexibility of data formats.

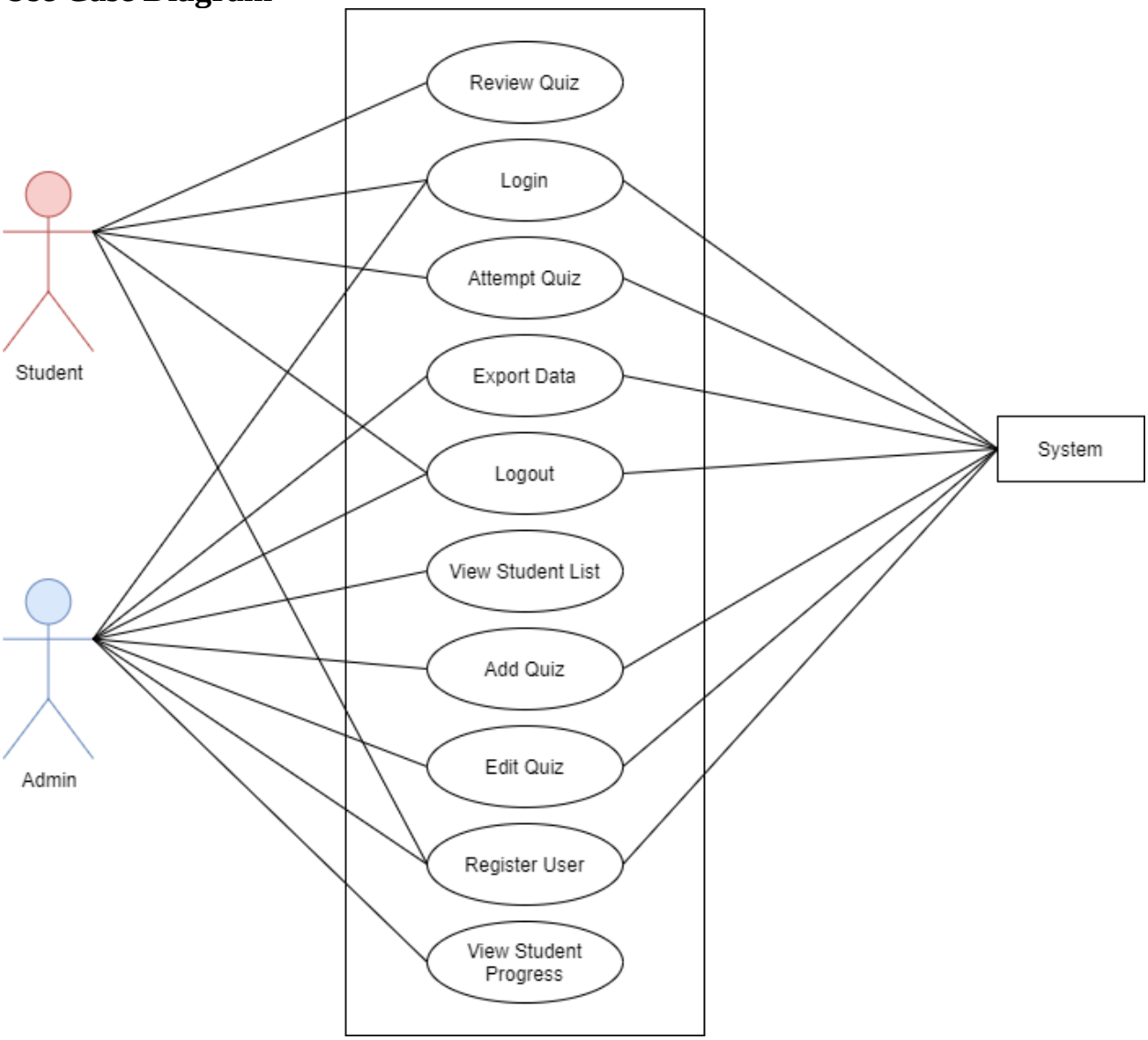
System Acceptance Tests

The client will insist on seeing the following before approving the finished product:

I. Appearance of the tool matches what is desired
II. Key functionality points are met
    a. Users can log in and out
    b. Admin can create accounts
    c. Users can take quizzes and receive feedback
    d. Users can review quizzes and scores
    e. Admin can review all user's quiz attempts
    f. Admin can export data
III. Data is displayed in a meaningful, intuitive layout
IV. The programming languages and techniques used are what was agreed upon
V. Users can only view their own scores unless they have admin credentials
VI. All system components function together without conflict, this includes frontend, backend, and database access
VII. The system passes all system tests created during development

