6.3. Detailed CSC and CSU Descriptions

The Async website is a classroom discussion board platform for classrooms. Using Typescript, React, and Supabase, there are multiple Computer Software Components (CSCs) that are made up of Computer Software Units (CSUs).

User Interface CSC

The User Interface handles the interactive page of the website. This is what the users will be interacting with when they are using the website. It uses React and Tailwind CSS to create an intuitive and user friendly design.

User Interface CSUs:

Home/Dashboard Page: Displays important user information as mini-modules; Includes a calendar preview, list of courses, upcoming assignments, etc.

Courses Page: A list of the courses that the user is enrolled in.

Calendar Page: An interactive calendar where users can view their upcoming due dates and other important deadlines.

Discussions Page: All discussions of a class, ordered from the top being most recent to the bottom being the oldest.

Settings Page: Where users can adjust account settings and preferences.

Backend CSC

The Backend CSC will be handled by Supabase. It stores important user and course metadata.

Backend CSUs:

User Table: Stores metadata about users.

Courses Table: Stores information about courses.

Enrollments Table: References user and course id’s to keep track of what courses students are enrolled in.

Assignments Table: Stores all assignments and references the course id it applies to.

Authentication CSC

The Authentication CSC is a layer of security for the website to ensure that the people are properly authenticated. This is also handled by Supabase.

Authentication CSUs

Authentication CSU: Account sign-up and login are handled with Supabase's authentication API.

6.3.1 Detailed Class Descriptions

The following are descriptions of the classes used in the Async application. These classes are in progress and are subject to change.

6.3.1.1 Discussion Class

The Discussion class represents a single discussion on the website
Fields:

- Id: Provides an identifier for the discussion thread.
- Title: Title of the discussion.
- Content: The text of the discussion.
- CreatedAt: Timestamp for discussion creation.
- Comments: Array of comments attached to the discussion.

6.3.1.2 Discussion Component

This component of Discussions displays the list of available discussions.
Fields:

- selectedDiscussion: Holds the currently selected discussion.
- Discussions: An array containing all discussions available.
- newDiscussionTitle: Creates a new discussion.
- newDiscussionContent: Creates new text for a discussion.
- newComment: Creates a new comment on a discussion.
- showForm: Shows or hides a discussion.

Methods:

- handleDiscussionClick(discussion): Selects discussion.
- handleAddDiscussion(): Allows for discussion to be viewed.
- handleSubmit(e): Processes submission for new discussion.
- handleAddComment(): Adds a comment.

6.3.1.3 Login Component

The login component is what allows users to login through the home page.
Methods:

- Login: Allows users to login using email and password in addition to a Google account.

6.3.1.4 Calendar Component

The calendar component is where users can view information about upcoming deadlines.
Methods:

- selectDate: selects a specific date box on the calendar.

6.3.2 Detailed Interface Descriptions Section

6.3.2.1 Login Interface

The login interface provides security to the website by authenticating user access through email and password.
Inputs:

- Email: Entered by user.
- Password: Entered by user.
- User clicks the submit button, processed by the backend.

Outputs:

- Authentication token: If successful login, show user access has been granted.
- Error Message: In case of invalid access(incorrect username or password, or unauthorized) .

6.3.2.2 Calendar Interface

The Discussions interface is where the users navigate to view the calendar component.
Inputs:

- User Clicks: Selects the calendar page.
- User clicks: selects a specific date in the calendar to get further information on a test or assignment.

Outputs:

- Digital Calendar: shows relevant information for the student (school, holiday, etc.)

6.3.2.2 Discussions Interface

The Discussions interface is where the users will be able to view discussions.

Inputs:

- User Clicks: Selects discussions that the user wants to be displayed.
- Discussion Creator: Opens a text box where users can create a new discussion.
- Comments Creator: Opens a new text box where users can create a new comment to be attached to a discussion.

Outputs:

- Discussions List: A list of discussions on the left of the board.
- Discussion: The discussion selected by the user to be displayed.
- Discussion Comments: Comments attached by users to the selected discussion.

6.3.2.3 Course Interface

The Discussions interface is where the users will be able to view the courses they're enrolled in.

