METU

NORTHERN CYPRUS CAMPUS

# CNG 495 Cloud Computing

## Fall 2025-2026

## Capstone Project Progress Report: StudyMate Mobile Application


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# 1. Project Description

The aim of our project is to develop a Flutter-based mobile application, **StudyMate**, which will allow students and teachers to manage their school or university work easily through a practical and easy-to-use interface. With the help of this project, users will be able to schedule their study or work sessions with ease, have important notes in one place, along with a help forum that will allow users to post questions and send message requests to ask for help from peers or teachers.

This project aims to help students and teachers stay organized, consistent, and overall productive throughout the span of their academic journey. This project will be built using **Flutter** and **Supabase**. The mobile interface is developed with Flutter and is designed to run on Android devices. The backend operations, such as data storage, authentication, and synchronization, are managed by Supabase. The cloud-based system provides users with easy accessibility to their data safely on any device. Collectively, these technologies will make StudyMate a resourceful, effective, and convenient tool that allows students to better manage their studying and time management in a cloud-based, contemporary format.

# 2. Cloud Delivery Models

## 2.1 SaaS (Software as a Service)

Supabase Auth is utilized to provide ready-to-use authentication, allowing users to register and log in securely. A unique UUID is assigned to every user, linking all relevant data (schedules, notes) to that specific account. This acts as our SaaS component as it eliminates the need to build and maintain a custom authentication server.

## 2.2 PaaS (Platform as a Service)

We utilize Supabase Edge Functions to execute backend logic. These functions run in the Supabase-managed environment, acting as our Platform as a Service, allowing us to execute features without maintaining our own server infrastructure.

## 2.3 IaaS (Infrastructure as a Service)

All application data is stored in Supabase PostgreSQL. This data is physically stored on Supabase Storage (backed by AWS S3). This layer represents the Infrastructure as a Service component of our architecture.

# 3. Diagrams

## 3.1 Use Case Diagram

The figure below illustrates the interactions between the Actors (User) and the System (StudyMate/Supabase).

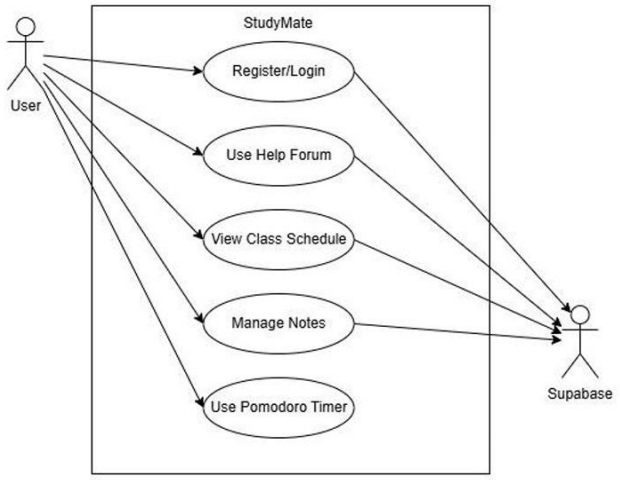


**Figure 1:** Use Case Diagram

## 3.2 Data Flow Diagram

The context-level diagram below shows how the user interacts with the Flutter app and its communication with the Cloud service.

