



EasyStudy – Your Ultimate Study Companion

**COM7506 Smart Phone Apps Development
Group Assignment Report**

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PART I. INTRODUCTION

1.1 Project Introduction

For students who have to learn a large amount of concepts in school, there are several problems to effectively learn the materials. Firstly, we may find it difficult to achieve good results just by reading over and over again and therefore need a systematic study method and platform where we can write down our notes. Secondly, given the amount of materials to study, it may be hard for us to keep track of all our notes if we use a paper note-taking system. Lastly, carrying physical notes around may cause inconvenience as we travel around regularly. In these cases, the ability to learn independently, effectively, and conveniently becomes particularly important.

In this project, we explore various existing smartphone applications that attempt to solve the problem outlined above, and develop an assistive learning smartphone app that sets goals and tracks the user's learning process in hopes to make self-study easier. In particular we have designed a flashcard memory app that incorporates several functionalities to make memorization a long-term habit, and ultimately help with learning.

1.2 Platform

Our app is targeted towards Android users, and it is developed using Android Studio.

1.3 Objectives

Our app aims to help users create a more productive and enjoyable learning environment. In particular, we aim to alleviate the following problems:

1. The boring process of memorization and the difficulty of sticking to the learning journey over time
We believe that friend circles can be an effective way to improve this problem. Sharing cards with friends who have the same learning needs can make users feel that their learning process is not isolated. Especially at a time like the present when it is less convenient to study together offline, creating a mini study room of sorts using a flashcard study format can help users to study more consistently.
2. Not being able to memorize information effectively
We include detailed statistics on users' learning history that allows users to understand their strengths and weaknesses in their learning. The use of a daily sign-in system and the display of learning hours enhances the user's sense of achievement.

After a brief research on flashcard memory apps, we found that there is a lack of flashcard apps on the market that combine the friend function with a statistical curve. The details of our background research are illustrated below.

PART II. BACKGROUND RESEARCH

In this section, we conduct a series of background research on existing apps focused on learning. In particular, we explore three apps – Anki Memory Card, Quizlet, and Flashcard – and analyze their pros and cons which serve as inspiration for our own app.

2.1 *Anki Memory Card*

Selling Points

In terms of learning new cards, this app is set up with a variety of learning methods. 'Active learning' is based on an algorithm that uses diverse filtering criteria to autonomously create a learning programme for the user, 'Memory level', 'Answer status' and 'Tagging colors' are based on the user's learning history, user feedback on the difficulty of the answers and user-definable tagging colors respectively as an individual learning approach. When it comes to memory modes, the app has three options: long term memory, short term memory and blitz learning. In addition, the number of cards and the order of study can also be customized. This app offers an online deck library where users can download different decks as well as upload their own created decks. The online decks need to be purchased with virtual coins, but the corresponding decks will then have a higher level of integrity and aesthetics. Also, the 'statistics' fragment displays users' learning data, such as the total learning time, attendance status, mastery statistics, as well as a basic prediction of future learning amount.

Pain Points

One of the drawbacks of this app is that the to-do list for today is displayed on the home page as a unit of cards, but it is possible that these cards may belong in many different folders, which makes it not so clear to the user what tasks are to be completed today. In the home interface, all the memory banks created are displayed here. Although those cards containing unlearned cards are presented at the front, the app lacks a search function that would allow the user to better find the specific learned cards in the large number of memory banks.

2.2 Quizlet

Selling Points

Unlike previous applications, Quizlet is a flashcard application that focuses on different courses and textbooks, allowing users to search for course cards created by others based on the name of the school or search for textbook answers based on the book name. Users can also create their own classes and invite other users to share the decks they have created. Quizlet offers a variety of learning modes, including classic flashcard flip mode, left and right swipe mode, matching mode and fill-in-the-answer mode. This makes the learning process more interesting for the user.

Pain Points

Quizlet contains only simple statistics, such as the number of words that are "under study", "unlearned" and "mastered". It also lacks ways for users to see their learning days on the app or to clock in and out, which makes the app less supervisory. A relatively obvious drawback of this app is that although users can find decks created by others online, there is no way to interact with them by leaving comments. Comment function can enable users to exchange study methods, which would make recitation less difficult and more intriguing by exchanging. Moreover, most of the public decks are simple and the number of words is limited, making this community function not as useful as it could be.

2.3 Flashcards

Selling Points

The Flashcards app is a bit of a combined version of the previous two apps, offering a wealth of public cards, a variety of recitation modes, different memory length options and an additional manual marking function. In addition to downloading public cards from the internet, the app also allows users to import pdf, image or csv files to create flashcards. What's more, users can create memory flashcards to remind them of important dates with the app. Users can set whether to repeat or not, whether to pop up reminder notifications at certain times, and even add notes and images.

Pain Points

In terms of statistics, however, Flashcard only allows the user to observe the review data on a card-by-card basis, including when it was created and when subsequent learning occurred. But the app does not have a macro record of the user's overall learning data, nor does it have numbers to remind the user of the amount of tasks that need to be completed today. Another relatively minor weakness is the complicated process of importing flashcards from other format files. Although the app includes a detailed tutorial, the 20-plus steps make the import much more likely to fail and users may give up on the import because of the overly lengthy tutorial.

