

Design and UI

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2/28/24

1 Project Summary

The goal of my project is to provide my client with an application that generates a course schedule based on a variety of user preferences. The data will be stored in a database so that it is saved, and the user will be able to edit it.

2 Architecture

2.1 Chosen Architecture: Model-View-Controller (MVC)

My project will follow the MVC architecture to separate concerns effectively.

- **Model:** Manages faculty, courses, scheduling constraints, and global rules.
- **View:** Provides a graphical interface for interaction.
- **Controller:** Handles user inputs, logic, and interactions between Model and View.

2.2 Main Modules

- **User Management Module** – Handles faculty information storage and editing.
- **Course Management Module** – Stores courses, allows additions, edits, and constraints.
- **Scheduling Engine** – Implements logic to generate and optimize semester schedules.
- **GUI Module** – Provides an interactive interface.
- **Data Import/Export Module** – Supports bulk imports and generates formatted outputs.
- **Storage Module** – Manages faculty, courses, and constraints in a database.

2.3 Simplified Class Diagram

- **User** \rightarrow interacts with **GUI**
- **GUI** \leftrightarrow **Controller**
- **Controller** \leftrightarrow **Model** (Faculty, Course, Schedule, Constraints)
- **Model** \leftrightarrow **Database**

3 Technology

Programming Language:

- Java (for backend logic and scheduling algorithm)
- JavaScript (for frontend interface)

Frameworks:

- Frontend: React.js
- Database: Firebase

4 Data Structure

4.1 Database Schema

- faculty: { id, name, time_start_preference, time_end_preference, num_courses, preferred_courses: [] }
- courses: { id, name, credits }

5 Coding Standards

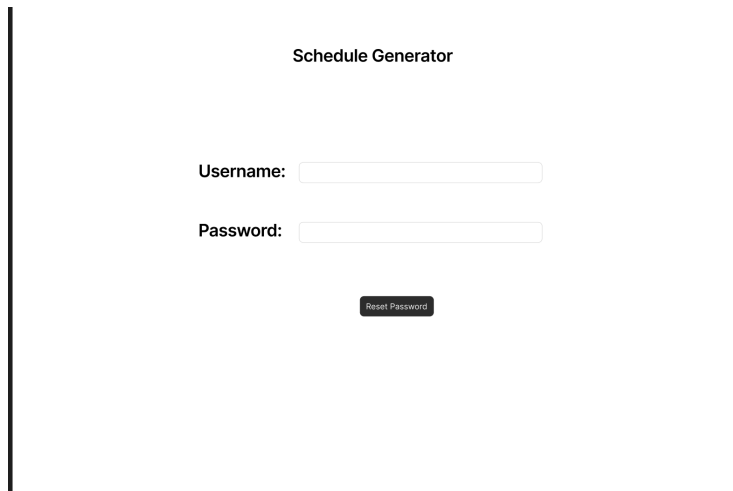
Database Naming Conventions:

- Table names in lowercase
- Column names in snake_case

Code Quality Standards:

- Follow typical Java naming conventions (PascalCase for classes, camelCase for methods and variables)
- Require unit tests for all modules, with >50% test coverage before committing.

6 User Interface Screens



The login screen is centered on a white background. It features a title "Schedule Generator" at the top. Below the title are two input fields: "Username:" and "Password:". A "Reset Password" button is located below the password field. The entire form is flanked by two vertical lines, one on the left and one on the right.

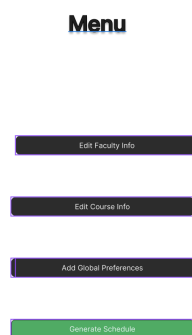
Schedule Generator

Username:

Password:

[Reset Password](#)

Figure 1: Login Screen



The main menu is centered on a white background. It features a title "Menu" at the top. Below the title are four buttons: "Edit Faculty Info", "Edit Course Info", "Add Global Preferences", and "Generate Schedule". The "Generate Schedule" button is highlighted in green, while the others are dark blue.

Menu

[Edit Faculty Info](#)

[Edit Course Info](#)

[Add Global Preferences](#)

[Generate Schedule](#)

Figure 2: Main Menu

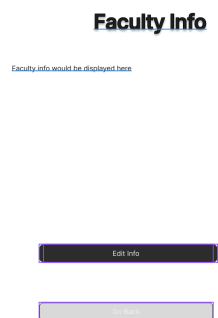


Figure 3: Faculty Information Screen



Figure 4: Course Information Screen

Global Preferences

Global preferences would be displayed here

Edit Info

Figure 5: Schedule Screen

Schedule

Schedule would be displayed here

Edit Schedule

Re-generate Schedule

Export Schedule

Figure 6: Export Schedule Screen

Export

Excel or Word ▾ ▸

Download

Cancel

Figure 7: Global Preferences Screen