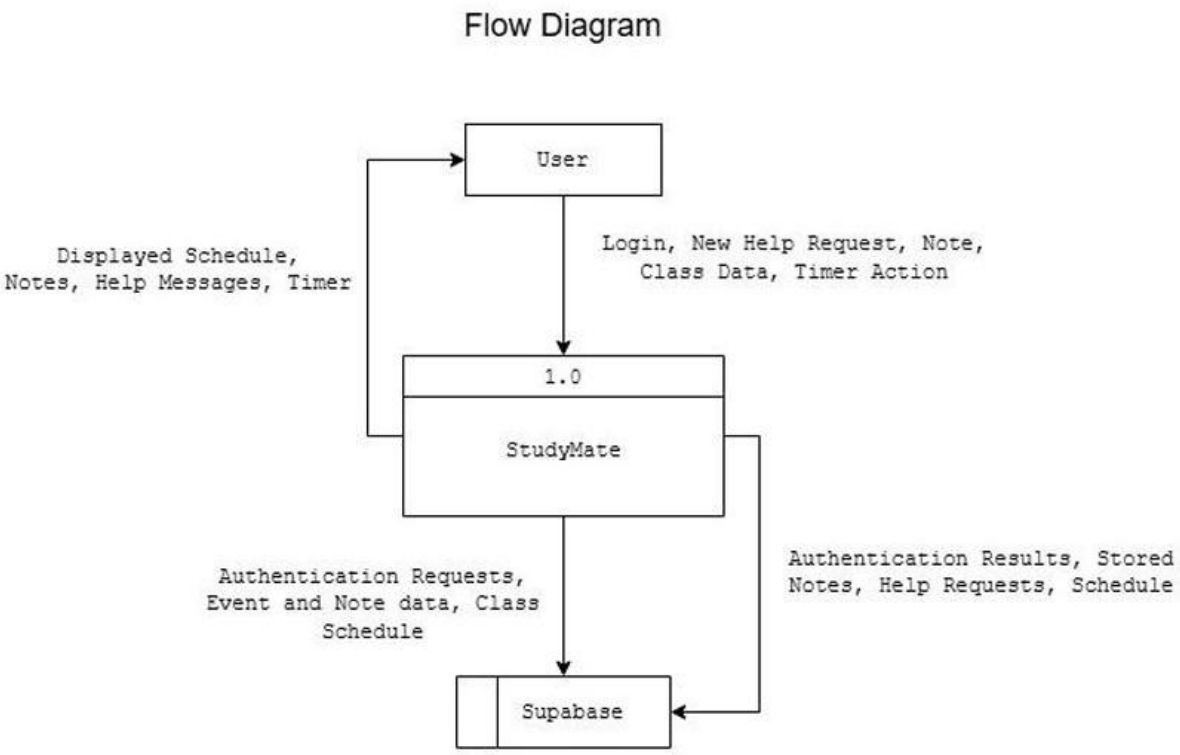


**Figure 2:** Context Level Data Flow Diagram

Now, the Level 1 data flow diagram is illustrated below which shows how different functions

of our project handle data, like registering a new user account, using the notes forum or

creating a Pomodoro timer.