2.4 Inspirations for Our App

Inspired by these three apps, we decided to create a well-organized flashcard app with a reminder function. Users can include what they need to remember on separate flashcards depending on their needs. A comprehensive file system allows users to find what they are looking for in a wide variety of folders. Considering the process of memorization individually can be slightly tedious, we also want to set a friend-sharing function to make the learning more intriguing. Our sharing functions are not reflected in online public resources like GMAT or CFA, but are concentrated in small circles of friends who will have some specific common goals. What's more, the statistics function was one of the key features we set up from the start. With these conclusions in mind, we have developed a new anki-card memory app.

PART III. FRONTEND APP DESIGN & FEATURES

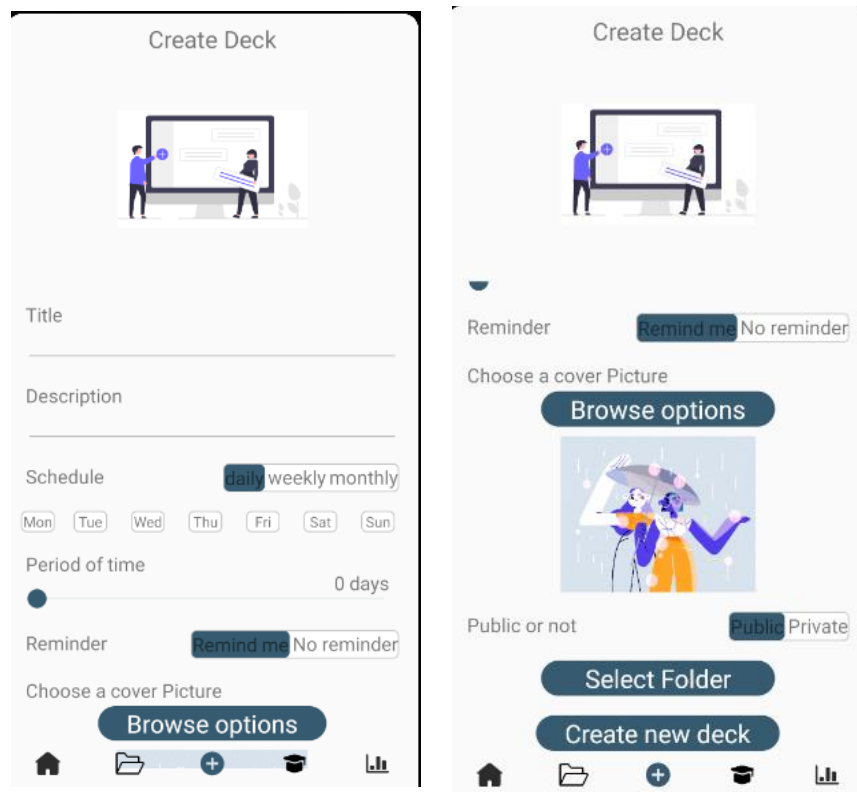
3.1 Major Functionalities

Our app, EasyStudy, is designed to make it easy for users to learn subjects they are interested in at any time through their mobile phones. On purpose to increase users' enthusiasm for studying, we specially designed several functions:

1. Daily Attendance system to help users develop learning habits;
2. Allow users to customize their daily learning tasks freely, and remind users on time to help users keep with their learning plan;
3. Friends system in which users can add other users as friends and share their public learning decks, so as to help users discover new knowledge and find partners learning together.

3.2 Login & Registration

The first interface to enter our App is the login/registration page. Users can enter their username, email address and password to access their account. For new users, they only need to set up their username, email address and password to successfully register their account.



3.3 Navigation Bar

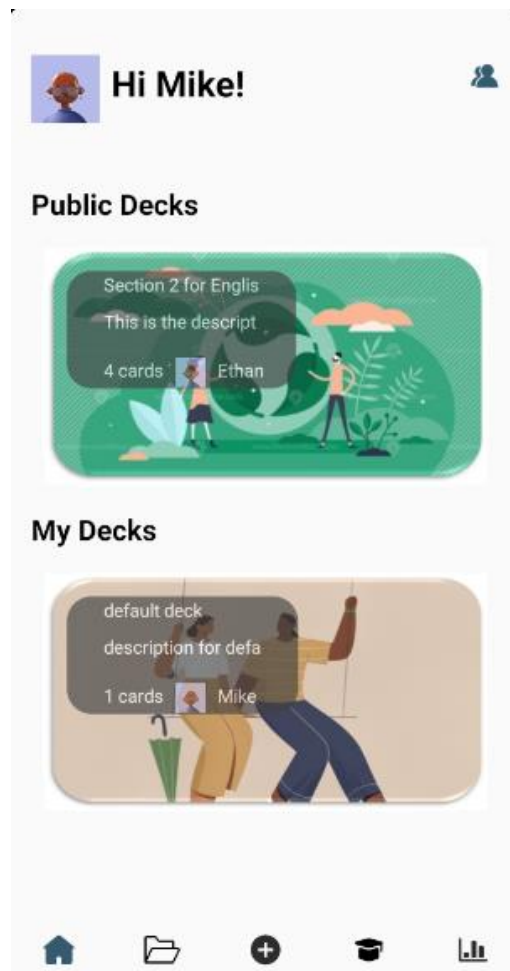
We have set five main interfaces in our app ,which are Home, Folder, Add, Study and Statistics. The navigation bar is designed to help users switch between these major sections of the app.

