OREGON STATE UNIVERSITY, COMPUTER SCIENCE

CS 361 Software Engineering I
HW 2: Evaluating Requirements

STUDY HABIT PHONE APPLICATION

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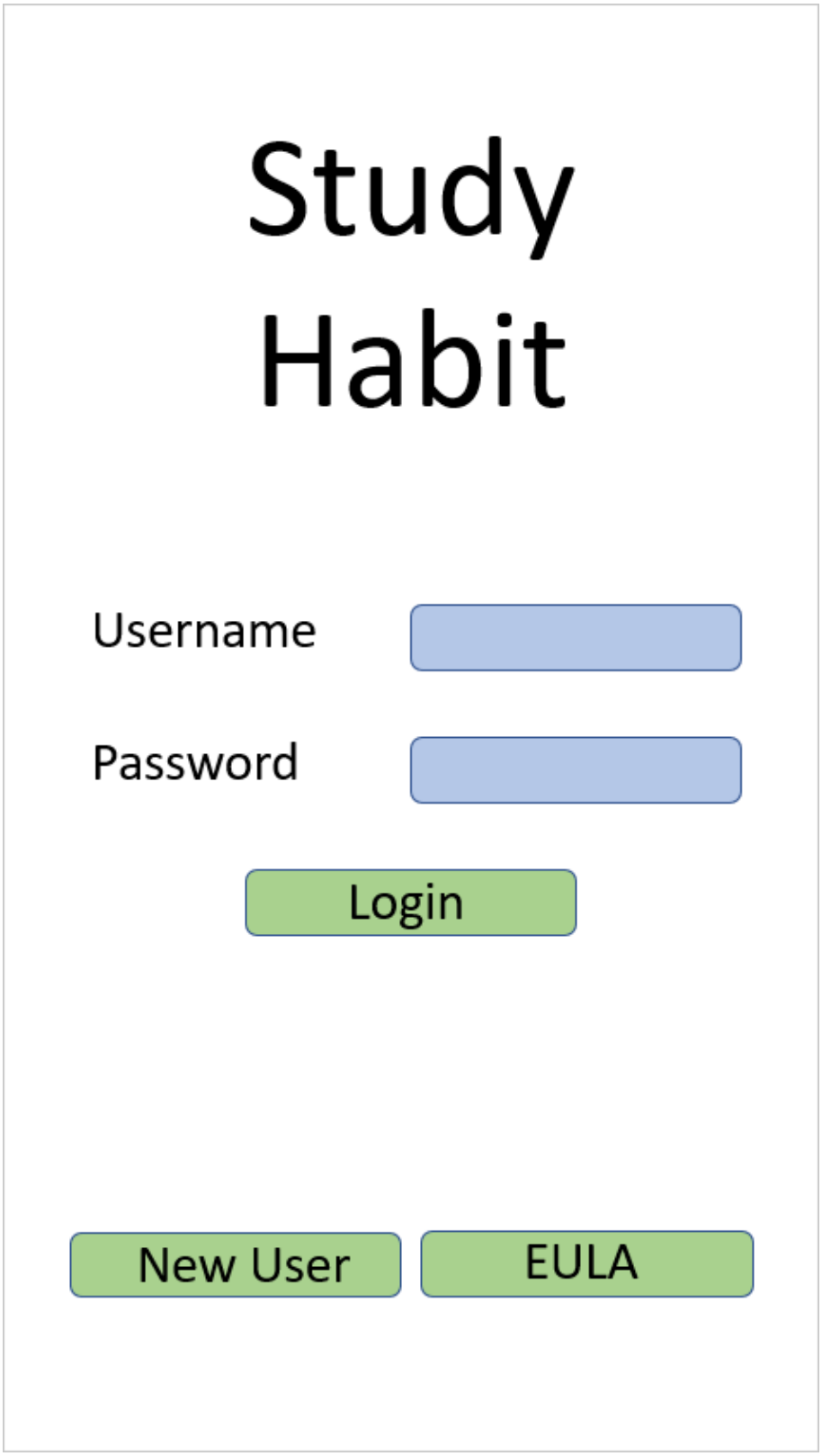
PROPOSAL PARAPHRASE FROM CUSTOMER