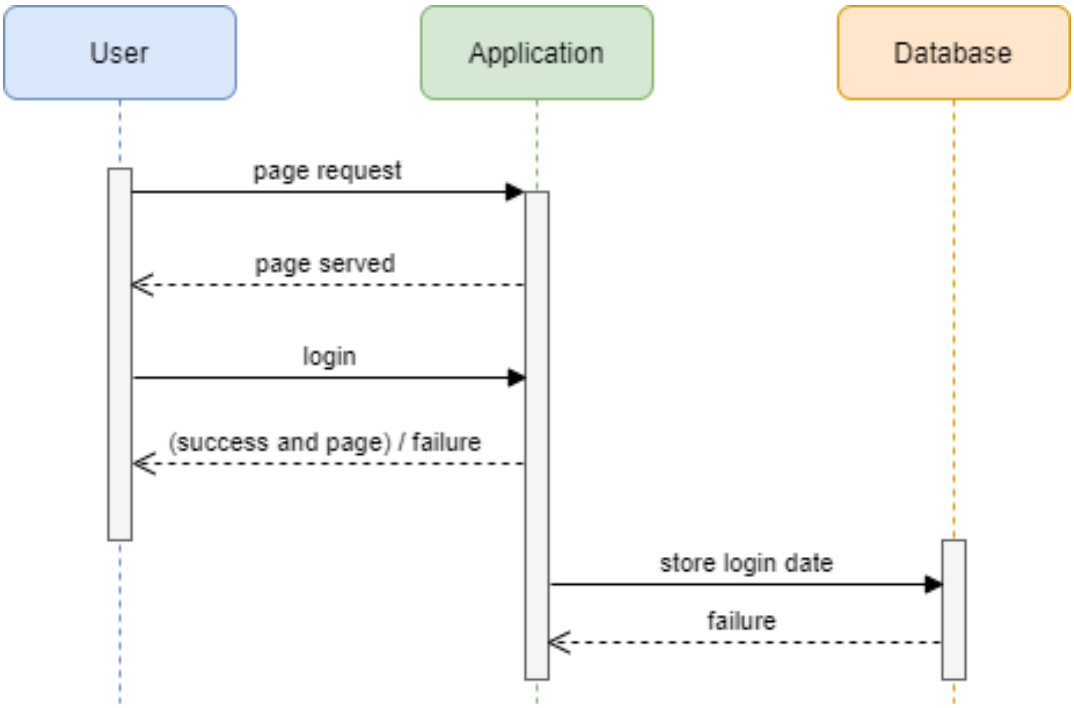
Use Cases

Use Case Diagram



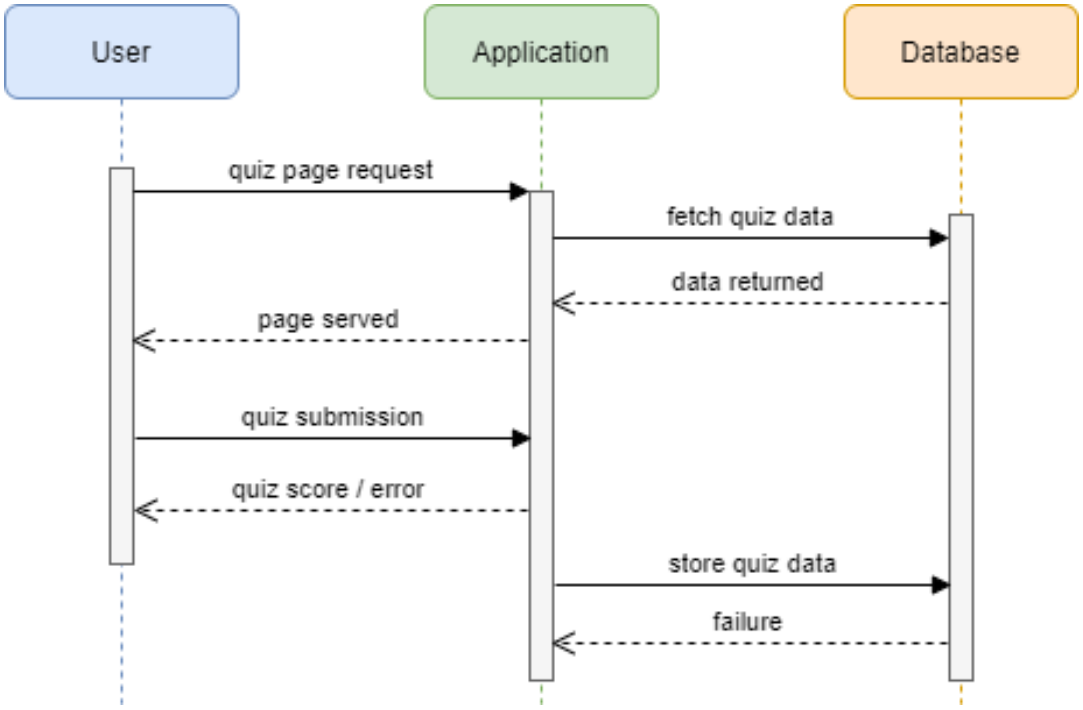
Use Case Sequence Diagrams

- **Login (User & Admin)**



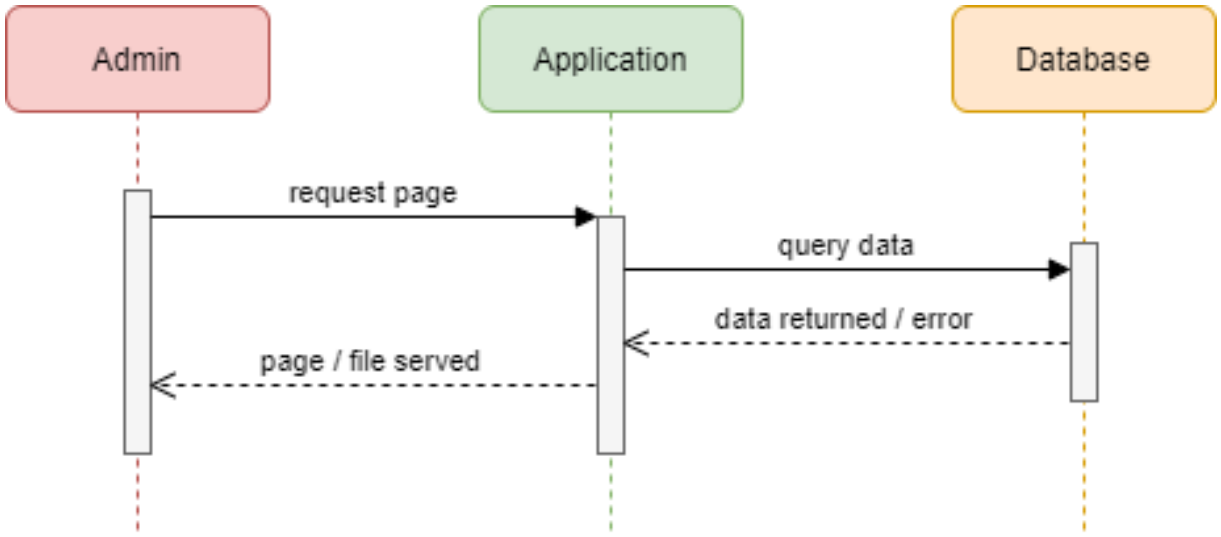
Use Case Sequence Diagrams

- **Attempt quiz**
- **Review quiz**



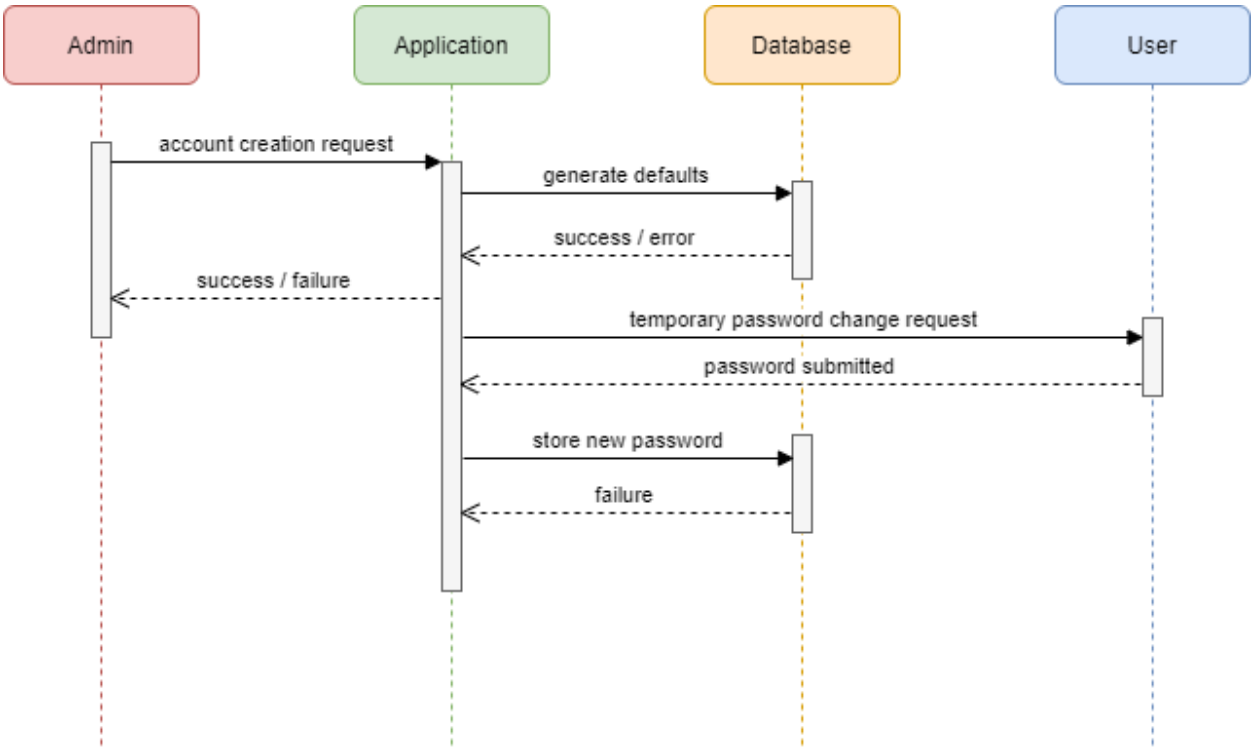
Use Case Sequence Diagrams

- **View student list**
- **Export data**
- **View student progress**



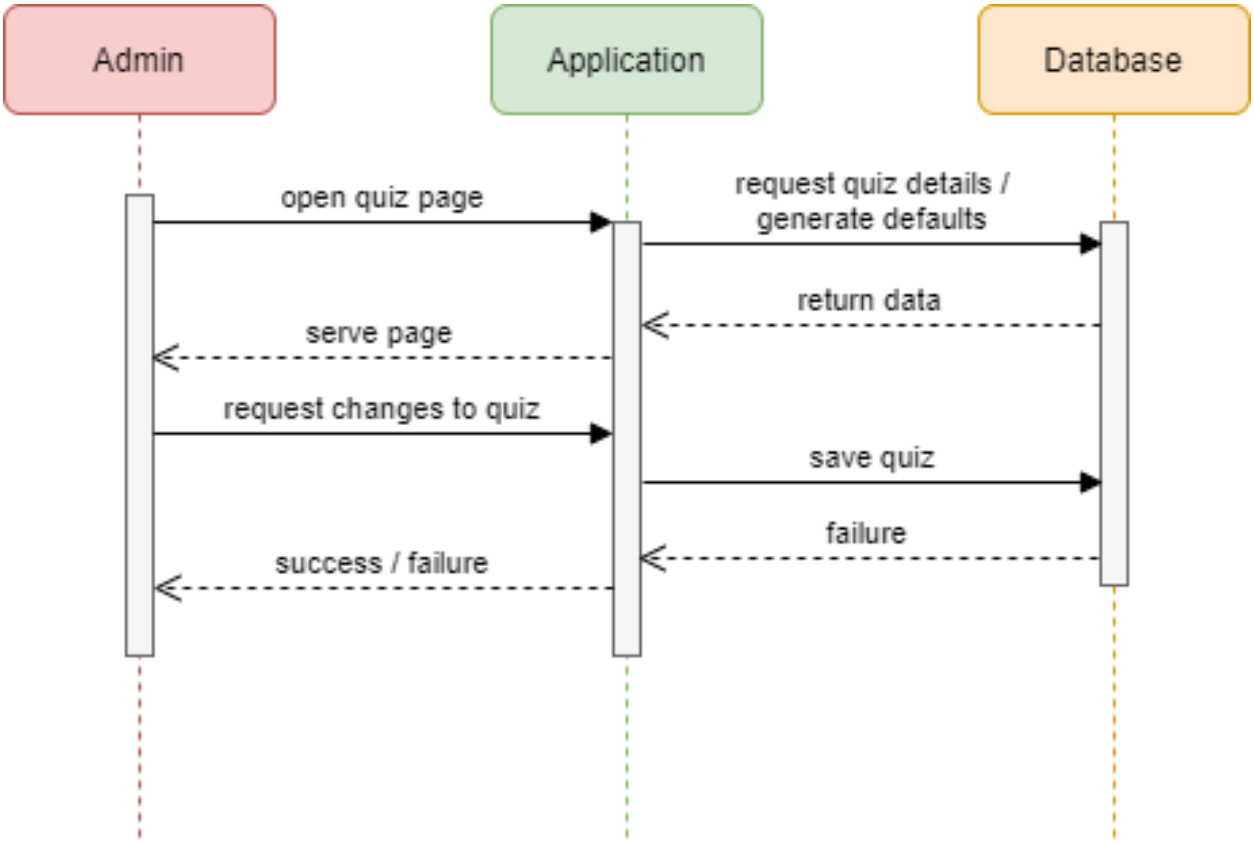
Use Case Sequence Diagrams

- **Register User**



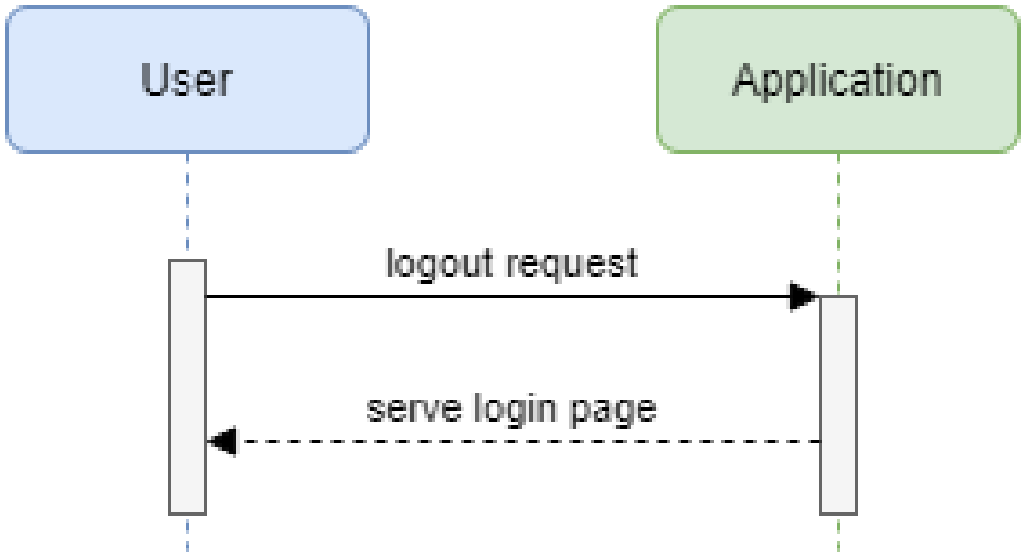
Use Case Sequence Diagrams

- **Create a quiz**
- **Edit a quiz**



Use Case Sequence Diagrams

- **Log Out (User & Admin)**



Use Cases Scenarios

Use Case - Student Registration

Primary Actors: Unregistered student, administrator
Secondary Actors: Application
Preconditions:

- The unregistered student is in the veterinary program.

Postconditions:

- The newly registered student has authenticated access to the application.

Triggers:

- The administrator moves to the "create a new account" page.

Normal Flow:

1. The administrator enters the unregistered student's email into the account creation page in the administration panel.
2. The administrator submits the form.
3. The student receives an email confirmation with a temporary password.
4. The student confirms the creation of their account.
5. The student's account information is stored in the database of the application.
6. The student is brought to a change password page.
7. The student submits a password to replace the generated version.
8. The hashed password is saved to the database of the application.
9. The student is directed to a one-time survey screen

Alternative flow:

1. a) The administrator wants to import a list of students all at once and clicks "Import Class List."
2. a) The administrator enters an invalid email and is instructed to retry
7. a) The student enters a weak password and is required to retry

Use Case - Login

Primary Actors: User, Administrator
Secondary Actors: Application
Preconditions:

- The user is registered with the application.

Postconditions:

- The registered user has authenticated access to the application.

Triggers:

- The user opens the application unauthenticated.

Normal Flow:

1. The user attempts to open the application unauthenticated.
2. The user is automatically navigated to the login page.
3. The user enters and submits their information to the login form.
4. The user is authenticated and directed to the home page.
5. The user stores the student's login date into its database

Alternative flow:

3. a)
    a. The user forgets their passwords and clicks the "forgot password" link.
    b. The user receives an email asking to reset their password.
    c. The user clicks the "reset" link and is navigated to a reset password page.
    d. The user enters a new password on the "reset" page and submits.
    e. The user logs in with their new information.
4. a) The user is an administrator and is brought to the admin panel.