We can switch to other interfaces by clicking on the navigation bar. To remind users which interface they are at, the icon of the chosen interface will be shown in different colors.

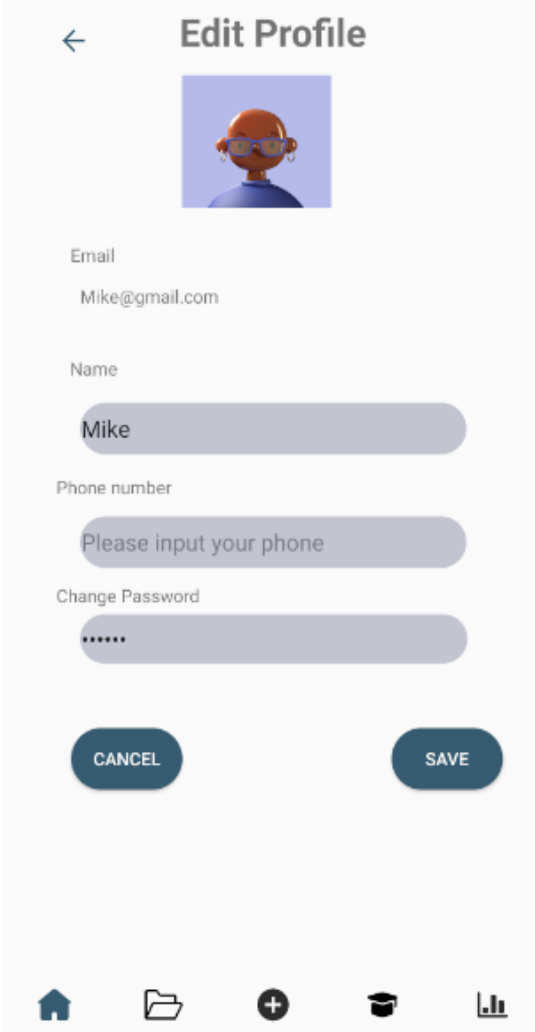


3.4 Home

- After login, the user will see their Home interface. The upper left corner of the Home interface is the default profile picture. The upper right corner leads to users' friend list. As we can see, the user's friends' public learning decks are displayed in the interface, titled Public Decks. Users can swipe through their friends' learning decks or click "see all" to browse all their friends' learning folders. The user's friends also have access to the user's public learning folders. Friends-systems can make users learn from the public learning folders together to make learning more interactive. Considering that users have different acceptability for sharing and joint learning, users can set the deck to be private when creating the deck. Unlike the public decks, friends do not have the permission to check the private decks but only the users themselves. For users' convenience to review all their own decks, we set a My Decks system to have both their own public and private decks in it, and this is designed just below the Public Decks.