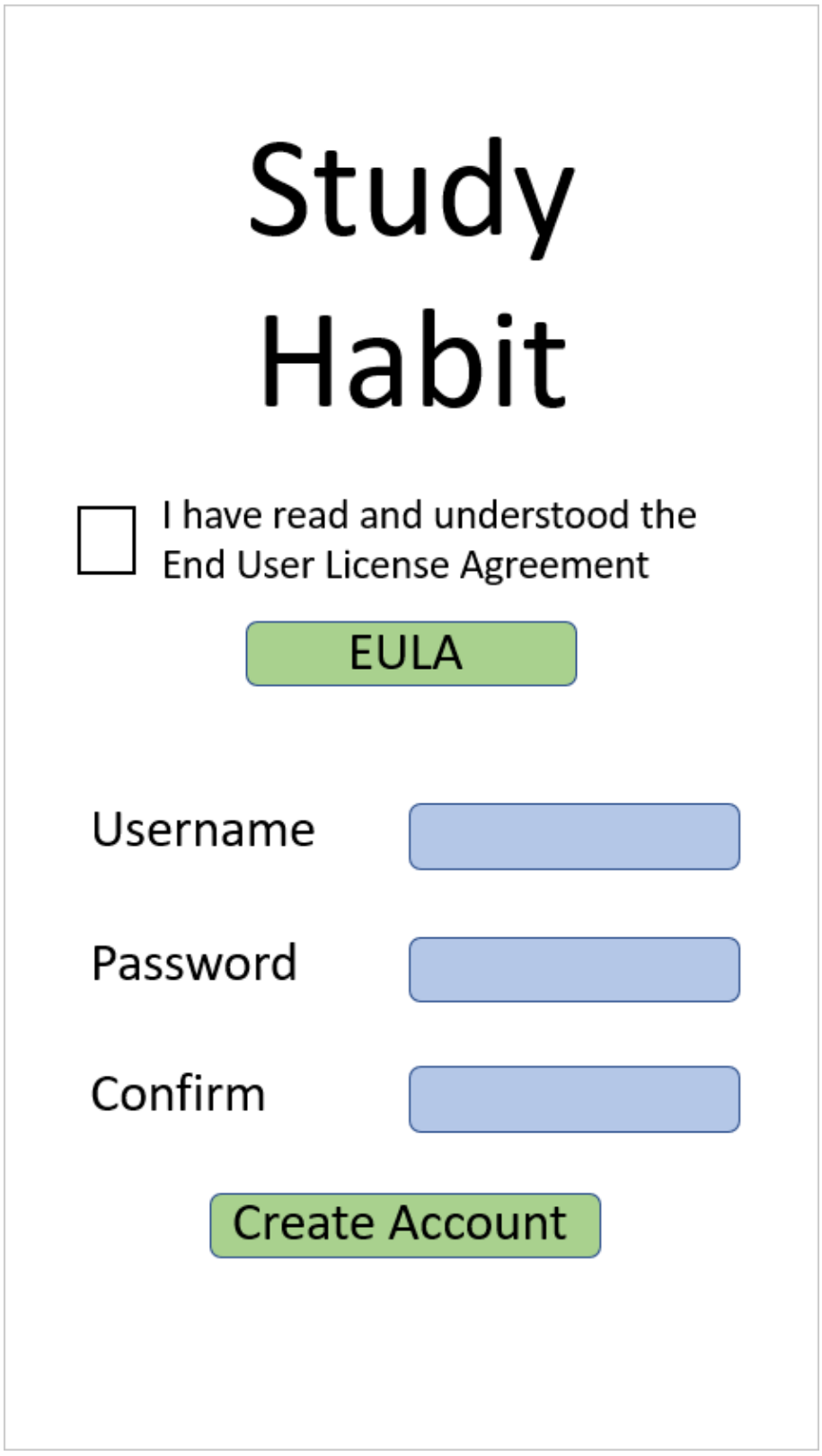
The intention of this application is to aid students with their study habits. Students will enter their class information, and establish goals for each class. The goals include time allocation and desired grade. The application will make recommendations to adjust the time allocation based on the students current grade, remind the student when it is time to study, set a timer for the student during a study session which count down the time until a break and disable notifications from other applications during a study session.

There is also a store of study tips to aid the student in developing good study habits. Other tools will exist to help students prepare for tests, such as the ability to create flash cards, review materials, and organize notes either imported from Google Drive, or scanning in handwritten notes.

