COMP3011J Mobile Computing 2023-2024

Beijing-Dublin International College

Project Alpha

StudySpace

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1 Project Progress Introduction

The StudySpace application has reached its alpha submission milestone in alignment with the previously outlined project plan. In this phase, significant progress has been made, encompassing the creation of the database, user authentication for registration, login, and logout, as well as the storage of relevant data in the database. Additionally, the initialization and retrieval of study room data, the implementation of search and query interfaces, and the design of the user profile interface have been successfully completed. The subsequent sections will provide a detailed overview of the accomplished work. Specific images are shown in the PowerPoint.

2 Accomplished Work

2.1 Database Development

The database system for the StudySpace application was developed using **SQLite**, as taught in the lecture. The entity-relationship (ER) diagram of the database is shown in Figure 1. The StudySpace application's database development is a critical component that enables user registration and authentication, manages study room data, and tracks study time. It offers a solid foundation for the application's core functionalities.

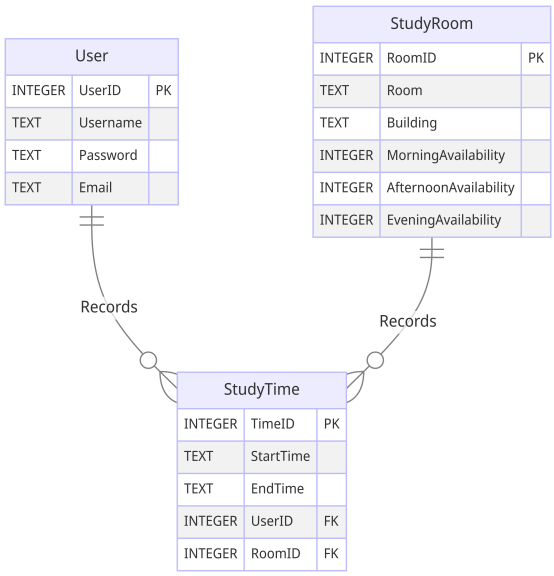

Figure 1: Entity-Relationship Diagram of the StudySpace Database

2.1.1 Database Schema

The database consists of three primary tables: *User*, *StudyRoom*, and *StudyTime*. Each table plays a crucial role in managing different aspects of the application:

- ***User*** Table: This table is responsible for user management. It stores user account information, including their username, email, and password. The email field is unique, ensuring that each user has a distinct identifier.
- ***StudyRoom*** Table: Here, information about available study rooms is stored. Key attributes include the room number, building location, and availability during morning, afternoon, and evening time slots. If the value is 1 it is available and a value of 0 is not available.

- ***StudyTime*** Table: This table records user study sessions. It includes fields for the user ID, room ID, and timestamps representing the start and end times of each session.

2.1.2 Key Database Operations

The *DBUtil* class, an extension of *SQLiteOpenHelper*, offers a comprehensive set of functions that facilitate critical database operations, ensuring the efficient management of user accounts, study room data, and study time sessions.

- **User Management:** The database facilitates user registration, login authentication, and retrieval of user-specific information. New users can create accounts with unique email addresses and secure passwords, while the system verifies login credentials against stored data.
- **Study Room Management:** The database supports bulk insertion of study room data, simplifying the initial setup and updates. Users can retrieve a list of unique buildings and assess the availability of classrooms in a specific building at different times of the day.
- **Study Time Tracking:** This feature counts and reports the number of study sessions per user, aiding self-monitoring and productivity.

2.2 User Authentication and Management

The StudySpace application successfully implements a comprehensive user authentication and management system. In order to access the application, users need to log in. Users can register for an account, log in securely, and the database checks email uniqueness during registration and verifies user credentials during login. Once logged in, users can access their personalised profiles where they can view their user information, including their username and email address. In addition, the application provides a simple logout mechanism that allows users to return to the login or registration page.

2.3 Main Interface Layout

The StudySpace application features a well-structured main interface with three primary sections: “Search,” “Analyse,” and “Profile.” These sections are readily accessible via the BottomNavigationView, enhancing user navigation. The *BottomNavigationView* serves as the central hub for transitioning between these sections, creating a user-friendly experience. The clean and visually appealing design simplifies interactions, enabling users to easily explore the application’s core functionalities. The application’s color scheme is based on the logo’s unified colors, ensuring a cohesive and visually appealing design. Currently, the layouts for “Search” and the fundamental structure of “Profile” have been successfully implemented, contributing to a user-friendly and aesthetically pleasing interface. In the “Profile” interface, users can access informative content by clicking the info icon, which triggers a dialog displaying relevant details, making the app more informative and engaging.

2.4 Study Room Search Functionality

The StudySpace application enables users to search for available study rooms based on the selected building and the current time. By querying the database, the application provides users with a curated list of suitable study rooms for their study sessions. Users can access and review all the currently available study rooms, enhancing their ability to find the ideal study space to meet their needs. Additionally, on the search main interface, users can view the current availability count of study rooms for selected buildings, facilitating quicker decision-making for their study sessions.

2.5 Enhanced User Experience with Animations

In order to further enrich the user experience, the StudySpace application has incorporated a selection of Lottie animations. For instance, when a user enters the application, a Lottie animation is displayed to attract their attention and disappears after 5s to jump to the main interface. The "Search" interface has also introduced some animation in the background. These animations not only make the application visually appealing but also add a layer of interactivity and engagement for users, making StudySpace a dynamic and user-centric platform.

3 Revised Plan

During the actual design and development process of the database and the Android application, I have identified the need to adjust the initial project plan outlined earlier. The "Friends" feature, as initially conceived, appears to be relatively complex and might not provide substantial utility to the core functions of the StudySpace application. Features such as friend rankings, medal achievements, and other social aspects were primarily intended to motivate users in their study habits.

In light of this, I plan to de-emphasize the "Friends" functionality and reallocate resources to enhance the "Study Time Analysis" component of the application. This adjustment will involve creating a more robust feature for analyzing and visualizing a user's study habits and performance over time, with the aim of providing users with valuable insights and motivation to improve their study routines. This enhanced feature will employ various visualization techniques to present data in an accessible and motivational manner.