Use Case - Log Out

Primary Actors: User, Administrator
Secondary Actors: Application
Preconditions:

- The user is in the application.

Postconditions:

- The user has logged out of the application.

Triggers:

- The user clicks the "logout" button available on any application page.

Normal Flow:

1. The user is logged out.

Alternative flow:

1. a) The user attempts to log out during a quiz.
    1. The user is prompted with a confirm or cancel dialog.
    2. The user makes their selection and either logs out or continues to complete the quiz.

Use Case - User Attempts Quiz

Primary Actors: User (Primarily the student, but the administrator can access as well for demonstration purposes)
Secondary Actors: Application
Preconditions:

- The user is authorized to attempt the quiz.

Postconditions:

- The user finishes the quiz, adding to their data set.

Triggers:

- The user opens the quiz page within the application.

Normal Flow:

1. The user selects to start the quiz.
2. The application pulls a list of questions from the database.
3. The user watches the video provided by the application.
4. The user selects an answer from the list of possible solutions within a specific timeframe.
5. The user submits the answer.
6. The user is brought to the end of the quiz, where they are shown their score.
7. The user stores the test information into its database.

Alternative flow:

4. a)
    1. The user doesn't select an answer.
    2. The user submits without an answer.
    3. The user is shown a validation error and is told to select an answer.
6. a) The user is brought to the next question of the quiz.

Use Case - Administrator Exports Data

Primary Actors: Administrator
Secondary Actors: Application
Preconditions:

- The administrator is in the admin panel.

Postconditions:

- The administrator receives exported data.

Triggers:

- The administrator clicks the "export data" button in the admin panel.

Normal Flow:

1. The administrator is prompted to select the students included in the data export.
2. The administrator selects the students they wish to be included in the export data.
3. The administrator selects the "submit" button.
4. The application generates a .dat file of all included students' quiz data.
5. The application prompts the administrator to download the generated file.
6. The administrator downloads the file.

Alternative flow:

2. a) The administrator selects a checkbox that selects all students automatically.

Use Case - Administrator Opens Student List

Primary Actors: Administrator
Secondary Actors: Application
Preconditions:

- The administrator is in the application's admin panel.

Postconditions:

- The administrator has access to a paginated view of all students.

Triggers:

- The user clicks the "students" button in the admin panel.

Normal Flow:

1. The application fetches a list of students from the database.
2. The application displays the list in paginated form to the administrator.
3. The administrator can view the paginated list of students.

Alternative flow:

3. a) The administrator can search the list of students.
b) The administrator can filter the list of students.

Use Case - Administrator Adds Quiz

Primary Actors: Administrator
Secondary Actors: Application
Preconditions:

- The administrator is in the admin panel.

Postconditions:

- The administrator added a new quiz to the application.

Triggers:

- The administrator clicks on the "new quiz" button in the admin panel.

Normal Flow:

1. The application prompts the administrator for quiz info, such as a title, video, answer, and possible answers.
2. The administrator submits the form.
3. The application stores it in the database.
4. The administrator is navigated to a clean "new quiz" page to add another without losing workflow.

Alternative flow:

3. a) The form could not be validated, and the administrator is directed to retry.

Use Case - Administrator Edits Quiz

Primary Actors: Administrator
Secondary Actors: Application
Preconditions:

- The administrator is in the admin panel.

Postconditions:

- The administrator modified an already existing quiz within the application.

Triggers:

- The administrator clicks on the "Edit quiz" button in the admin panel.

Normal Flow:

1. The application prompts the administrator for quiz info, such as a title, video, answer, and possible answers.
2. The administrator submits the form.
3. The application stores it in the database.
4. The administrator is navigated back to the admin panel.

Alternative flow:

3. a) The form could not be validated, and the administrator is directed to retry.

Use Case - User reviews quiz

Primary Actors: User
Secondary Actors: Application
Preconditions:

- The user is in the paginated quiz view.

Postconditions:

- The user has successfully reviewed their work.

Triggers:

- The user clicks on the "Review Quiz" button on the quiz.

Normal Flow:

1. The application displays the user's previous answers to the quiz.

Alternative flow:

1. a) There were no previous attempts on the quiz, so a message is displayed to the user by the application letting them know.

Use Case - Administrator view student progress

Primary Actors: Administrator
Secondary Actors: Application
Preconditions:

- The administrator is in the paginated student list view.

Postconditions:

- The administrator has access to the progress of a specific student.

Triggers:

- The administrator clicks on the “View” button on the student’s list item.

Normal Flow:

1. The application displays the user’s quiz history

Alternative flow:

1. a) There were no quiz attempts made by the student so nothing is shown.

Feature List

User Management

Create user account model

Description: Program the information held and behaviour of the user account
Priority: 1 (Very high)
Estimated effort required: 3
Estimated time required: 6 hrs
Acceptance Tests: Successful implementation of the features that require user account data.

Create admin account model

Description: Program the information and behaviour that will model an admin account
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 6 hrs
Acceptance Tests: Successful implementation of features that require admin account data.
Note: merged into same model, permission distinctions handled by dependency: Bouncer

General UI

Design user Landing Page

Description: Design how the landing page should look for both guests and Signed-In users
Priority: 1 (Very High)
Estimated effort required: 1 (Very Low)
Estimated time required: 4 hrs
Acceptance Tests: Landing page successfully displayed for guests and signed-in users.

Implement visual design of user Landing Page

Description: Program the interface to look as close as possible to the design
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 8 hrs
Acceptance Tests: Successful implementation of landing page visual design.

Design login View for User

Description: Design how the login view will look
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 2 hrs
Acceptance Tests: User is able to log in successfully from the login view.

Implement visual design of login View for User

Description: Program the interface to look according to design
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 6 hrs
Acceptance Tests: Successful implementation of user login view.

Design user registration view for User

Description: Design the “Create an Account” interface
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 4 hrs
Acceptance Tests: A test account is able to be registered.
Note: reworked into a ‘confirmation’ view that the user is directed to from an email received due an admin creating the user account.

Implement user registration view for User

Description: Implement “Create an Account” interface
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 4 hrs
Acceptance Tests: Successful implementation of user registration view.

Design of User credential recovery

Description: Design the “Forgot my Password” view
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 1 hrs
Acceptance Tests: The password of a test account is able to be recovered/reset.
Note: using the default Laravel password recovery from the login page, or the admin can click a button to reset the user’s password

Implement visual design of User credential recovery

Description: Program the “Forgot my Password” interface
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 2 hrs
Acceptance Tests: Successful implementation of user credential recovery.
Note: using default Laravel ‘forgot password’ page

Design of “My Account” view

Description: Design how Signed-In Users “My Account” view will look
Priority: (2) High
Estimated effort required: 2
Estimated time required: 4 hrs
Acceptance Tests: Test account is able to navigate to “My Account”.

Implement visual design of “My Account” view

Description: Program the interface of Signed-In Users “My Account”
Priority: 2
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Successful implementation of My Account view.

Design of “Settings” view

Description: Design the “Settings” view where users can change password, update personal information (name, email address, ~~student ID~~)
Priority: 2
Estimated effort required: 2
Estimated time required: 2 hrs
Acceptance Tests: Test account is able to navigate to “Settings”.
Note: functionality has been partially merged into the ‘My Account’ view/route.
Student ID no longer being used due to privacy concerns. Email is the unique identifier.

