Design Document for ISU PULSE

Group 3_roy_2
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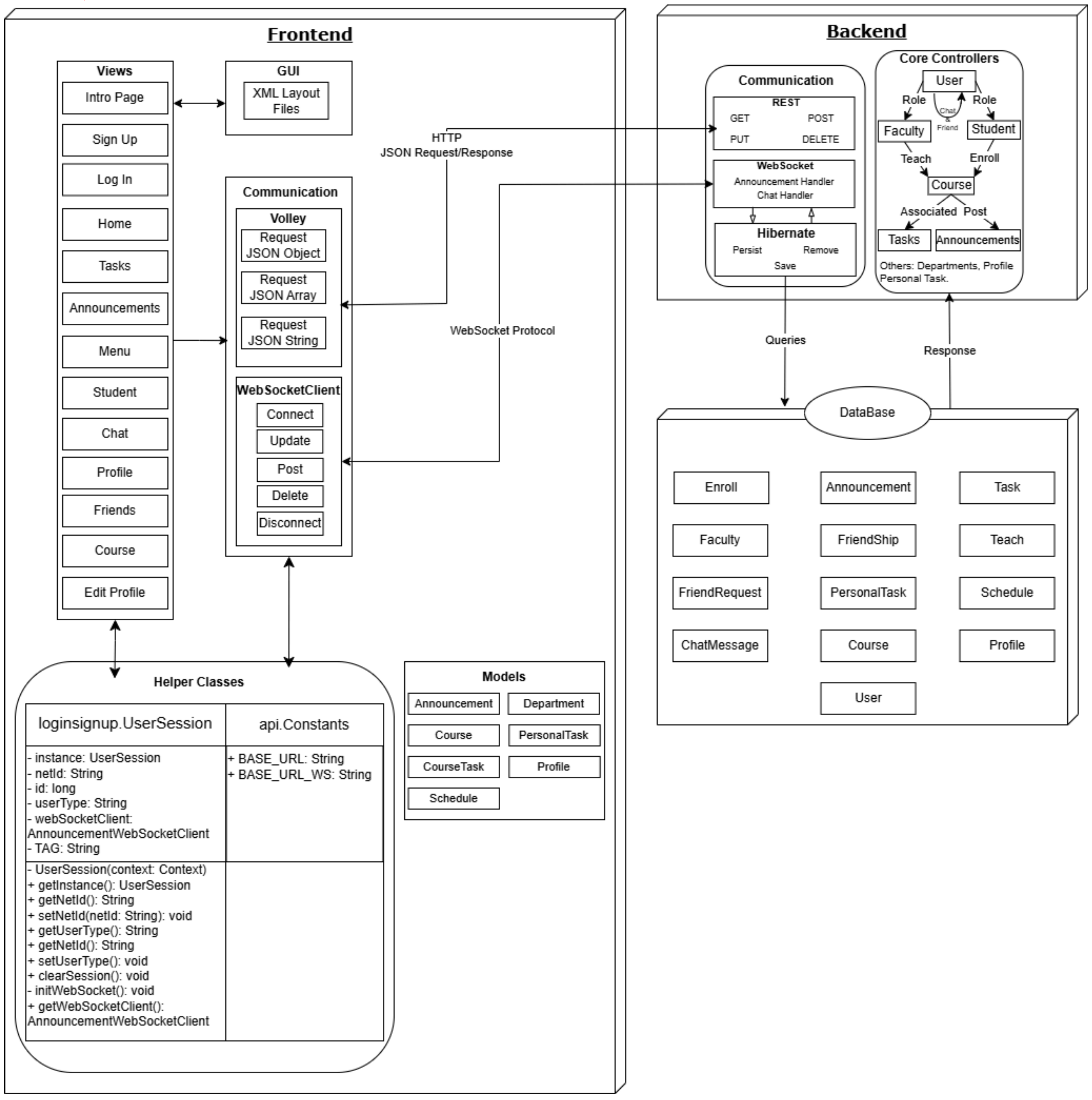
PUT THE BLOCK DIAGRAM PICTURE ON THIS PAGE! (Create the picture using pencil or drawIO)



Use this third page to describe complex parts of your design.

