



**Engineering
& Computing**

School of Computing
& Information Sciences

School of Computing & Information Sciences

Spring 2019 Senior Design Project

Minorities Inspiring Minorities in CS (MIMIC) 2.0

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Problem

Research has shown that the lack of role models is one barrier to recruiting under represented groups (Hispanics, African Americans, Native Americans, and women) into computer science.

Solution

As part of an NSF-funded project, MIMIC will expose sixth grade students, at local Title I schools in Miami Dade, to stories about minority and women role models in computer science.

Students will participate in reading, watching, and interactive activities through a Chromebook web browser. Students will be able to submit stories of their own regarding their experiences

Current System

MIMIC 1.0 has an API service in the frontend able to make calls to the backend for SQL data.

Activity Progress logic is in the front end using persistence storage from the DB for updating progress variables.

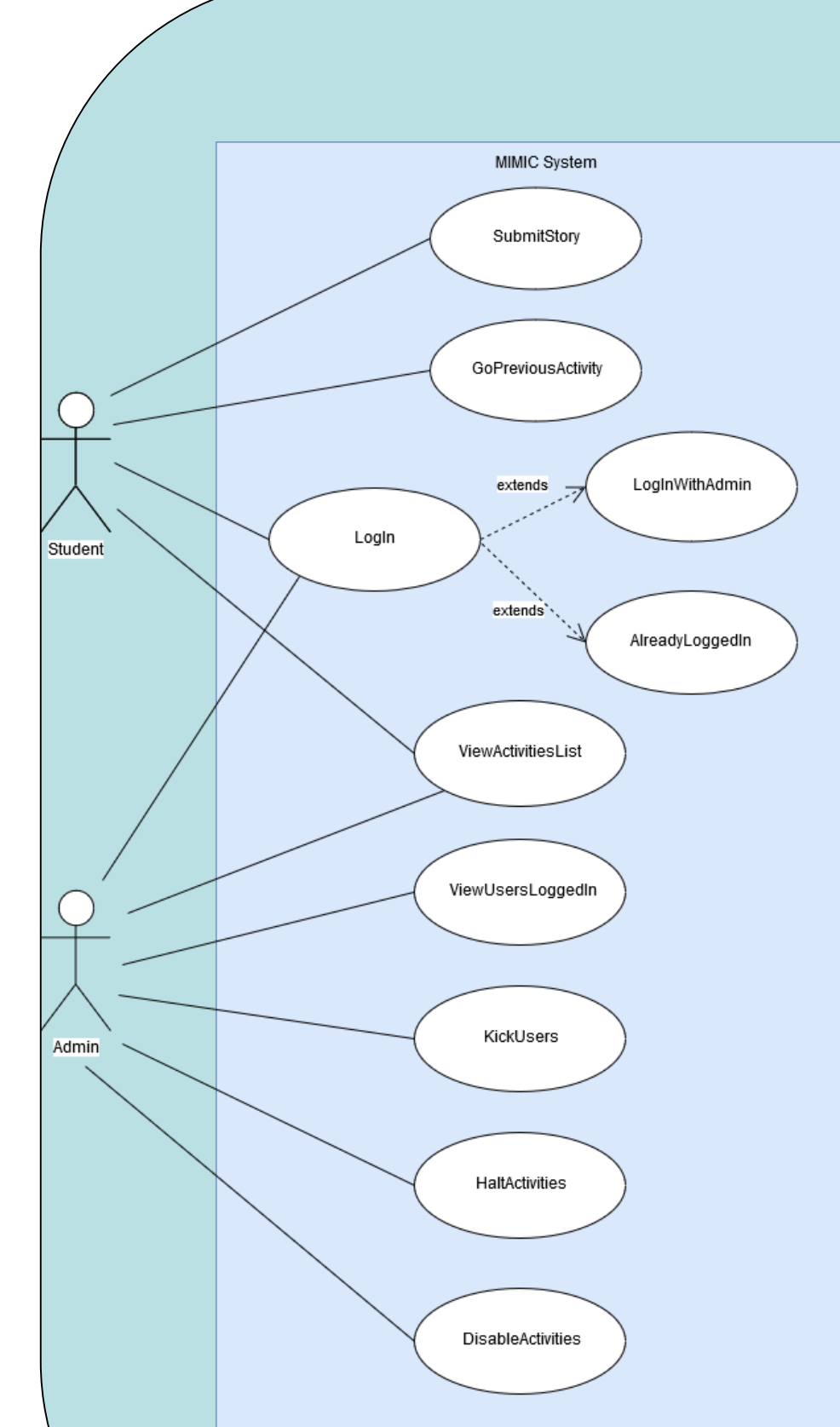
Verified as working:

- Reading Activity
- Character Map Activity
- User Creation
- User Log-in
- Activity Work Flow

Needs debugging/implementation:

- Activity Progress is not accurate.
- Collect Story activity needs front/back end controllers and form validation.