Inputs:

- User Clicks: Selects the courses page.
- User Clicks: Selects a specific course page from the list of courses.

Outputs:

- Course List: A list of courses, displayed as button-style modules for the user to select.
- Course Page: The specific course that the user wants to navigate to and access class materials.

6.3.3 Detailed Data Structure Descriptions

6.3.3.1 Data Structures

The following are data structures associated with the Async website. There are User, Discussion, and Course data structures.

6.3.3.1.1 User Data Structure:

This contains the necessary information for a user to be stored in data.

Fields:

- userID: Unique id for each user.
- email: email for login for user.
- password: Password for login for user.
- first_name: user's first name
- last_name: user's last name

6.3.3.1.2 Discussion Data Structure:

This contains the necessary information for discussion to be stored as data.

Fields:

- Id: Unique id for each discussion.
- Title: Title for each discussion.
- Content: Content for each discussion.
- Author: The author of each discussion.
- CreatedAt: A timestamp for the creation of the discussion.
- Comments: A list of comments that were attached to the discussion.

6.3.3.1.1 Course Data Structure:

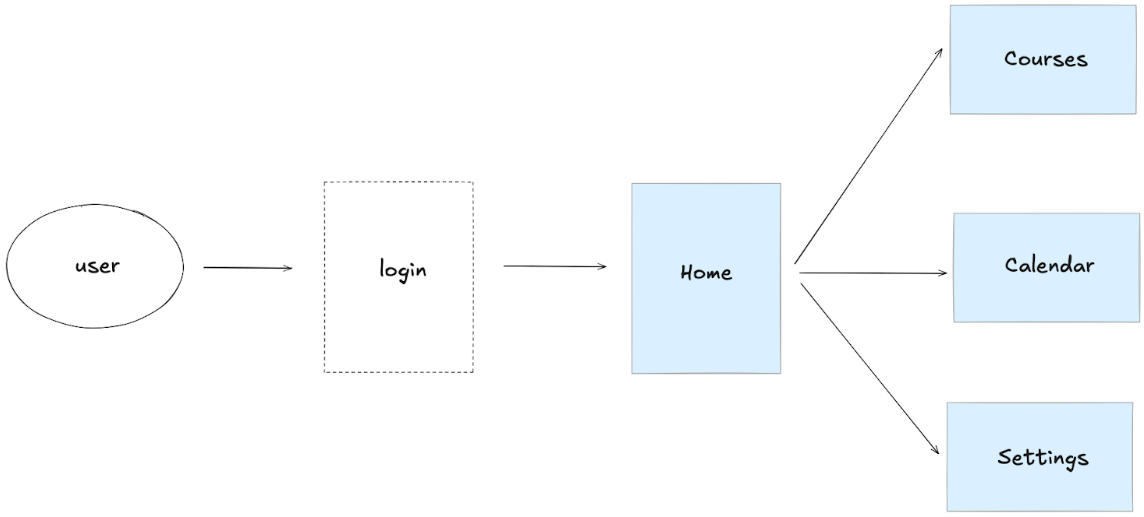
This contains the necessary information for a course to be stored in data.

Fields:

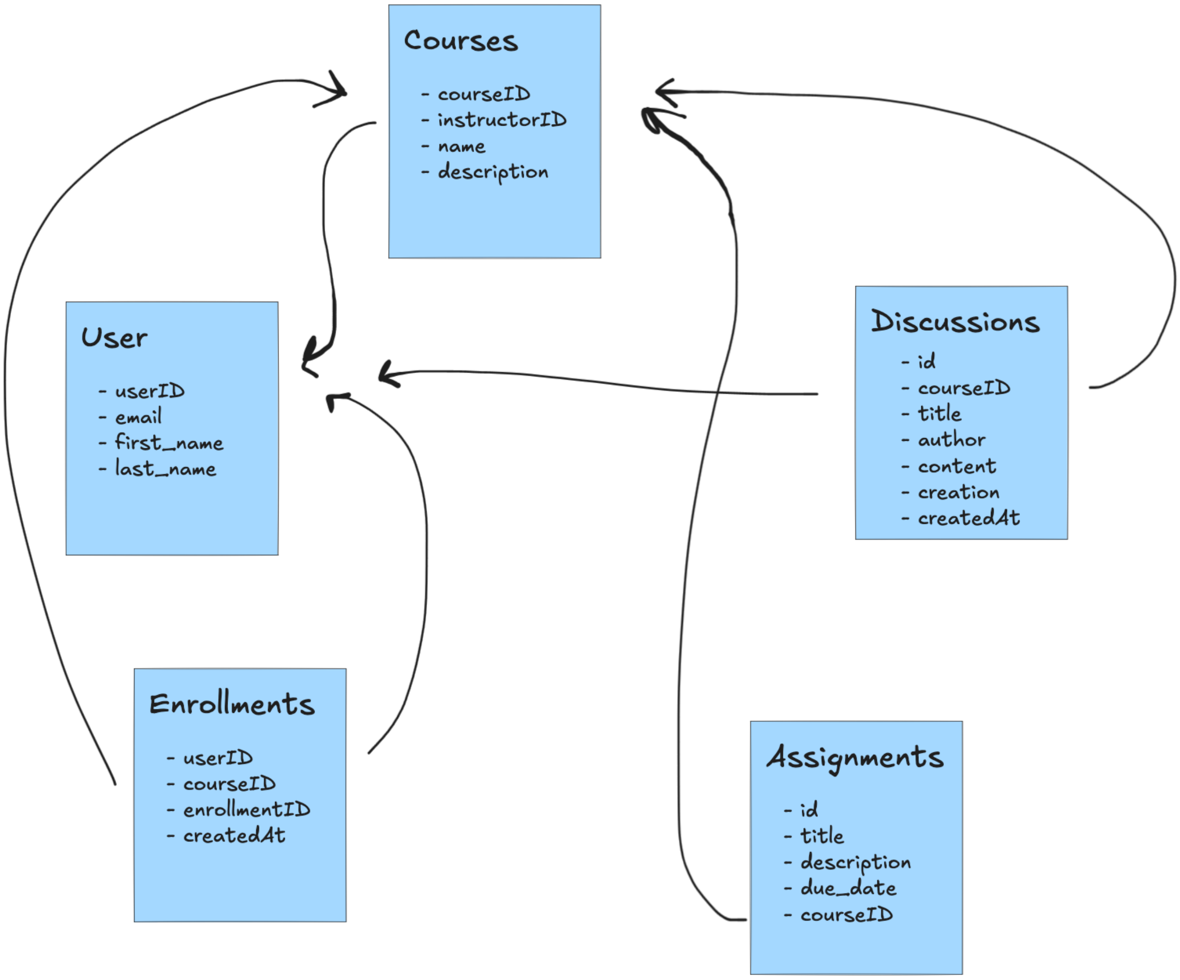
- courseID: Unique id for each user.
- instructorID: references a specific instructor's userID
- course_name: The course's name
- description: Details about the course