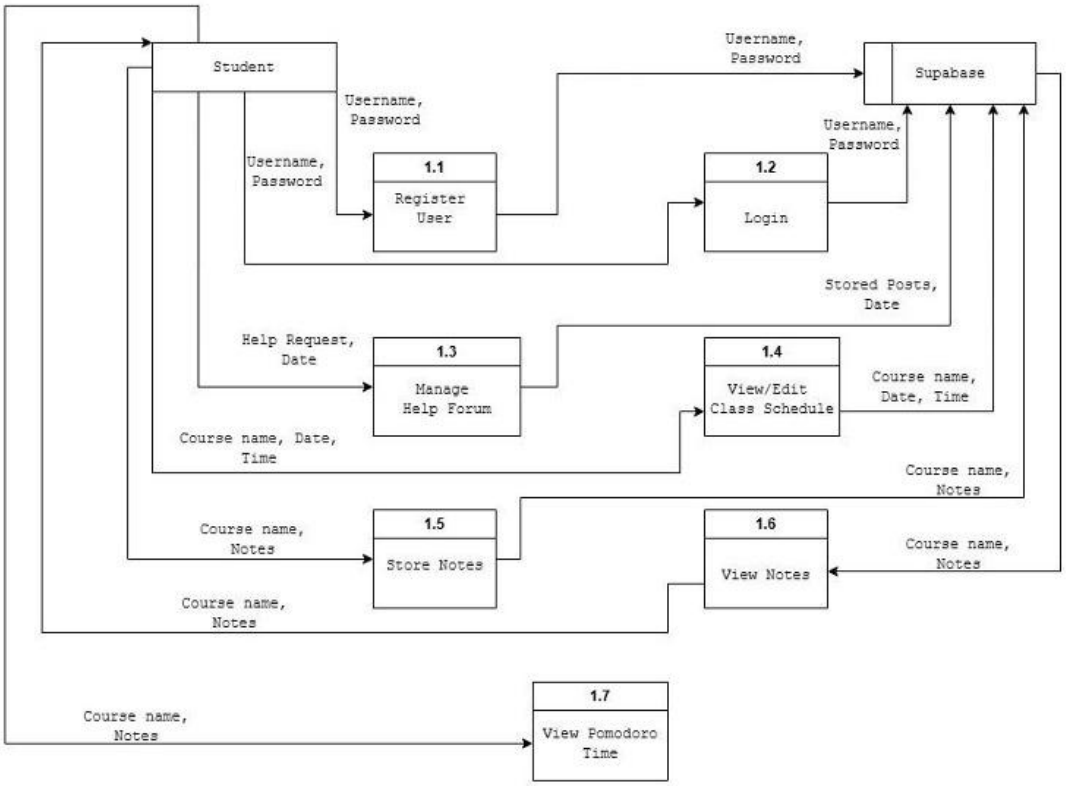


**Figure 3:** Level-1Data Flow Diagram

## 3.3 Logical Database Requirements

The relationship between users, schedules, notes, and Pomodoro sessions is outlined in the Entity-Relationship logic below. The “Study-mate” application will require a relational database to store and manage various types of data related to users including help requests, class schedule, notes and information about the pomodoro session. The logical requirements for the database are based on the discussed app's core features. These relationships are shown in the diagram below.

# 4. Milestones Achieved

## 4.1 Timeline of Completed Work

The following tasks have been completed in accordance with the ODTUclass weeks:

**Week 7 (Nov 11 – Nov 17):**

- Initialization of the GitHub repository.
- Setup of the Flutter development environment.
- Design of the initial UI for the Welcome and Sign-Up screens.

**Week 8 (Nov 18 – Nov 23):**

- Implementation of Authentication (Login and Sign-up logic).
- Integration of Supabase Auth SDK.
- Development of the Dashboard (Home Screen).
- Implementation of the Pomodoro Timer module (UI and Logic).

**Week 9 (Nov 24 – Nov 30):**

- Implementation of the Class Schedule module.
- Creation of the schedules table in Supabase SQL Editor.
- Integration of CRUD (Create, Read, Delete) operations for the Schedule.

## 4.2 Work Completed by Members

**Faiez Rashid:**

**Class Schedule:** Developed the scrollable grid view for the weekly timetable. Implemented the backend connection to Supabase, allowing users to add courses (Course Code, Room, Day, Time) and delete them.

**Dashboard Integration:** Integrated the grid-based menu system on the Dashboard to navigate between features.

**Arisha Ahmad:**

**Authentication UI:** Designed the Login and Sign-up screens, ensuring consistent branding (colors and typography) across the application.

**Project Structure:** Set up the initial Flutter directory structure and managed the inclusion of necessary dependencies (supabase_flutter, google_fonts, etc.) in pubspec.yaml.

**Pomodoro Timer:** Successfully implemented the timer logic, allowing users to start, pause, and reset study sessions. The UI includes a circular progress indicator for visual feedback.

**Dashboard Integration:** Integrated the grid-based menu system on the Dashboard to navigate between features.

## 4.3 User Interface

In this section of the report, we have added the screenshots of our Mobile application along with a small description of the functionalities of the specific features implemented. For our application, we have utilized a red/white theme to make it consistent with our METU environment.