Requirements



Functional Requirements:

Given as set of user cases presented to the left.

Add watch-video activity type

Add a scheduled job that removes old session from the DB.

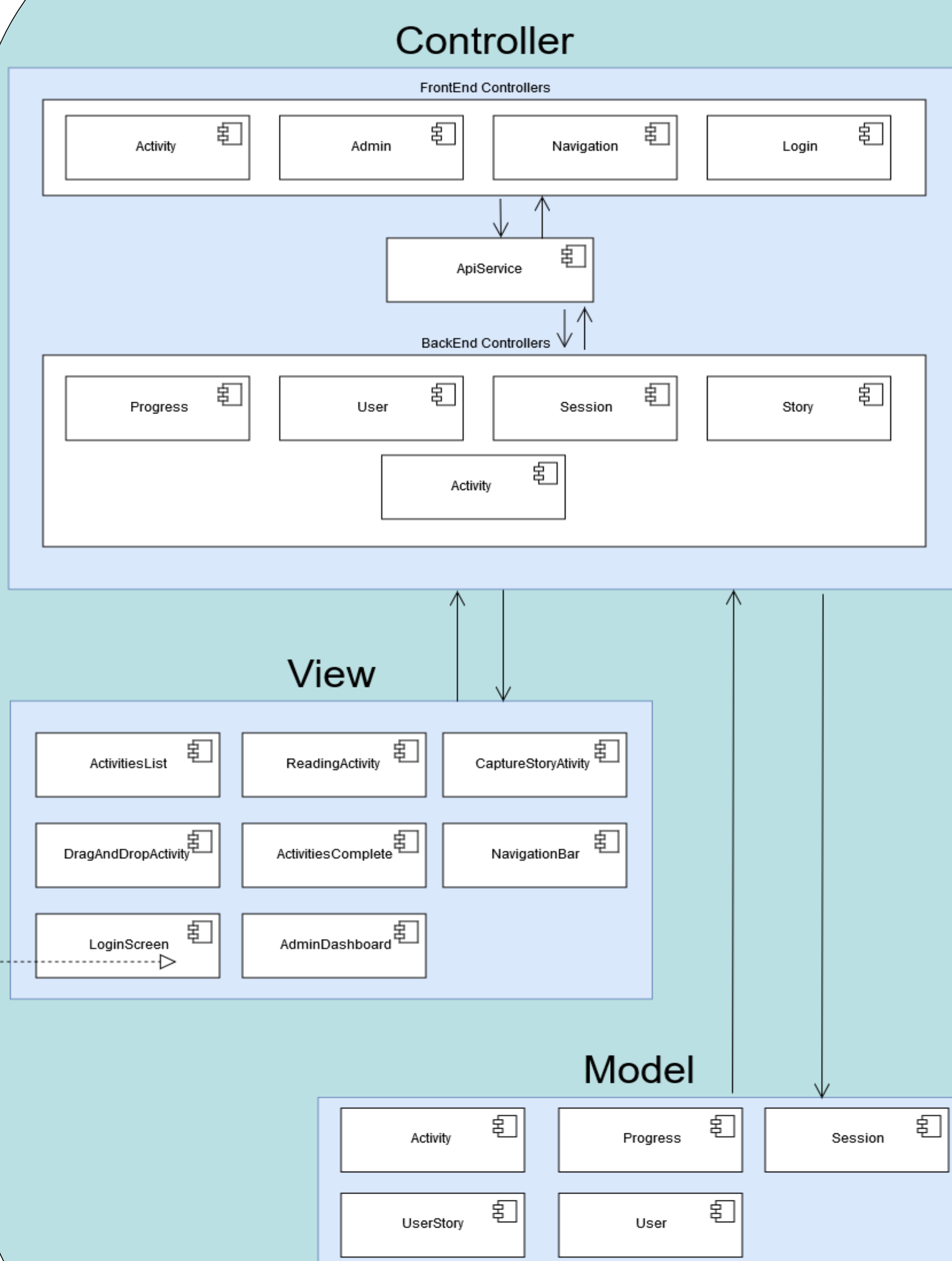
Other requirements:

Upgrading DB from SQLite to MySQL.

