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Technical Specifications - LiveClass

Login Page (2 hours)

The login page will contain an HTML form with username text field, password text field, and a login button. Users will be redirected to this page from the homepage using a login button that will be placed in the top corner of the home page.

Home Page (3 hours)

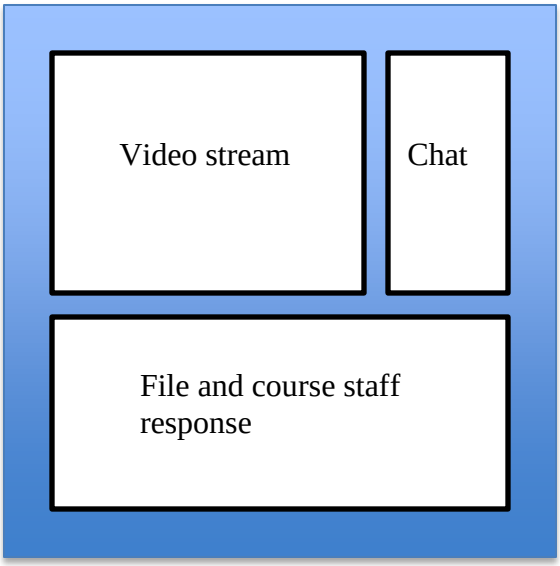
The home page will be a nicely designed page that provides an overview of the website's functionality. It will include a login button on the top.

Lectures Page (6 hours)

This page contains a list of all the public lecture live streams (live streams that can be accessed by anyone, including those without accounts). Once user signed in, this page will also display all the courses they are enrolled in.

Streaming Page (front end, 6 hours)

The main streaming page will have three major components; it will have the video stream, the chat feature on the side, as well as the file and comment section on the bottom. It will look something like this:



User Access Level (Business Logic, 7 hours)

There will be three types of users: guests, students, and course staff members. For each action, the access level of the user is checked against the database.

- A guest can only access public lectures and is not allowed to comment. Therefore, the chat section is disabled for all guests.
- Students will have the same ability as guests in addition to being able to send messages through the chat box and view lectures of enrolled classes. A student's homepage will have their enrolled class pinned at the top.
- Course staff members will have the ability to do all the above as well as the ability to control which users have access to the live streams through email invitations and access codes. Also, course staffs can start and end a live stream, answer/delete student questions and upload files.

Livestream (7 hours)

Livestream will consist of three parts – camera access, visual data parsing and serialization, and networking.

- The connection between course staff and the server is established when they start a live stream via web socket. The server will then distribute (broadcast) the video data to all validated viewers such as students in this class via web socket. Each viewer will have a socket that connects to the server.
- Camera access and visual data parsing and serialization will be implemented with third-party libraries such as JavaCV

Notifications (5 hours)

When a live stream begins, an email will be sent to the students who have access to it. This service is invoked when a request of starting a new live stream is received by the server.

Database (4 hours)

- The database will consist of a user table, a course table, a course privilege table, a login token table, and a privilege table.
- The user table will be used for validating users. It consists of user ID, username, password, first name, last name and email.
- The course table will consist of course ID, course prefix, course number, and course name.
- The course privilege table will consist of course ID, userID, and privilege ID. It is used to determine which users are course staffs of this course and which users are students.
- The login token table will be used to store user login token. Once the token expires, the user is required to login with their login credentials (username and password). This table only consists of token ID, user ID and token number

- The privilege table contains privilege ID and privilege number. A privilege number is a 32-bit integer where each bit represents a privilege. A zero for a bit means this user doesn’t have this privilege and a one means otherwise.