6.3.4 Detailed Design Diagrams Section

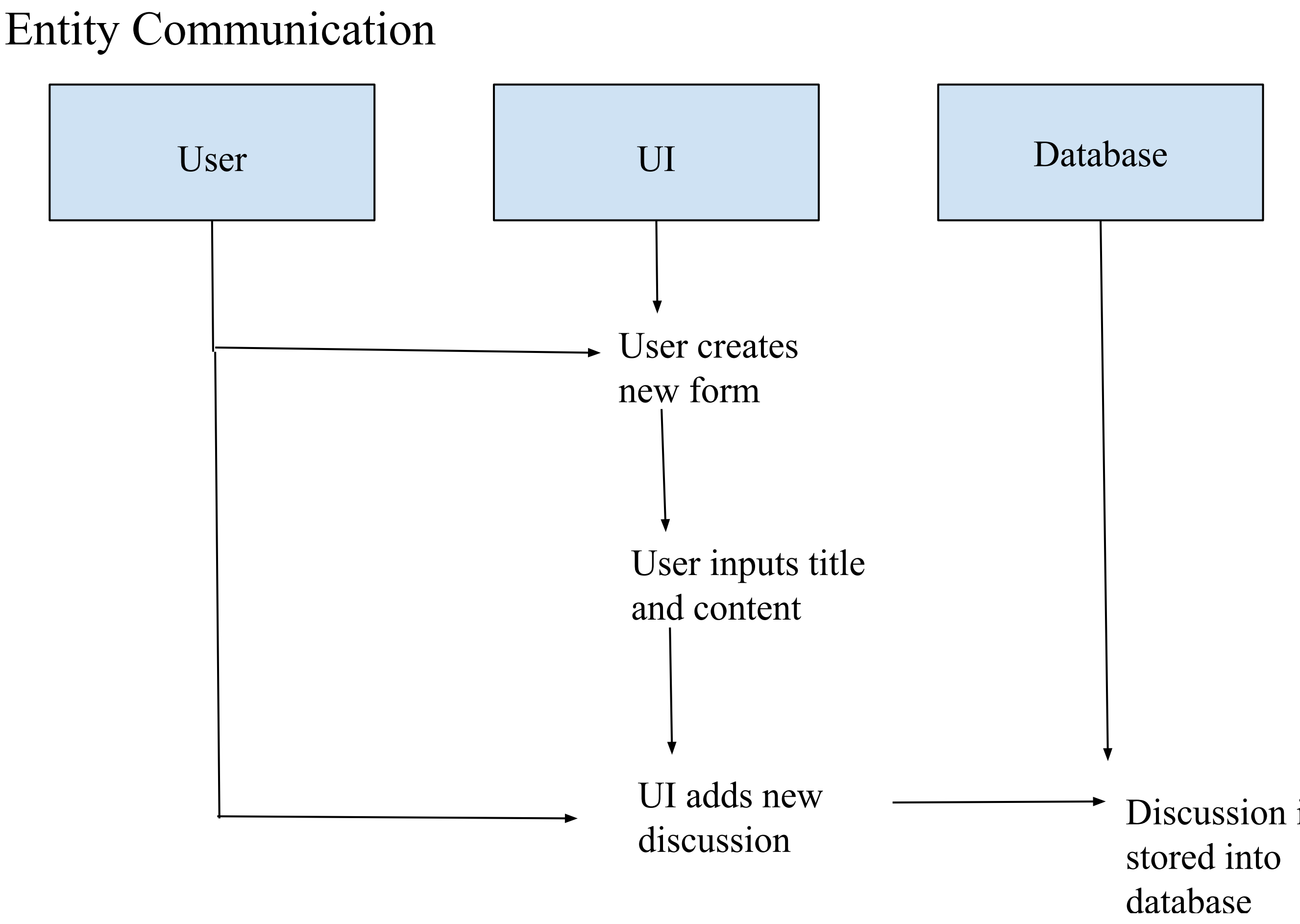
6.3.4.1 Front-End UML Diagram



6.3.4.2 Entity Database Interactions



6.3.4.3 Entity Communication

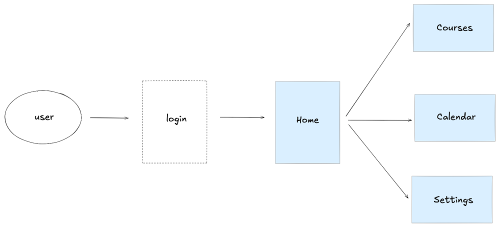


6.4 Database Design and Description Section

The database utilizes Supabase to store data.

6.4.1 Database Entity Relationship

The entity-relationship diagram illustrate the relationships between the the user, discussions, and comments.



Users:

- Users can login, see dashboard and sidebar with relevant links

Login:

- After a user logs in, they can access their calendar, courses, and discussions

6.4.2 Database Access

Database access will be securely restricted as Supabase provides a token system that only verified users can access the database.   Supabase has built in **row-level-security** for tables as well as other customizable safety preferences.

6.4.3 Database Security

Data fetching is done securely through an API and prevents sensitive database information from being exposed. We leverage Supabase's security rules and data encryption to create a secure environment.