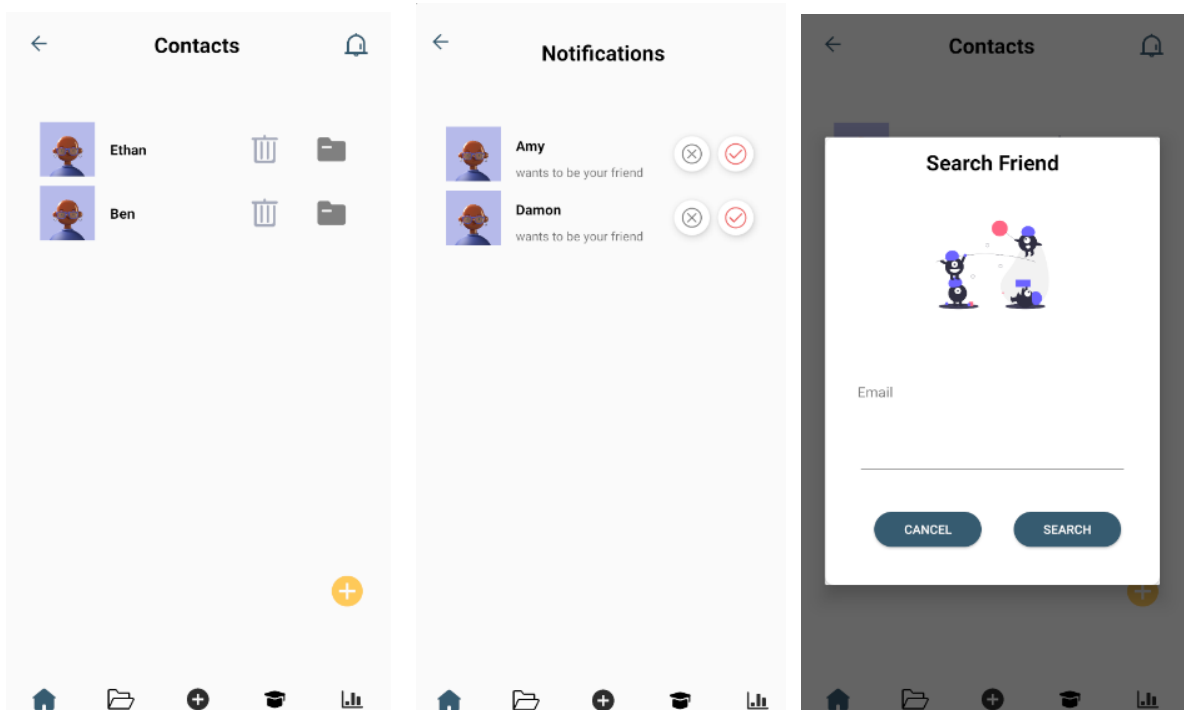


- As users may have different preferences for their profile picture, they can click the profile picture to enter the Edit Profile page to select their own profile picture. Users can also change or add their username, account password and phone number in the Edit Profile interface. We have also included various checks for these input fields to make sure the updated information is of the right format.



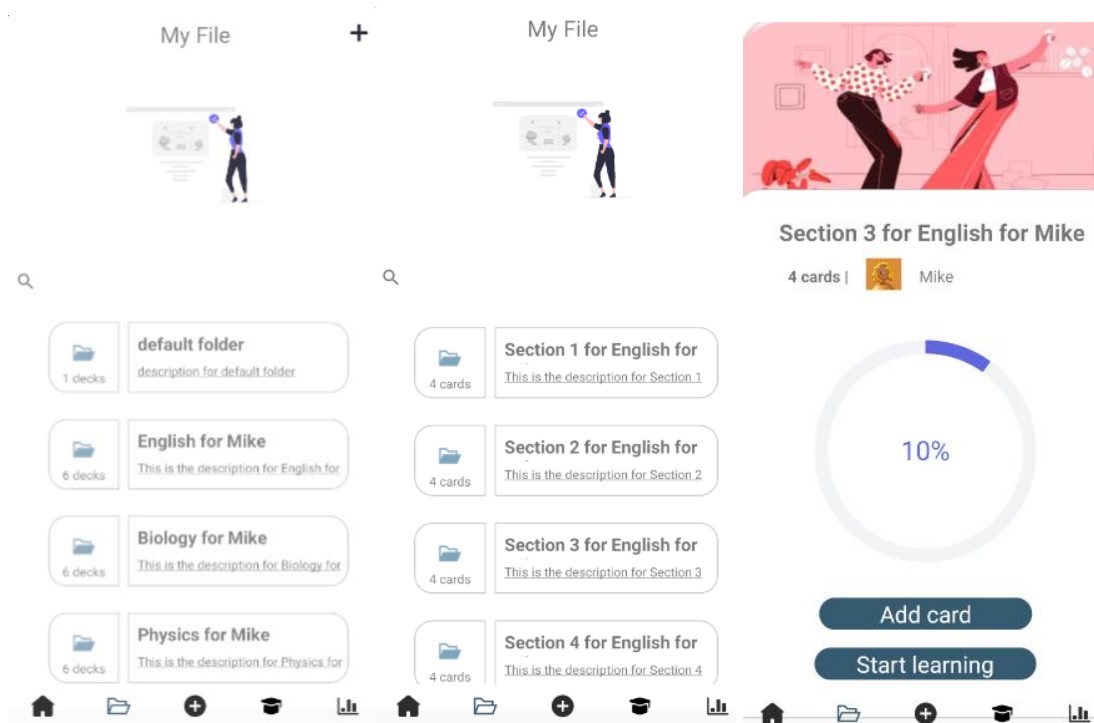
The image shows a mobile application interface for editing a user profile. At the top, there is a back arrow and the title "Edit Profile". Below the title is a square profile picture of a person with orange hair and glasses. The form contains four input fields: "Email" with the value "Mike@gmail.com", "Name" with the value "Mike", "Phone number" with a placeholder "Please input your phone", and "Change Password" with a masked input "*****". At the bottom of the form are two buttons: "CANCEL" and "SAVE". A navigation bar at the very bottom contains five icons: a house, a folder, a plus sign, a graduation cap, and a bar chart.

- Clicking the upper right image on the Home interface will take users into the Friends system interface, where users can see their friends/contacts list and enter their friends' public learning library by clicking on the folder button displayed next to the username. They can also delete a particular friend. Furthermore, users can add new friends and agree to other people's requests by clicking on the add button on the bottom right and the notification button on the top right respectively.



3.5 Folder

- The Folder interface is designed for users to browse their learning files. Users can swipe up and down to find the folder they want to select, or directly find the folder they need through the search function. Users can click the folder they want for entering the Deck list and select the specified Deck to know the current learning progress of this Deck. Click “Add Card” to add additional learning cards to the current deck or click “Start Learning” to enter Study Interface to learn the current deck. If the user wants to modify a Folder File or Deck File, the user can edit or delete the Folder File or Deck File by right-swiping to specify File.



3.6 Add

- The Add interface is designed to create a Deck of cards. The user can edit the title and description of the Deck file to describe the contents of the Deck.