Implement visual design of “Settings” view

Description: Program the interface of Settings view, where users will be offered common functionality regarding Account Management.
Priority: 3
Estimated effort required: 3
Estimated time required: 6 hrs
Acceptance Tests: Successful implementation of Settings view.

Design of “Overview” view

Description: Design the interface users where users are pointed to other parts of the app, such as Taking a Quiz, Reviewing past quizzes and see select relevant statistics of their account.
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 6 hrs
Acceptance Tests: Test account is able to navigate to “Overview” view.
Note: implemented navigation bar that lets users control where they want to go

Implement visual design of “Overview” view

Description: Program the interface where Signed-in users can access various parts of the app
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 12 hrs
Acceptance Tests: Successful implementation of “Overview” view.

Design of “Take a Quiz” view

Description: Design the user view when a user chooses to take a Quiz, including video player and answer options
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 6 hrs
Acceptance Tests: Test account is able to partake in a quiz.

Implement visual design of “Take a Quiz” view

Description: Program the interface for when a user starts taking a quiz, including the video player, answer choices, score, etc
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 16 hrs
Acceptance Tests: Successful implementation of “Take a Quiz” view.

Design of “Review past Quizzes” view

Description: Design the user view when they choose in the “Overview” to review past quizzes
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 6 hrs
Acceptance Tests: Test account is able to review the quizzes they have already completed.

Implement “Review past Quizzes” view

Description: Program the interface users will see when they choose to review past quizzes
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 16 hrs
Acceptance Tests: Successful implementation of “Review Past Quizzes” view.

Design login view for Admin user

Description: Design the sign-in portal for Admin users
Priority: 1 (Very High)
Estimated effort required: 1 (Very High)
Estimated time required: 4 hrs
Acceptance Tests: Test admin account is able to login.

Implement admin login view

Description: Program the interface that admins will use to login
Priority: 1 (Very high)
Estimated effort required: 3
Estimated time required: 4 hrs
Acceptance Tests: Successful implementation of admin login.

Design admin user management view

Description: Design the user account management view where they can moderate user accounts
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 12 hrs
Acceptance Tests: Test admin account can moderate user accounts.

Implement visual design admin user management

Description: Program the interface admins will use to moderate user accounts
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 8 hrs
Acceptance Tests: Successful implementation of admin user management features.

Design admin user “View user” view

Description: Design the interface for admins when they select “View user” for specific users
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 6 hrs
Acceptance Tests: Test admin account is able to see relevant information of user accounts.
Note: Missing ability for admins to view user’s quiz history

Implement visual design for “View user”

Description: Program the “View user” interface admins will use to inspect relevant information of user accounts (email, name, etc.)
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 6 hrs
Acceptance Tests: Successful implementation of admin “View User” feature.

Design admin user “Create user account” view

Description: Design the interface for admins to use when creating user accounts
Priority: 2 (High)
Estimated effort required: 3
Estimated time required: 8 hrs
Acceptance Tests: Test admin account is able to create a new user account.

Implement visual design of admin user “Create user account”

Description: Implement the interface admins will use to create user accounts
Priority: 2 (High)
Estimated effort required: 4
Estimated time required: 12 hrs
Acceptance Tests: Successful implementation of admin “Create User Account” feature.

Design of admin content management overview

Description: Design admin content management view where it will be used to create, view and edit quizzes on the database
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 6 hrs
Acceptance Tests: Test admin account is able to create and edit quizzes in the database.

Implement visual design of admin content management index view

Description: Program the interface where admins will see all quizzes/content and have options to create, view and edit
Priority: 1 (Very High)
Estimated effort required: 2
Estimated time required: 8 hrs
Acceptance Tests: Successful implementation of admin content management interface.
Note: Reworking admin views to a cleaner design, horizontal entries instead of boxes.

Design admin create quiz view

Description: Design admin create quiz form
Priority: 1 (Very High)
Estimated effort required: 3
Estimated time required: 4 hrs
Acceptance Tests: Test admin account is able to create a new quiz.

Implement admin create quiz view

Description: Program form used by the admin for creating a new quiz
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Successful implementation of admin create quiz feature.

Design admin edit quiz view

Description: Design admin edit quiz form
Priority: 2 (High)
Estimated effort required: 3
Estimated time required: 6 hrs
Acceptance Tests: Test admin account is able to edit existing quizzes.

Implement visual design of admin edit quiz view

Description: Program the interface admins will use to edit quizzes
Priority: 2 (High)
Estimated effort required: 4
Estimated time required: 6 hrs
Acceptance Tests: Successful implementation of admin edit quiz feature.

Data Display and Management

Setup database

Description: Setup database within the project
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Project features are able to successfully interact with the database.

Create a privilege system for accounts

Description: System that will enable admins to take actions related to moderating users and content.
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 12 hrs
Acceptance Tests: Successful implementation of privilege system, where admin accounts have access to all features, whereas user accounts have limited privileges.
Note: designed with Bouncer dependency in mind

Create quiz model

Description: Create model that stores relevant information and has appropriate behaviour and validations for a quiz
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Test quiz is able to be created and is fully functional.

Data Processing System

Create a system to track user quiz statistics

Description: Implement a system that tracks quiz statistics, such as score (correct/wrong answers count, attempts)
Priority: 2 (High)
Estimated effort required: 4
Estimated time required: 6 hrs
Acceptance Tests: Test quizzes can be created and have their statistics tracked.

Create a system to validate quiz creation

Description: Implement a system for ensuring a quiz reaches a set of requirements, and validates its contents.
Priority: 2 (High)
Estimated effort required: 4
Estimated time required: 6 hrs
Acceptance Tests: Test quiz successfully validated and uploaded to quiz database.

Create a system to enable video uploading

Description: Implement system for uploading videos to the appropriate hosting service (e.g. Google Drive).
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 12 hrs
Acceptance Tests: Successful uploading of videos to hosting service.

Research video players

Description: Research on best approach how to (if needed) implement a video player.
Priority: 2 (High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Present findings on how to implement a video player.

Implement video player

Description: Implement required dependencies and logic for a functional front-end video player
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 20 hrs
Acceptance Tests: Video player successfully implemented.

Create API to handle video between system and storage

Description: Implement system for upload and loading videos from storage hosting platform
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Successful implementation of all features involving the uploading and hosting of videos.

Create API to handle quiz request

Description: Implement system for when users will request a quiz, to have front-end request relevant information to display the content
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Test user account is successfully able to request, view, and interact with a quiz.

Create system for exporting a user's metrics to a human readable file

Description: Implement system allowing admins to export the data associated with user accounts to a text file
Priority: 1 (Very High)
Estimated effort required: 4
Estimated time required: 8 hrs
Acceptance Tests: Test admin account is able to successfully export requested user data to a properly formatted file.

Miscellaneous

Research mailer services for our project

Description: Explore available services, and figure out the optimal for our scope/usage
Priority: 2 (High)
Estimated effort required: 3
Estimated time required: 4 hrs
Acceptance Tests: Decide on how to approach mail services for the project.

Setup chosen mailer service

Description: Setup mailer service, which in turn enables the application to email the user regarding account administration (such as resetting passwords, account confirmation, account notifications)
Priority: 1 (High)
Estimated effort required: 3
Estimated time required: 8 hrs
Acceptance Tests: Mail services successfully implemented.