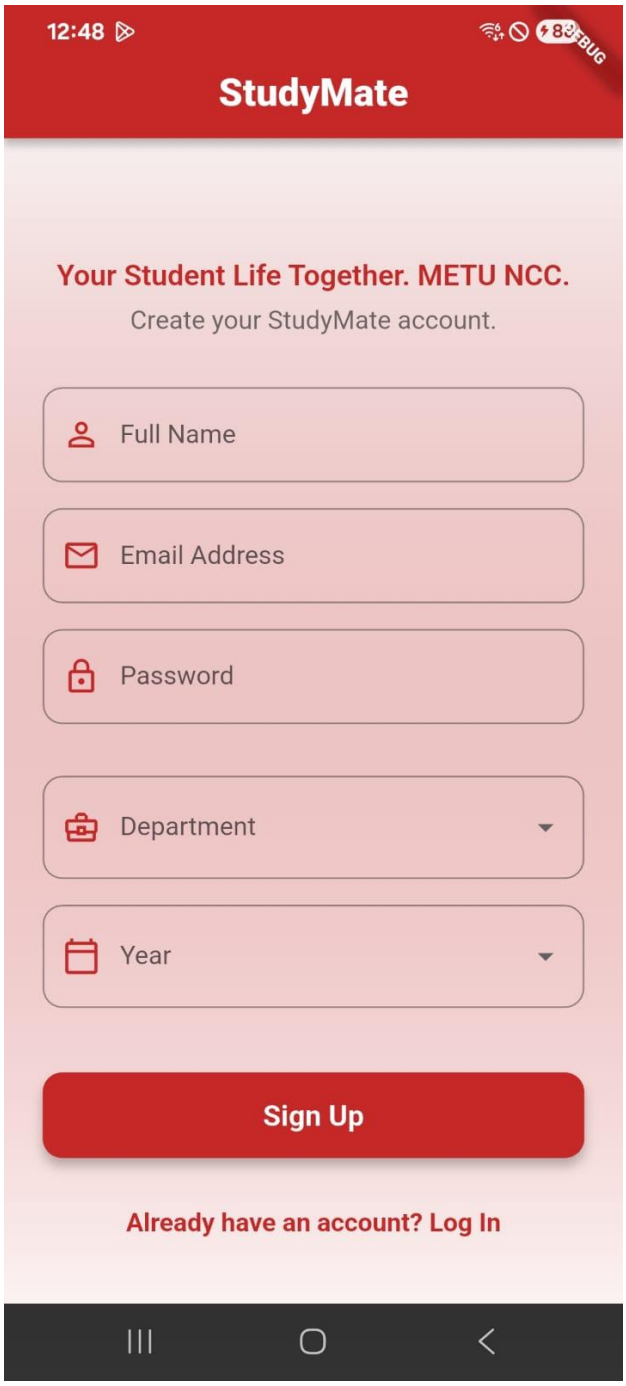


Figure 1 Sign Up Screen

The figure above shows our Sign-Up Screen which will be shown when the user initially opens the application. This asks the user to enter the necessary details including their full name, email address, a password which should be at least 8 letters long, and then select their department from the drop down menu and also their academic year.