There are multiple settings to be established before creating the new deck. For example, the user can set a schedule and period of time to determine the learning frequency and deadline of the Deck. Also, the user needs to specify whether to be reminded to learn the Deck file on time or not. Some other settings include cover picture, public option and folder browsing. After completing the above settings, the user is free to create a new Deck File.

Create Deck

Title

Description

Schedule ☒ daily ☐ weekly ☐ monthly

Mon Tue Wen Thu Fri Sat Sun

Period of time 0 days

Reminder ☒ Remind me ☐ No reminder

Choose a cover Picture

Browse options

Public or not ☒ Public ☐ Private

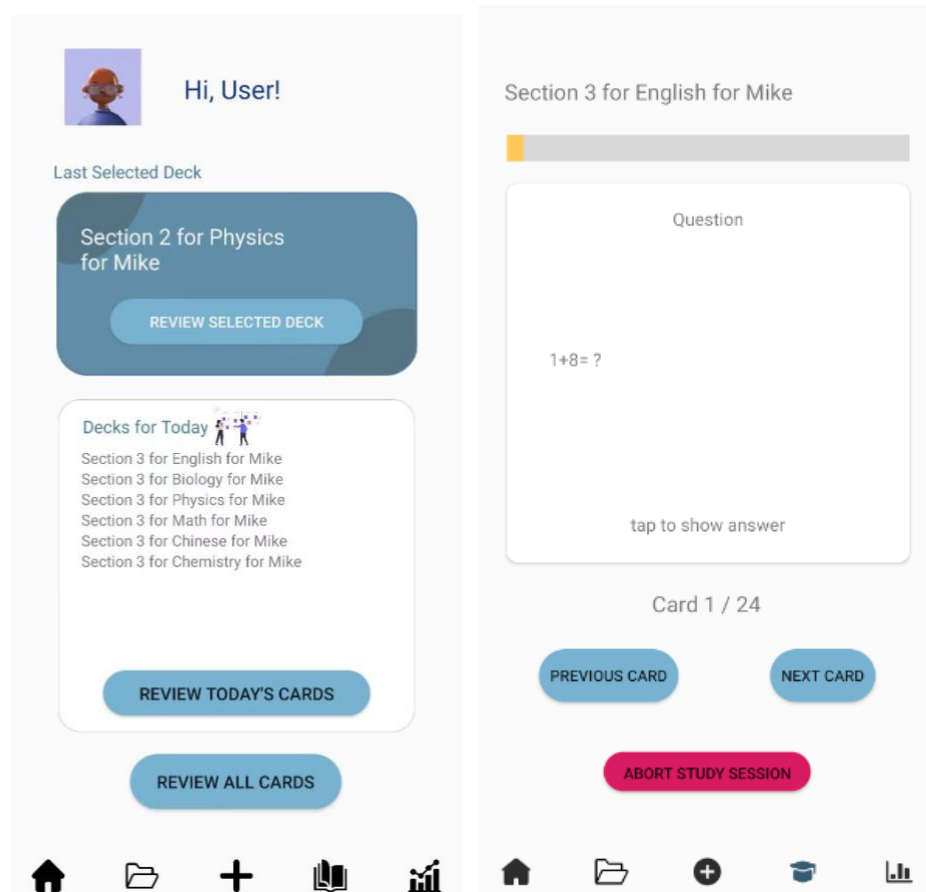
Select Folder

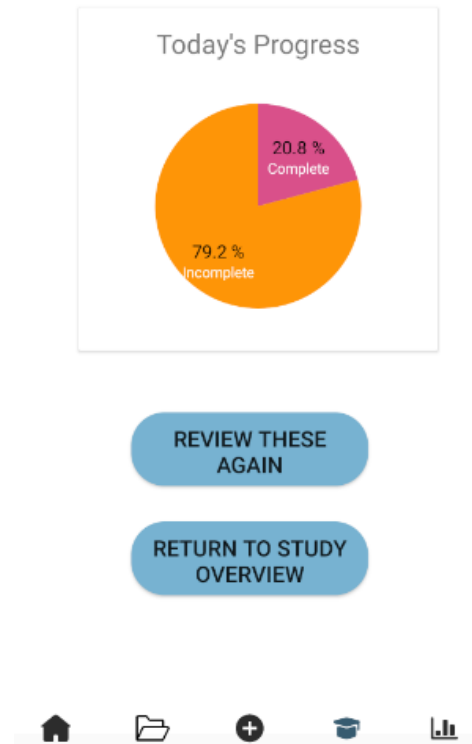
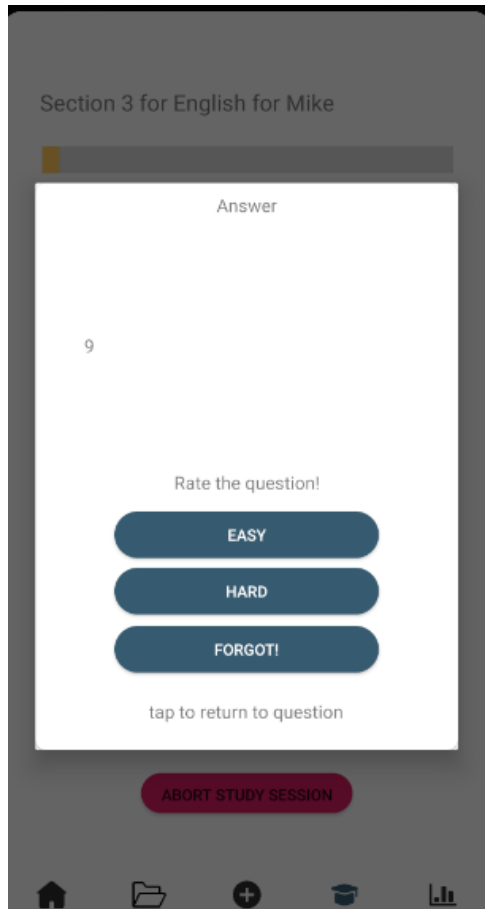
Create new deck