Research Docker and familiarize with the tool

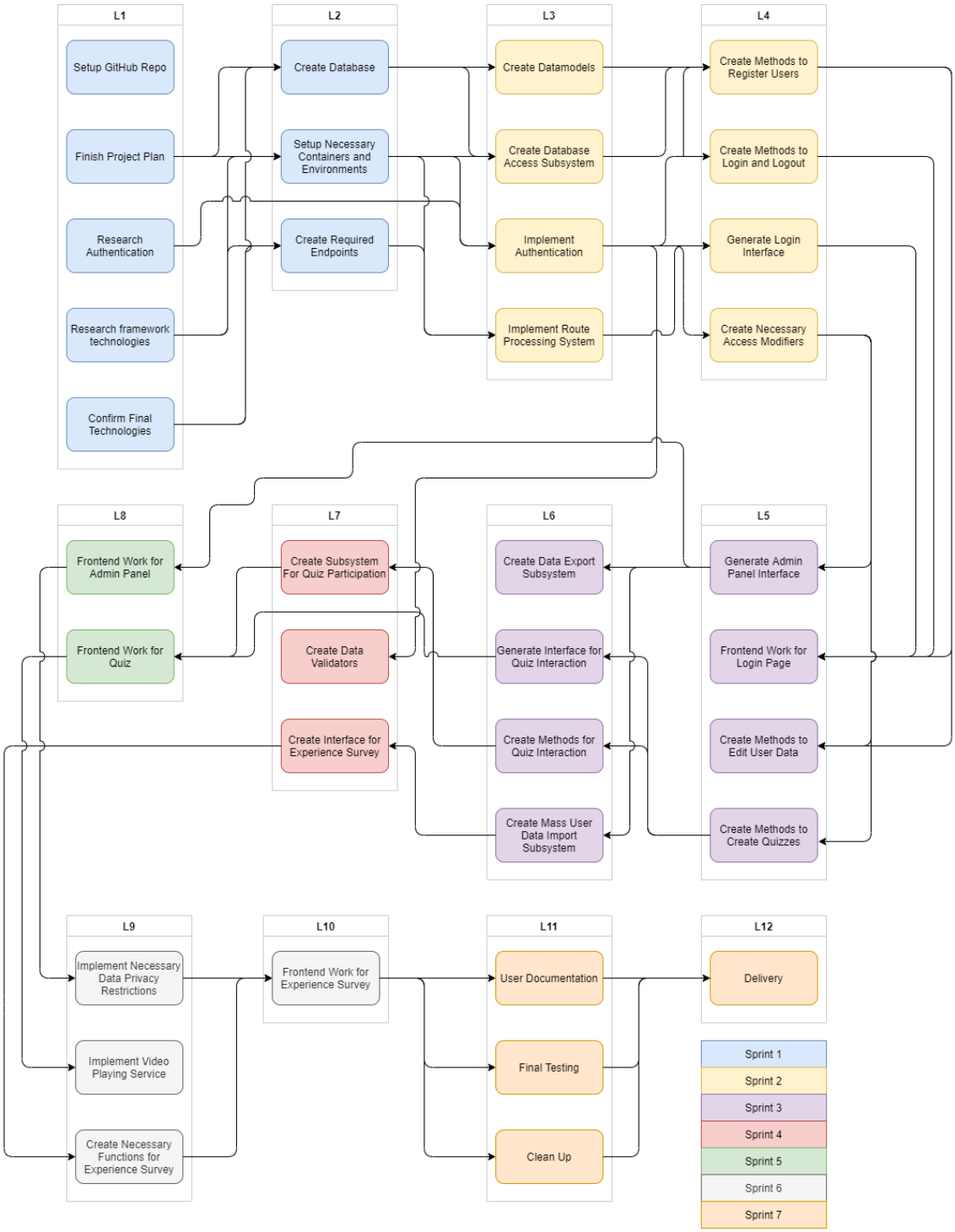
Description: Based on the use cases, research optimal hosting service (eg. AWS)
Priority: 2*
Estimated effort required: 3
Estimated time required: 4 hrs
Acceptance Tests: Group members successfully set up development environments on local machines.

Prepare deployment to production hosting environment for production

Description: Setup an public environment where production build will be hosted
Priority: 2*
Estimated effort required: 3
Estimated time required: 4 hrs
Acceptance Tests: Successful hosting of the project.