Block Diagram Description

Frontend

- Login & Signup (User can be specified as Teacher or Student): The user signs up, which creates a REST POST request and adds it to the request queue, or signs in, which sends a GET request to the backend (through the Volley library). The passwords are hashed. Once logged in, even quitting the app or turning off the emulator will not log out the user.
- Home/Dashboard: It will be opened after signing in or signing up and can be accessed through the menu, too. Fetches the Tasks, personal or course assignments, and announcements. Shows a calendar. By clicking on the "ADD TASK" button, students can create a task. They can also edit a task by clicking on the "EDIT TASK" button. There is also a "Delete" button for tasks. Tasks, announcements, and calendar have their own special adaptors.
- Profile: The user can click on Profile through the menu and see their name, profile image, bio, LinkedIn, and any external URL. There is also a log-out button.
- Courses: Users can view all courses they are taking in the profile page (Course name, course description, time, recurring pattern, credits).
- Announcements: The teacher can send announcements by going to the course page and clicking on "Post Announcement." The announcements are handled by WebSockets.
- Edit Profile: User can edit their profile, such as passwords, bio, external and LinkedIn URLs. They first need to validate their netID and password.
- Friends: User can view their friend profile, friend list, friend requests, send requests, and friend suggestions.
- Chat: Two users can chat with each other by WebSocket, and the application can also fetch all message history between two users.

Backend

Communication:

The backend uses REST controllers to communicate with the database through Hibernate.

1. Post: Register a new user (student/ faculty).
2. Get: Fetch a course faculties teaching, students taking, fetch user profile, list of enrollments.
3. Put: Update the user's profile, account information, and task information.
4. Delete: Delete user accounts.

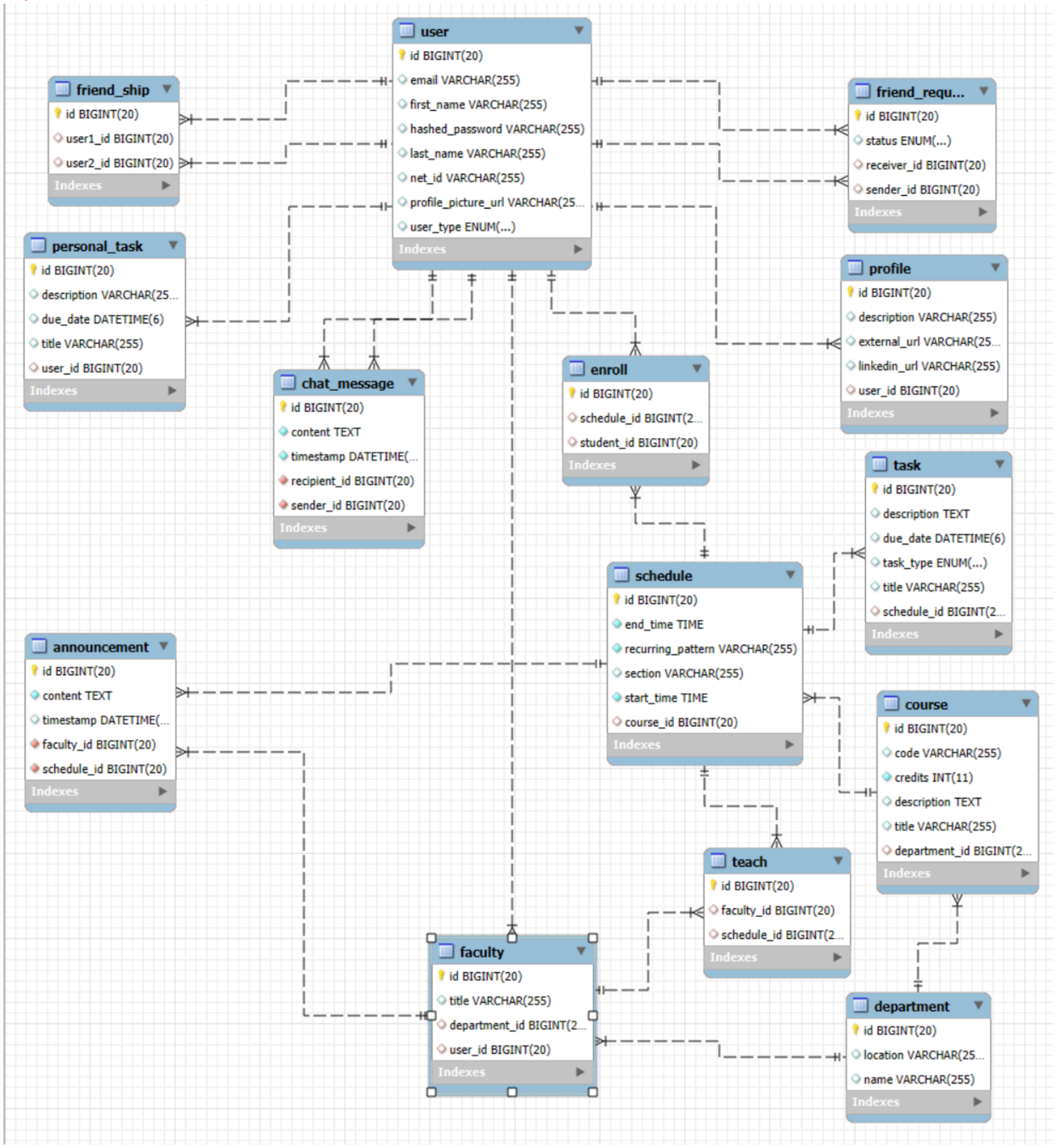
Along with that, we also use WebSocket protocol with custom handlers.