3.7 Study

- The Study Interface is designed to help users to Study and Review. For the users' convenience to continue the previous learning, the last Deck File that was recently selected is displayed above the Study Interface. The user can access the Deck File by clicking "Review Selected Deck". In addition, in order to facilitate users to review what they have learned today, all deck files that are scheduled to be learned today are displayed in the Study Interface in the form of a list.

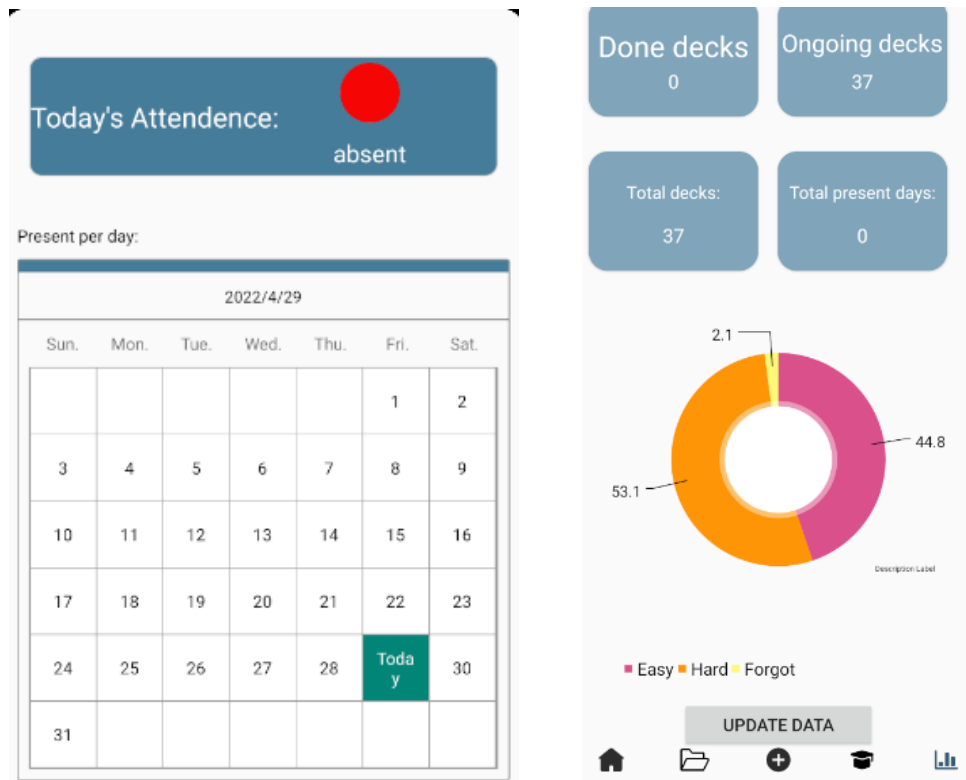
To effectively study, users should try to remember the answer to each question without tapping on the card which then reveals the true answer. When users finish a card question, we designed a function for users to rate the difficulty of remembering the answer for that question. Users can click "Review Today's Cards" to review all cards learned Today. At the bottom of the Study Interface, we also designed a "Review All Cards" button to help users review all the content they have learned so far.





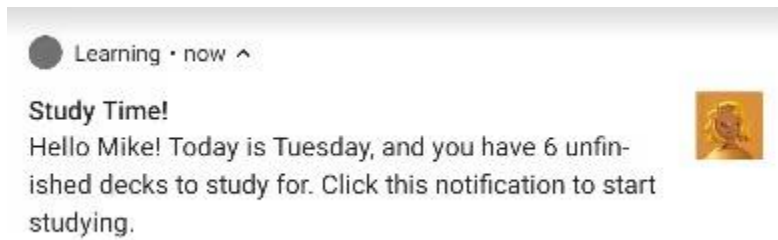
3.8 Statistics

- The Statistics interface is used for attendance and learning summary functions. The user can see his/her attendance status of today at the top of the interface, and the daily attendance result of the user below the status bar. When the user clicks to take attendance, the status will change to present, and the corresponding change will be recorded in the calendar. In order to let users have an intuitive understanding of their learning achievements and progress, we set up four statistical boxes that show today's completed decks, total ongoing decks, total number of decks, and total number of days the user has signed in. At the same time, in order to let users know where their weakness of knowledge is, we will ask them to rate the difficulty of Decks after each Deck learning is finished, and show the difficulty ratio of the Decks at the bottom of this interface. To view the most updated difficulty ratio, the user can click on the "Update Data" button at the very bottom to refresh.