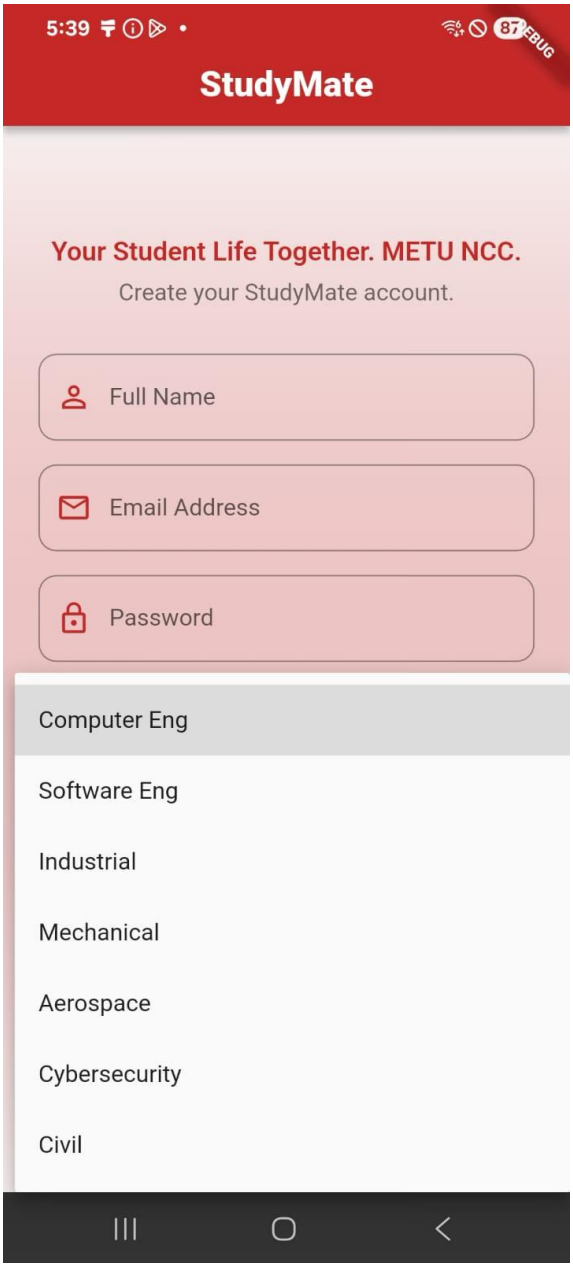


Figure 2 Drop-down Functionality

The figure above shows our drop down functionality for selecting the department and their academic year.

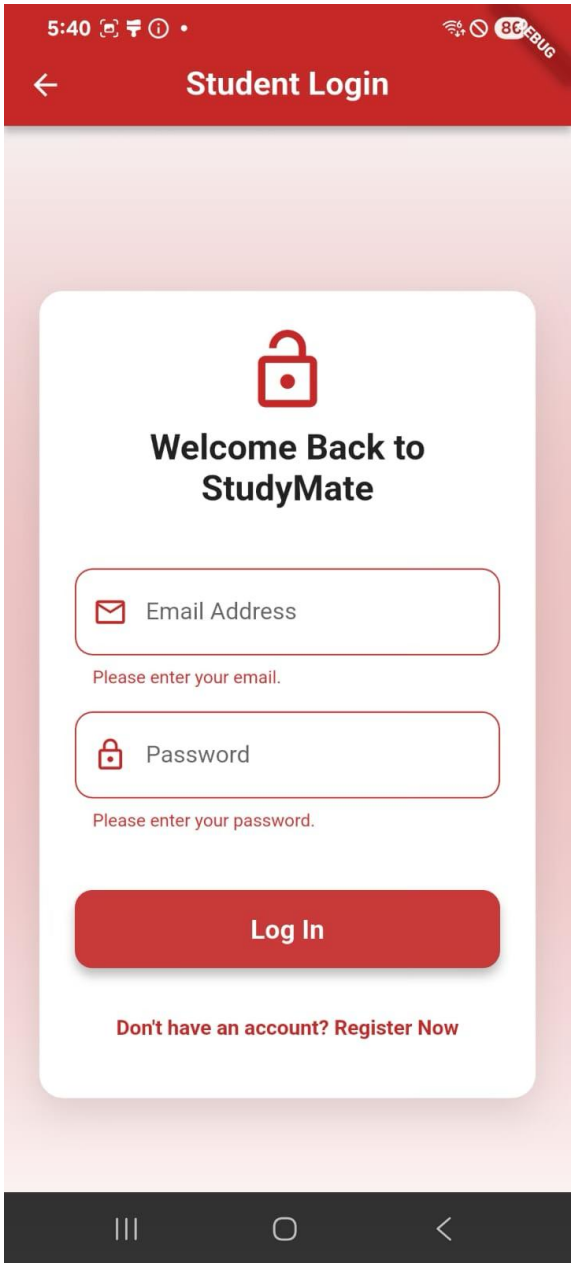


Figure 3 Login Screen

The figure above shows our login screen, which will appear to the user after they have already created an account.