1. Chat handler: The GET handler fetches all relevant chat history between 2 users, whereas the POST handler establishes a real-time web socket between 2 users, facilitating a two-way real-time chat room between them.
2. Announcement handler: Post Handler, Update Handler, Delete Handler, which all broadcast real-time updates so that students can instantly see the changes on their ends.

Controllers:

Our database stores user data (email, hashed password, names, etc.), friendships, tasks, schedules, courses, and announcements. Users can be students or faculty, each with a profile (one-to-one). Students are enrolled - one-to-many - in a schedule (a section of a course with recurring times), can view course tasks (many-to-one), manage personal tasks (one-to-many), send/receive friend requests (many-to-many), chat with others, and receive course announcements. Faculty can view their schedules and manage announcements (post, edit, delete) for specific schedules (one-to-many).

PUT THE TABLE RELATIONSHIPS DIAGRAM on this fourth page! (Create the picture using MySQLWorkbench)


user
id BIGINT(20)
email VARCHAR(255)
first_name VARCHAR(255)
hashed_password VARCHAR(255)
last_name VARCHAR(255)
net_id VARCHAR(255)
profile_picture_url VARCHAR(25...
user_type ENUM(...)
Indexes
friend_ship
id BIGINT(20)
user1_id BIGINT(20)
user2_id BIGINT(20)
Indexes
friend_requ...
id BIGINT(20)
status ENUM(...)
receiver_id BIGINT(20)
sender_id BIGINT(20)
Indexes
personal_task
id BIGINT(20)
description VARCHAR(25...
due_date DATETIME(6)
title VARCHAR(255)
user_id BIGINT(20)
Indexes
profile
id BIGINT(20)
description VARCHAR(255)
external_url VARCHAR(25...
linkedin_url VARCHAR(255)
user_id BIGINT(20)
Indexes
chat_message
id BIGINT(20)
content TEXT
timestamp DATETIME(...
recipient_id BIGINT(20)
sender_id BIGINT(20)
Indexes
enroll
id BIGINT(20)
schedule_id BIGINT(2...
student_id BIGINT(20)
Indexes
task
id BIGINT(20)
description TEXT
due_date DATETIME(6)
task_type ENUM(...)
title VARCHAR(255)
schedule_id BIGINT(2...
Indexes
schedule
id BIGINT(20)
end_time TIME
recurring_pattern VARCHAR(255)
section VARCHAR(255)
start_time TIME
course_id BIGINT(20)
Indexes
announcement
id BIGINT(20)
content TEXT
timestamp DATETIME(...
faculty_id BIGINT(20)
schedule_id BIGINT(20)
Indexes
course
id BIGINT(20)
code VARCHAR(255)
credits INT(11)
description TEXT
title VARCHAR(255)
department_id BIGINT(2...
Indexes
teach
id BIGINT(20)
faculty_id BIGINT(20)
schedule_id BIGINT(2...
Indexes
faculty
id BIGINT(20)
title VARCHAR(255)
department_id BIGINT(2...
user_id BIGINT(20)
Indexes
department
id BIGINT(20)
location VARCHAR(25...
name VARCHAR(255)
Indexes