3.9 Reminder Function

- In order to help users better complete the assigned learning tasks, the reminder function of our app will remind users of today's learning tasks at 12 AM every day to avoid users forgetting them. The user can then tap on the notification from the notification bar on their Android phone to open the app. To study today's reminded cards only, the user can go to the "Study" tab and click on the "Review Today's Cards" button.



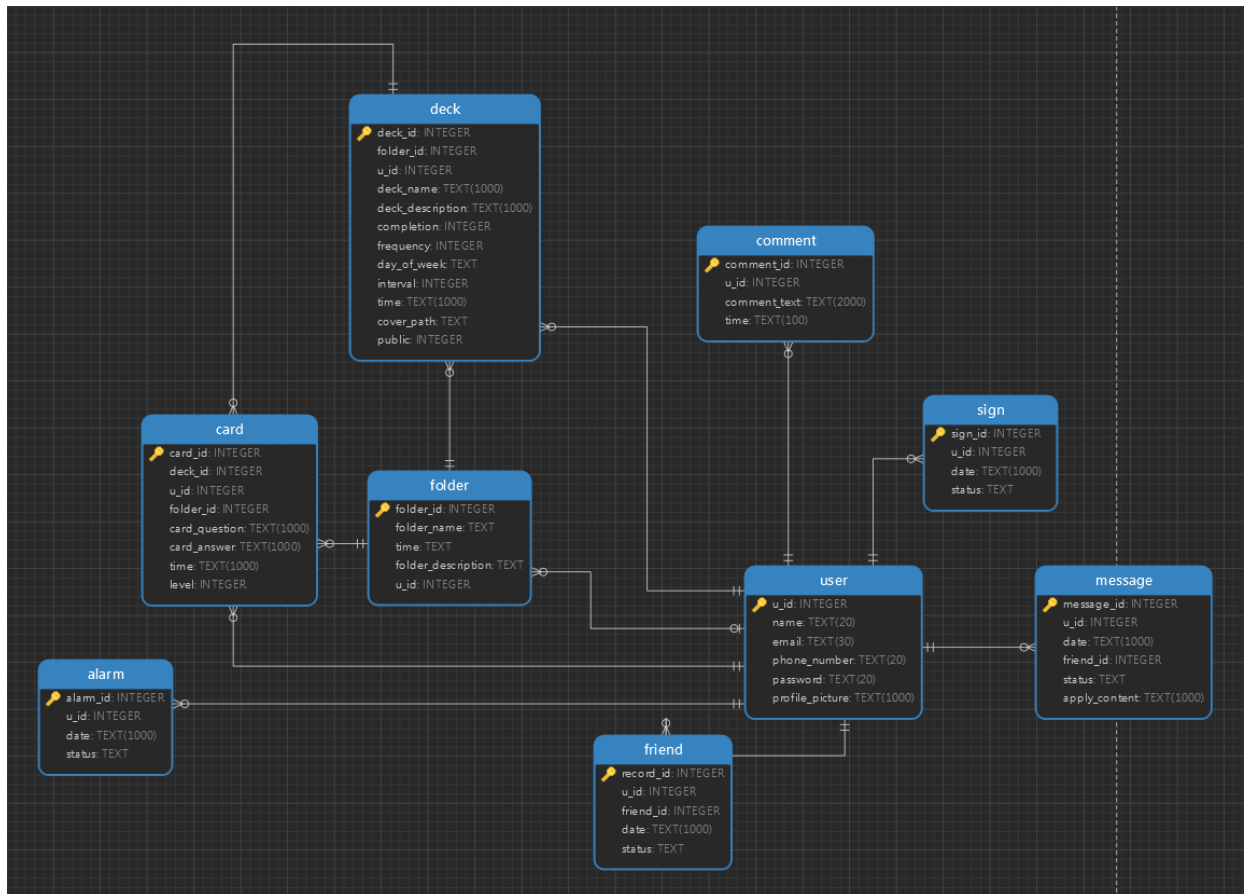
3.10 Possible improvements

- The Friends feature could be made more interactive by adding the ability for friends to remind each other to clock in, chat online and add comments to shared cards. If possible, a friend group feature may be added that enables shared learning to exist not only between friends, but also among a group of users with a common goal.
- In terms of the folder system, users may further select from friends' public sessions the decks they are interested in, instead of directly displaying all the public Decks of Friends. And we can set up a default friend to each user, like a Study assistant, which is a medium that can help new users who do not yet have many friends to quickly participate in shared learning. The Study Assistant contains public decks created by different users, while users can choose whether or not they want the Study Assistant to include the decks when they created them.
- Our reminder function is now uniformly set to remind at 12 am, as when creating a new deck users can only set to remind or not for the time being, not the time of day. An improved version of this reminder functionality can be that the user is able to set the exact time he/she wishes for the app reminder to be sent.
- Also, our app only has one mode of learning - the flip card mode, so users cannot choose other ways to study such as fill-in-the-blank or matching mode.