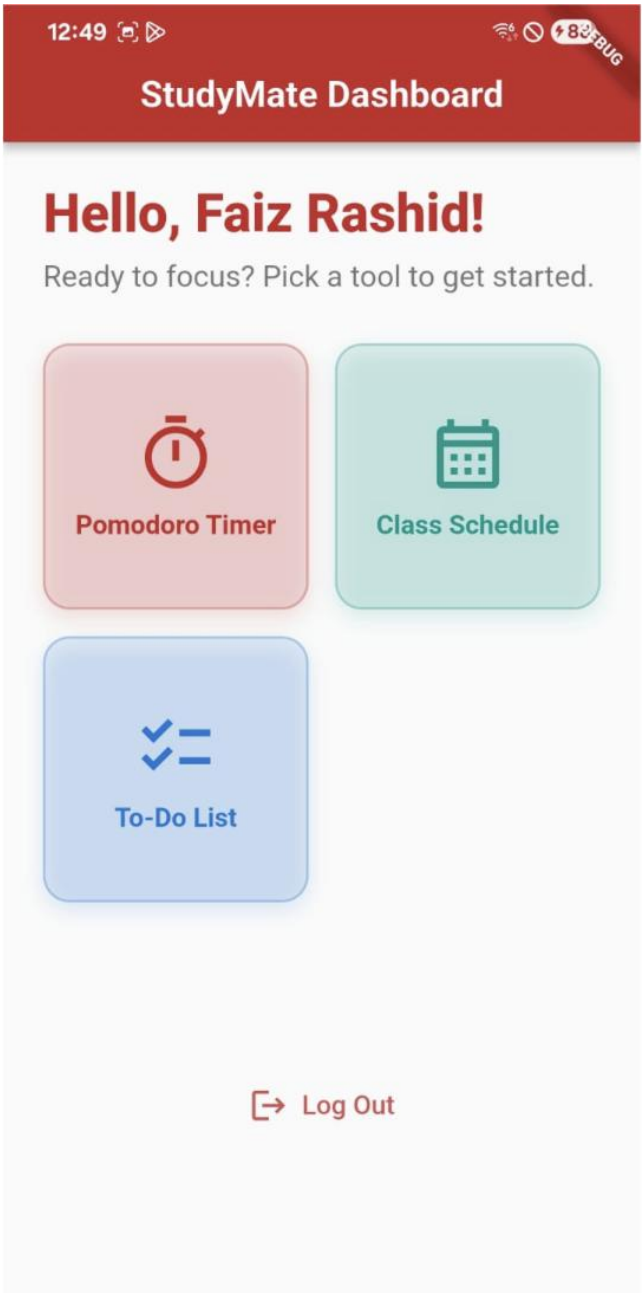


Figure 4 Dashboard

The figure above shows our dashboard that the user will be presented with when logged in, it has the name of the user along with the option to choose one of the 3 features that have been implemented so far as icons.

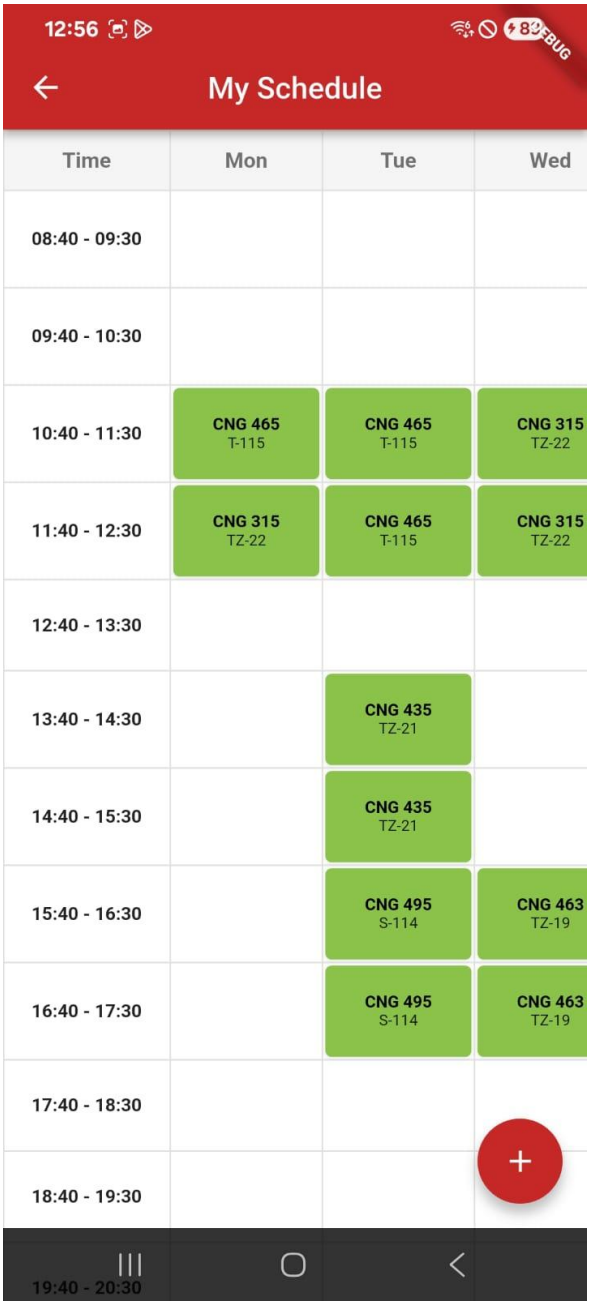


Figure 5 Class Schedule

The figure above shows our class schedule section in which the user is able to add the course name and its timing along with the classroom number. This theme is consistent with our CET system.