Testing performed using a Chromebook provided by product owner.

System Design and Object Design

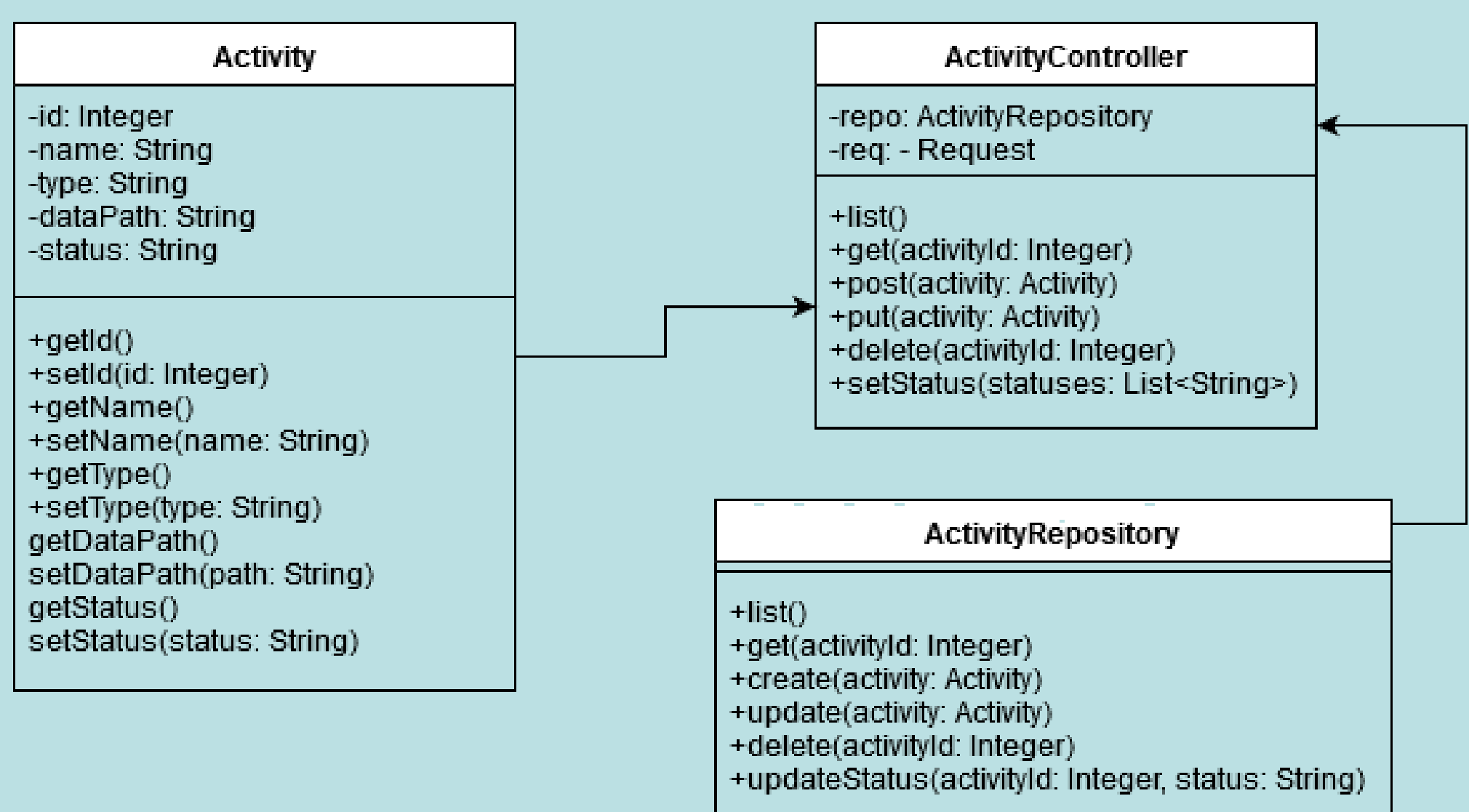
MVC Architecture



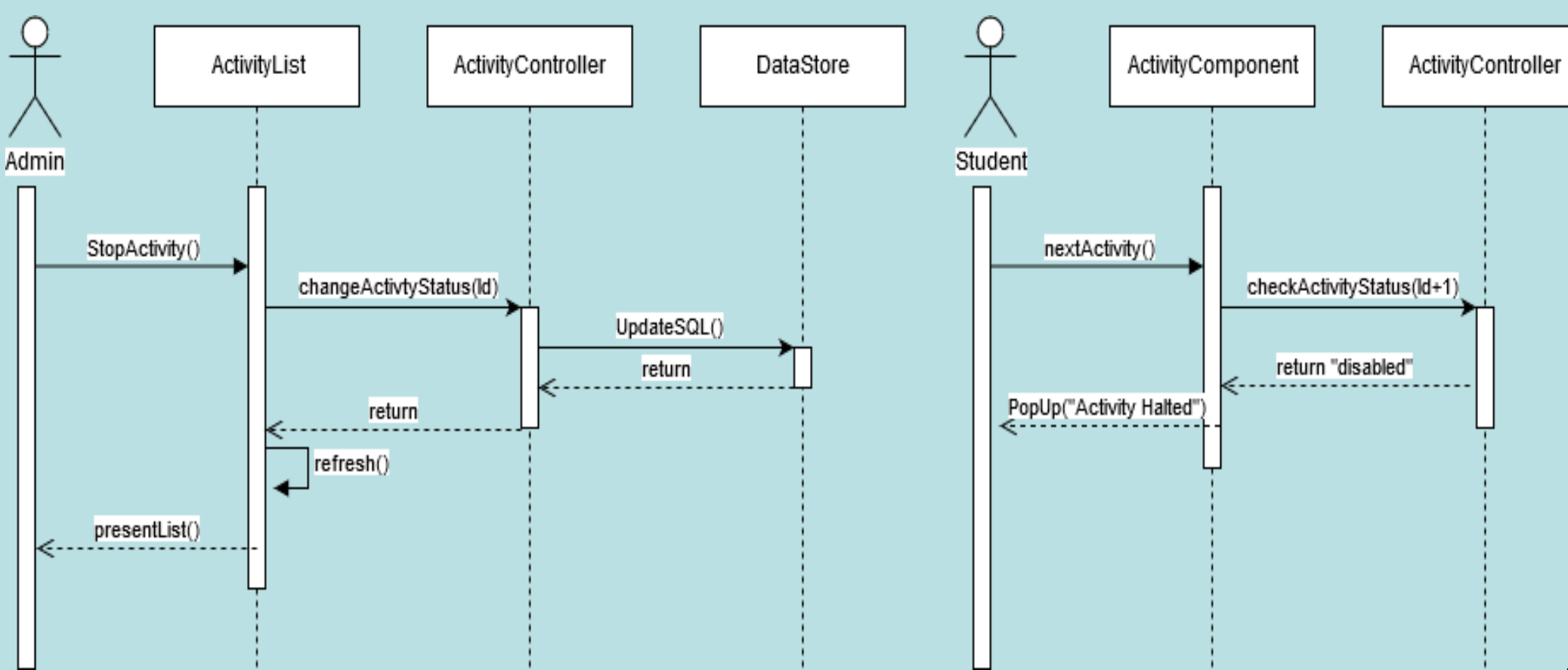
Use Case

Name: HaltActivities
Actors: Admin, Student

Class Diagram



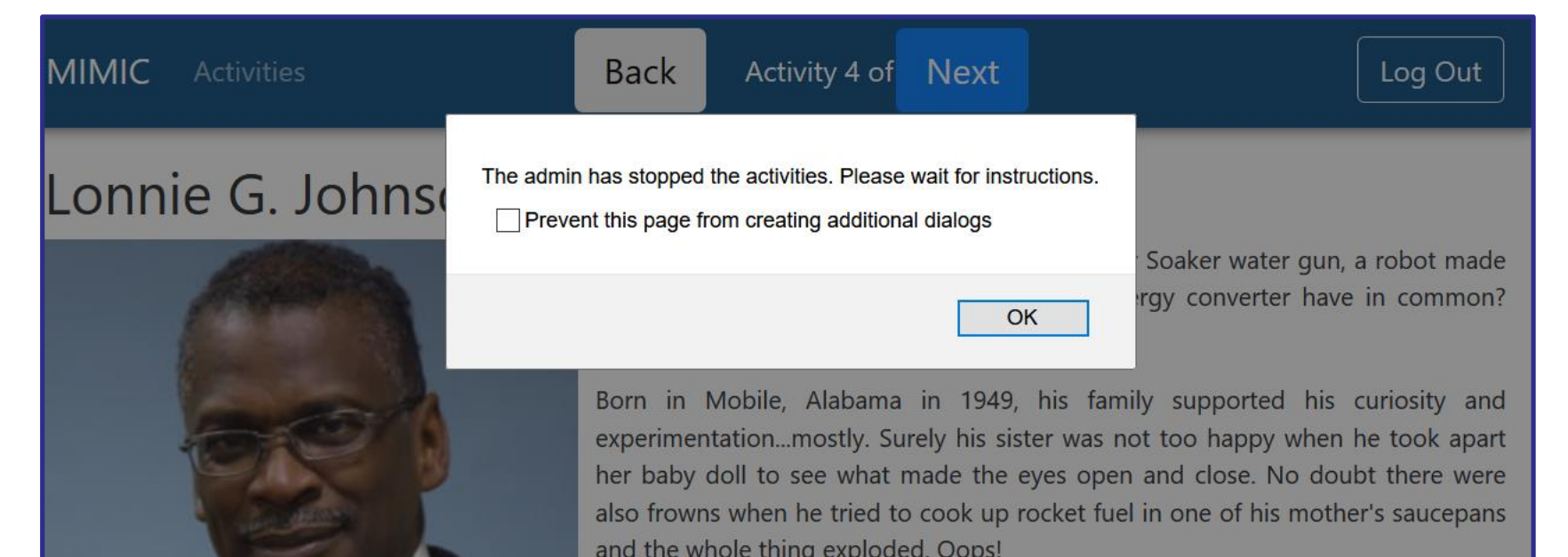
Sequence Diagram



Screenshots

Stopped	Disabled	Status	ID	Type	Name
☐	☐	enabled	1	story	Welcome
☐	☒	disabled	2	collect	How do you feel about Computer Science?
☐	☒	disabled	3	story	Watching Inspirational Video
☒	☐	stopped	4	story	Lonnie G. Johnson

Update Activities
Reset Activities



Verification

Manual System Testing Performed

Test Case ID: 01_MIMC94	(Sunny)
Purpose	Verify that a student cannot progress past an activity that has been marked as stopped by the admin.
Preconditions	There are 12 activities with ID 1 through 12 Admin has placed a stop on activity 2 User 9 is not logged in User 9 has completed activity 1
Input	User 9 logs in and is taken to activity 2 User 9 completes activity 2 and hits the next or submit button