Delivery

Dependency Chart

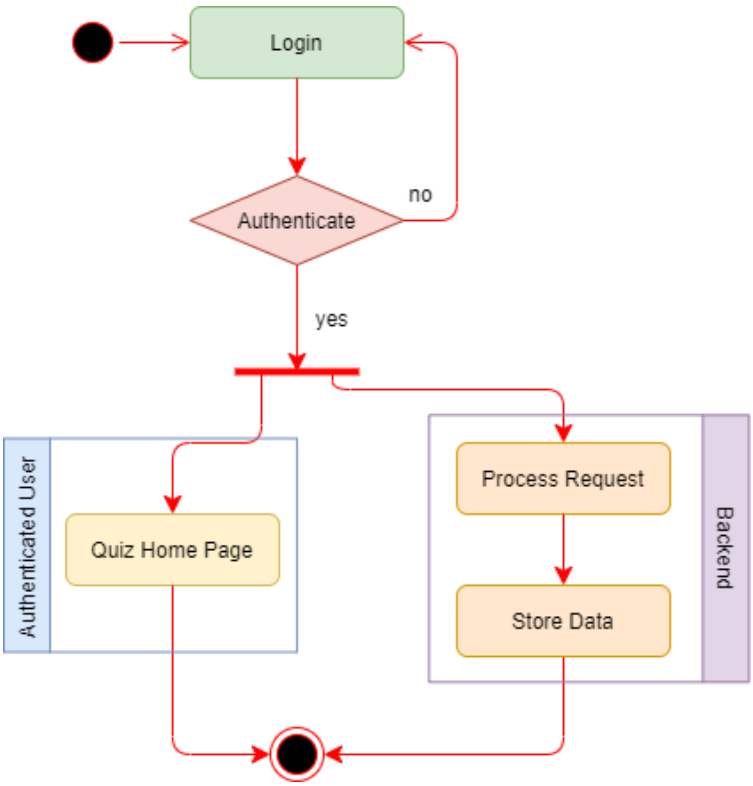


Design

Use Case Activity Diagrams

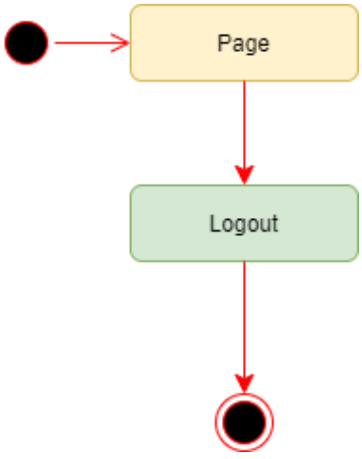
Use Case Activity Diagrams

• Log In



Use Case Activity Diagrams

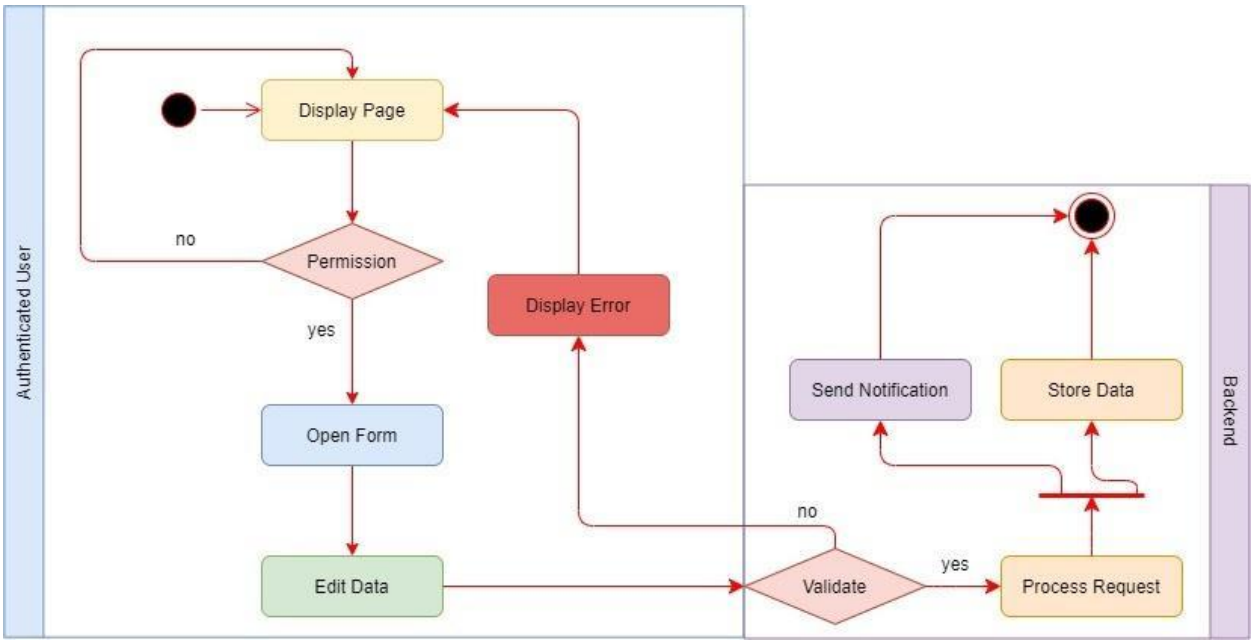
• Log out



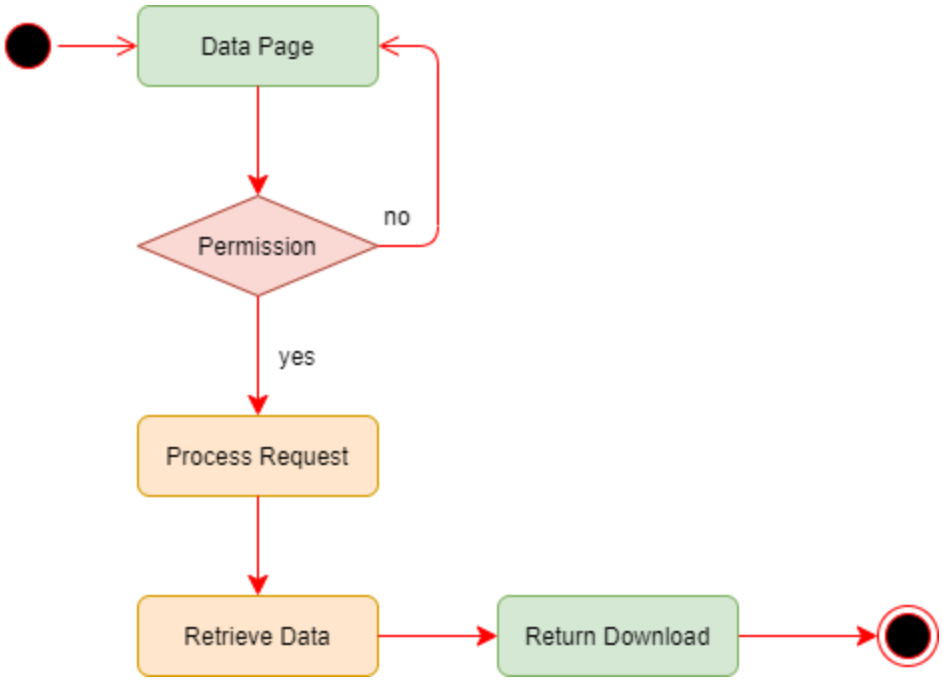
Use Case Activity Diagrams

• Create a quiz
• Edit a quiz
• Attempt quiz
• Review Quiz
• View student list

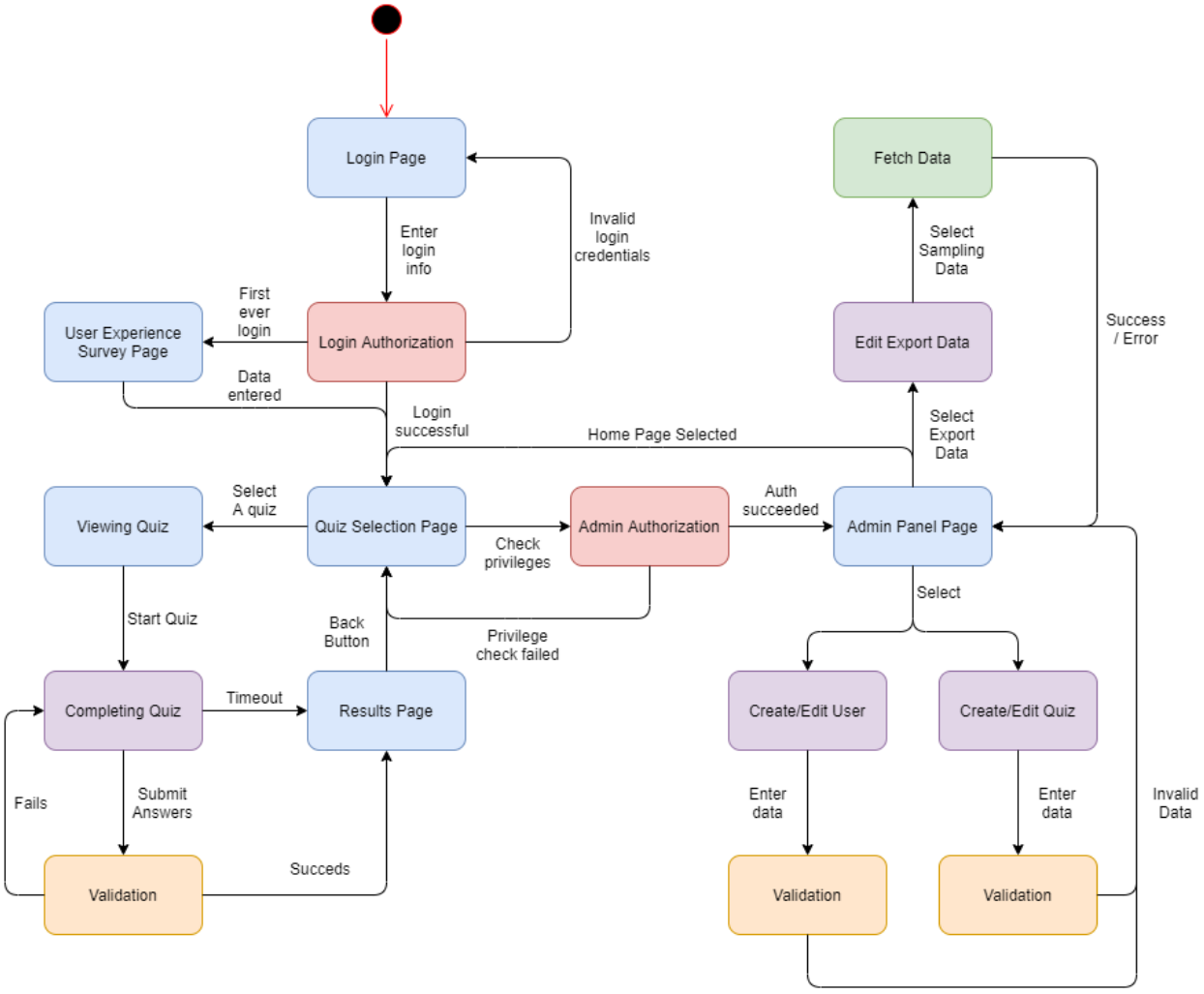
• View student progress
• Register User



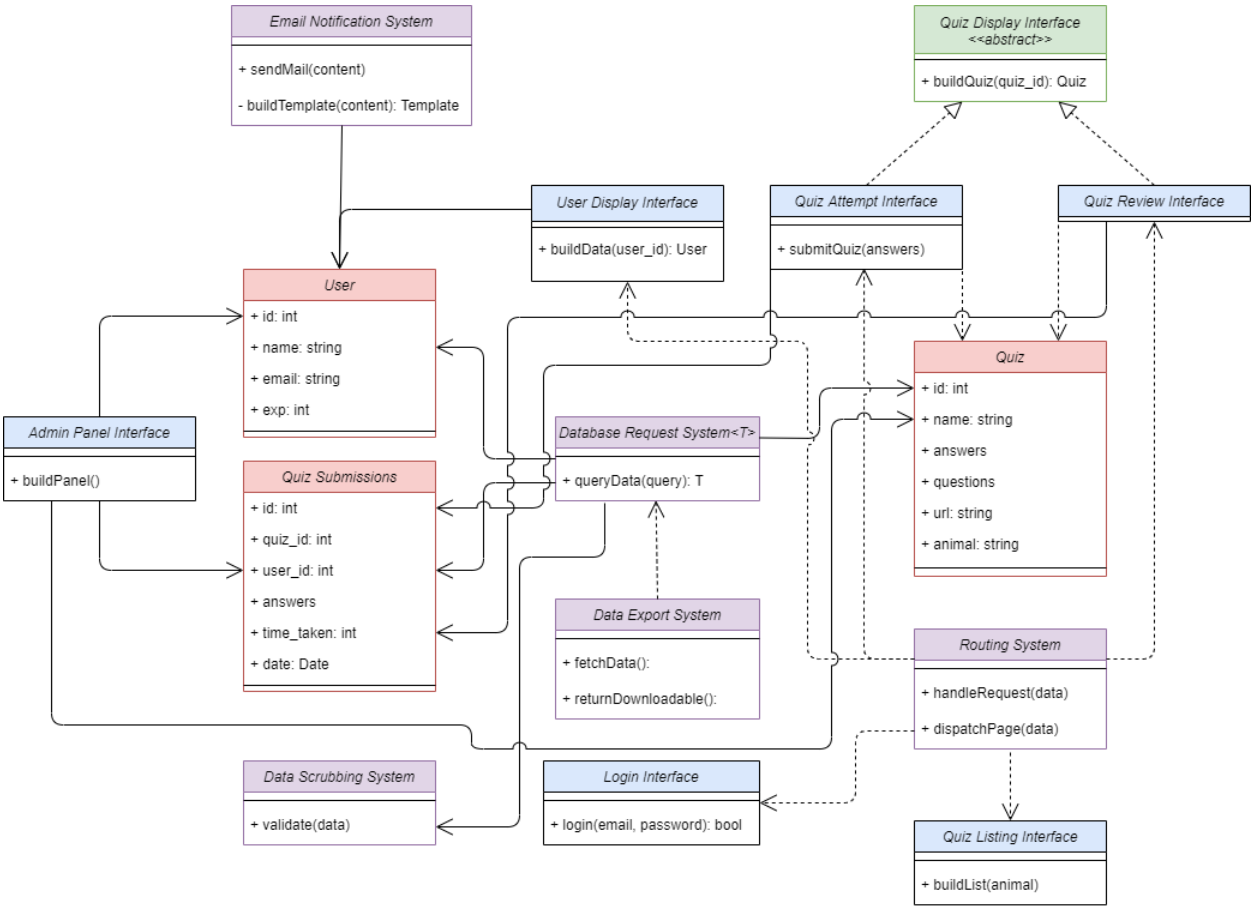
Use Case Activity Diagrams
• Export Data



State Diagram



Initial Class Definitions


Email Notification System
+ sendMail(content)
- buildTemplate(content): Template
Quiz Display Interface
<<abstract>>
+ buildQuiz(quiz_id): Quiz
User Display Interface
+ buildData(user_id): User
Quiz Attempt Interface
+ submitQuiz(answers)
Quiz Review Interface
User
+ id: int
+ name: string
+ email: string
+ exp: int
Quiz
+ id: int
+ name: string
+ answers
+ questions
+ url: string
+ animal: string
Admin Panel Interface
+ buildPanel()
Database Request System<T>
+ queryData(query): T
Quiz Submissions
+ id: int
+ quiz_id: int
+ user_id: int
+ answers
+ time_taken: int
+ date: Date
Data Export System
+ fetchData():
+ returnDownloadable():
Routing System
+ handleRequest(data)
+ dispatchPage(data)
Data Scrubbing System
+ validate(data)
Login Interface
+ login(email, password): bool
Quiz Listing Interface
+ buildList(animal)

CRC Model

Class: User	
Responsibilities • Datamodel of user required for backend • Holds relevant information including user experience level for data export • Has any required helper methods	Collaborators • Email Notification System • Admin Panel Interface • User Display Interface • Database Request System
Class: Quiz	
Responsibilities • Datamodel of quiz required for backend • Holds relevant information including animal type for further animal expansion • Has any required helper methods	Collaborators • Quiz Display Interface • Admin Panel Interface • Database Request System