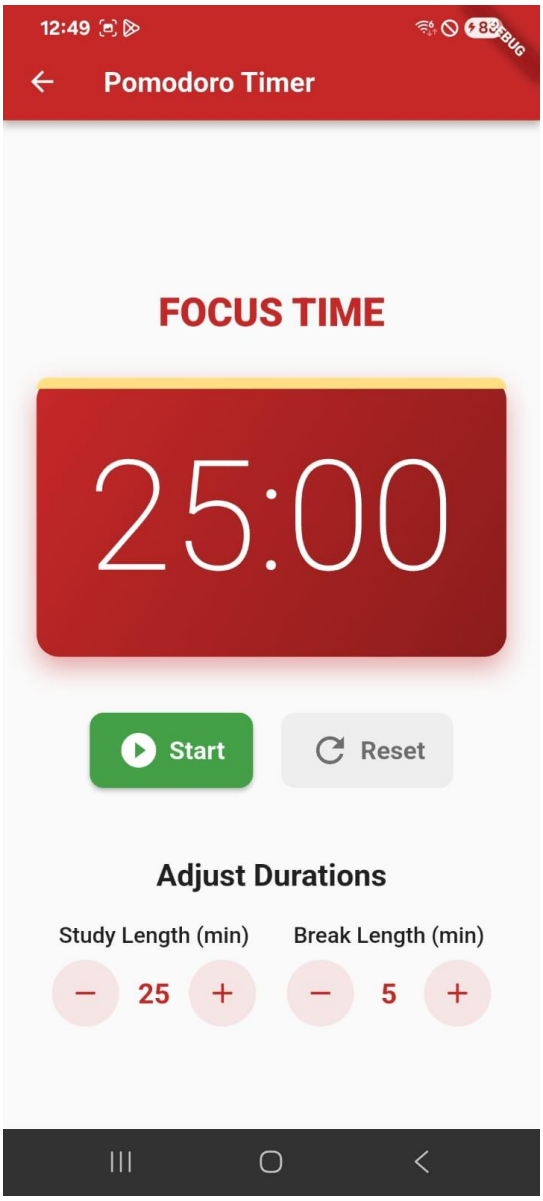


Figure 6 Pomodoro Timer

The figure above shows our Pomodoro timer implementation as the screenshot shows, the user can adjust the duration of the study length and the break and even start/pause and reset it at any given instance.