Expected Output	A pop up displays with text "Admin has stopped activities. Please wait for instructions". Activity 2 is not marked as complete in the DB.
Test Case ID: 02_MIMC94	(Rainy)
Purpose	Verify that a student can continue to work on an activity if a previous activity has been disabled
Preconditions	There are 12 activities with ID 1 through 12 Admin has placed a stop on activity 2 User 9 is logged in User 9 has completed activities 1,2,3
Input	User 9 logs in and is taken to activity 4 User 9 completes activity 4 and hits the next or submit button
Expected Output	User 9 is taken to Activity 5 Activity 4 is marked as complete in DB

Implementation



- AngularJS for the front end logic and view control.
- Bootstrap for CSS styling.
- Jooby for the business logic and handling of http requests and web service calls.
- MySQL for persistent data storage.
- NodeJS for initialization of the web server.
- Maven for dependency control.
- Microsoft Visual Studio Code as a JavaScript and Java editor.

Summary

- The development cycle was in part dedicated to finishing functionality for the student user such as SubmitStory and GoPreviousActivity and ViewActivityList use cases.
- The majority of the time (4 out of 6 sprints) was dedicated to expanding the functionality of the administrator. Use cases implemented for the administrator include viewUsersLoggedIn, KickUsers, HaltActivities, and DisableActivities.
- In addition, the backend was updated to better handle multiple users logging in. A set of credentials may only be used once, and the admin may not log in with a student.
- A scheduled service was also added to remove old sessions tokens (currently taken to be 15 minutes old) from the DB - forcing inactive users to log in again.
- This development cycle relied on the architecture and functionally already built by the Version 1 development team. There was substantial additions and modifications made to the frontend. For the backend, there were new API(s) added to handled the new functionality along with the respective models.

Acknowledgement

The material presented in this poster is based upon the work by Juan Diaz. I am thankful for the feedback and guidance offered by product owners Dr. Mark Finlayson, Victor H. Yarlott, and Labiba Jahan.