Class: Quiz Submission	
Responsibilities • Datamodel of quiz attempts required for backend • Holds relevant information • Has any required helper methods	Collaborators • Quiz Display Interface • Admin Panel Interface • Database Request System
Class: Email Notification System	
Responsibilities • Helper class that assists in building and sending email notifications • Has any required helper methods	Collaborators • User

Class: Database Request System	
Responsibilities • Holds a generic object that dictates how DB queries are structured • Has any required helper methods	Collaborators • Data Export System • Data Scrubbing System • Quiz • User • Quiz Submissions
Class: Data Scrubbing System	
Responsibilities • Scrubs requests and queries for permission and injections • Has any required helper methods	Collaborators • Database Request System
Class: Data Export System	
Responsibilities • Organizes and gathers data for export • Generates downloadable file for admin • Has any required helper methods	Collaborators • Database Request System
Class: Routing System	
Responsibilities • Genericizes page delivery to ease development with API • Has any required helper methods	Collaborators • Quiz Display Interface • Quiz Listing Interface • Login Interface • User Display Interface • Admin Panel Interface

Class: Quiz Display Interface	
Responsibilities • Builds the quiz interface required for attempting or reviewing a quiz • Has any required helper methods	Collaborators • Quiz Submissions • Routing System • Quiz
Class: User Display Interface	
Responsibilities • Builds the interface for displaying users to the administrator • Has any required helper methods	Collaborators • User • Routing System
Class: Admin Panel Interface	
Responsibilities • Builds the interface for the admin panel that houses many utilities • Has any required helper methods	Collaborators • Quiz • User • Quiz Submissions
Class: Login Interface	
Responsibilities • Builds the interface that assists users in logging in to the system	Collaborators • Routing System