PART IV. BACKEND APP DESIGN & TOOLS

4.1 Database Connection

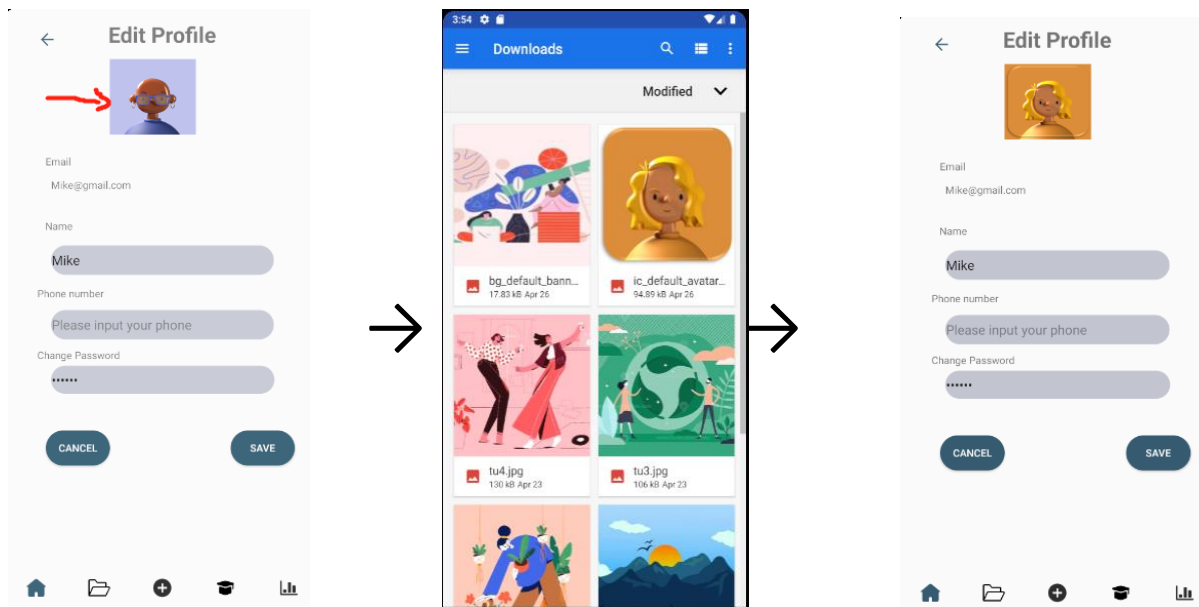
Our app is connected to a SQLite local database so that user information, study materials, and various other statistics can be stored and retrieved dynamically by the app user. In particular, we created the following tables and relationships for the SQLite database:



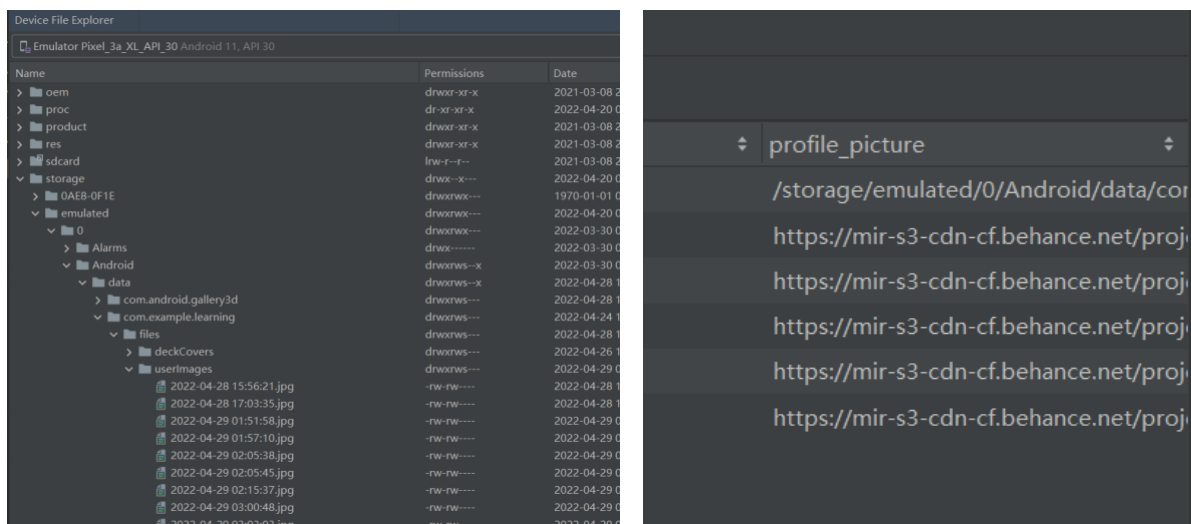
To insert, update, or query data from the database, in our project we created DbApi, a Java class that acts as the API between the SQLite database and our Java code.

4.2 Mechanisms for Profile Picture Update

Each user can change his/her user image in the profile page. The user can click the “user image” button, then the app will turn to the local album to select pictures. After selecting a picture ,the user image will change to the new one.



After modifying the user picture, the new image will be stored in “storage/emulated/0/Android/data/com.example.learning/files/userImages/”. The address of the image will be stored in the database “user” with column “profile_picture”.



4.3 Original Design Files

The following are original design files for the UI. The final app has applied several changes.