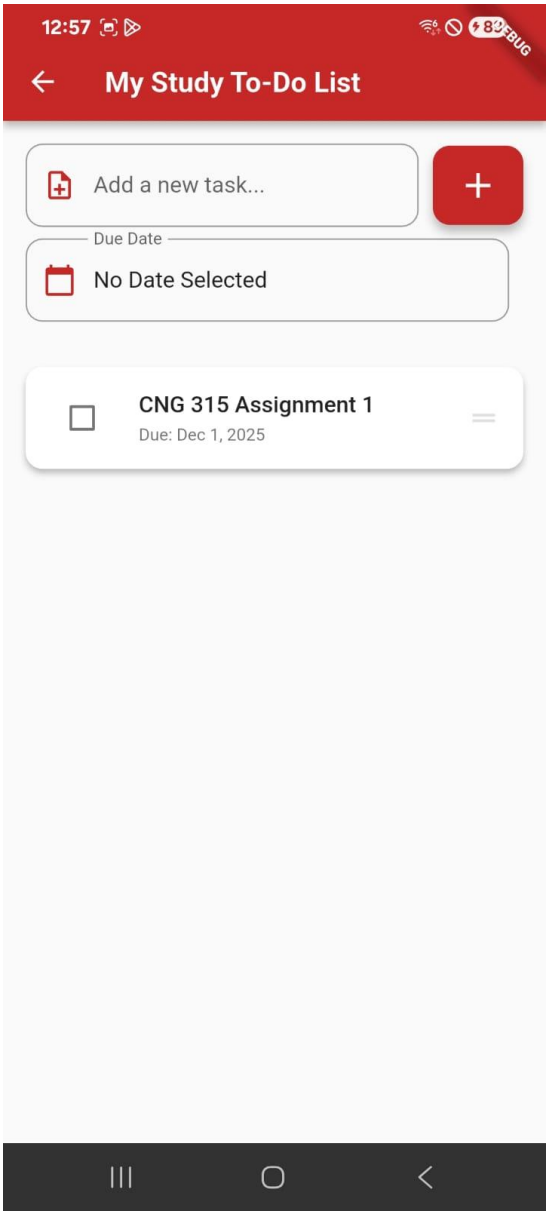


Figure 7 To-do List Screen

Lastly, the figure shows the to-do list screen implementation in which the user can add a new task along with the date its due.

# 5. Supabase Schema

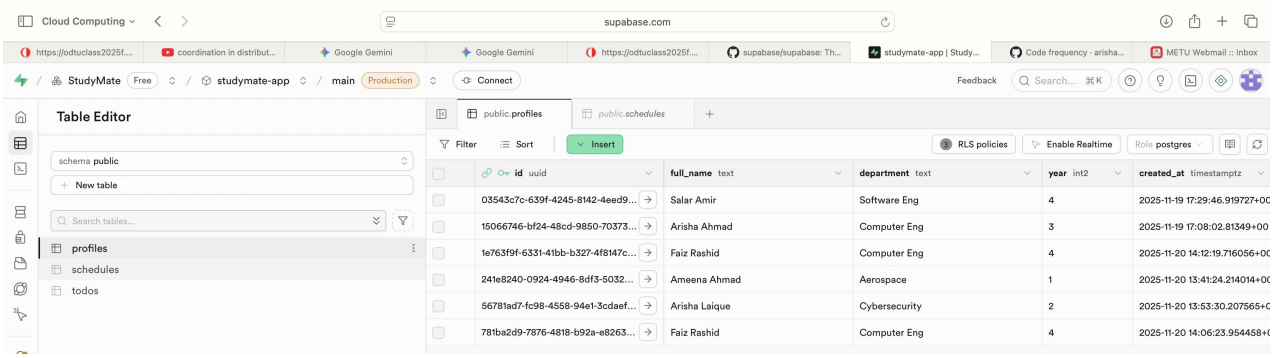


Figure 8 Database Table

The figure 8 shows how the tables are organised in our database, for now as per the features we have implemeted we have the profiles, todos, and schedule table.

# 6. GitHub Repository

All written code, including the Flutter frontend and SQL backend scripts, has been pushed to our team repository.

**Repository URL:** https://github.com/arishaahmad/study-mate-application.git

# 7. Milestones Remaining

The following features remain to be implemented or finalized in the upcoming weeks:

**Week 9:**

- **Help Forum (Faiez Rashid):** create the database table for posts and implement the chat interface.
- **Notes Module (Arisha):** Implement local storage or cloud storage for text-based notes.

**Week 10:**

- **File Uploads:** Enable photo/PDF uploads for the Help Forum using SupabaseStorage buckets.

**Week 11:**

- **Notifications:** Implement local notifications for the Pomodoro timer completion.
- **UI Refinement:** Polish the overall app aesthetics.

**Week 12:**

- **Testing & Documentation:** Final bug fixes and preparation of the Final Capstone Report.

# 8. References


[1] Middle East Technical University Northern Cyprus Campus. (2025). *CNG 495 Capstone project guidelines*.

[2] Supabase. (n.d.). *Supabase documentation*. https://supabase.com/docs

[3] Flutter. (n.d.). *Flutter documentation*. https://flutter.dev/docs

[4] PostgreSQL Global Development Group. (n.d.). *PostgreSQL documentation*. https://www.postgresql.org/docs/