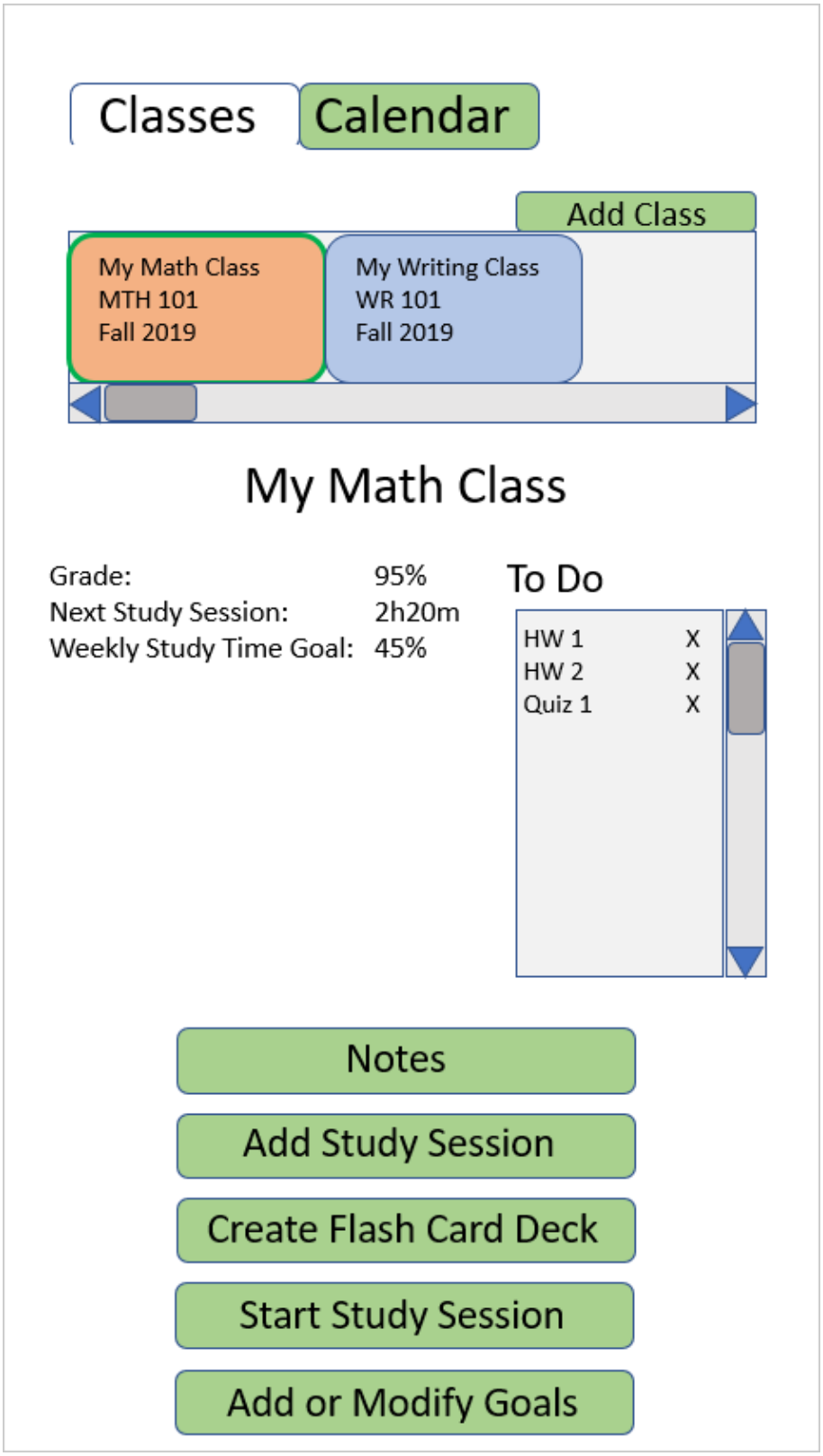
The application will integrate with common learning management systems (LMS) such as Canvas in order to remind students about due dates, and make recommendations based on performance. Recommendations will be tailored to the students' specific needs, such as test taking recommendations if the student is doing well on assignments, but not on exams.



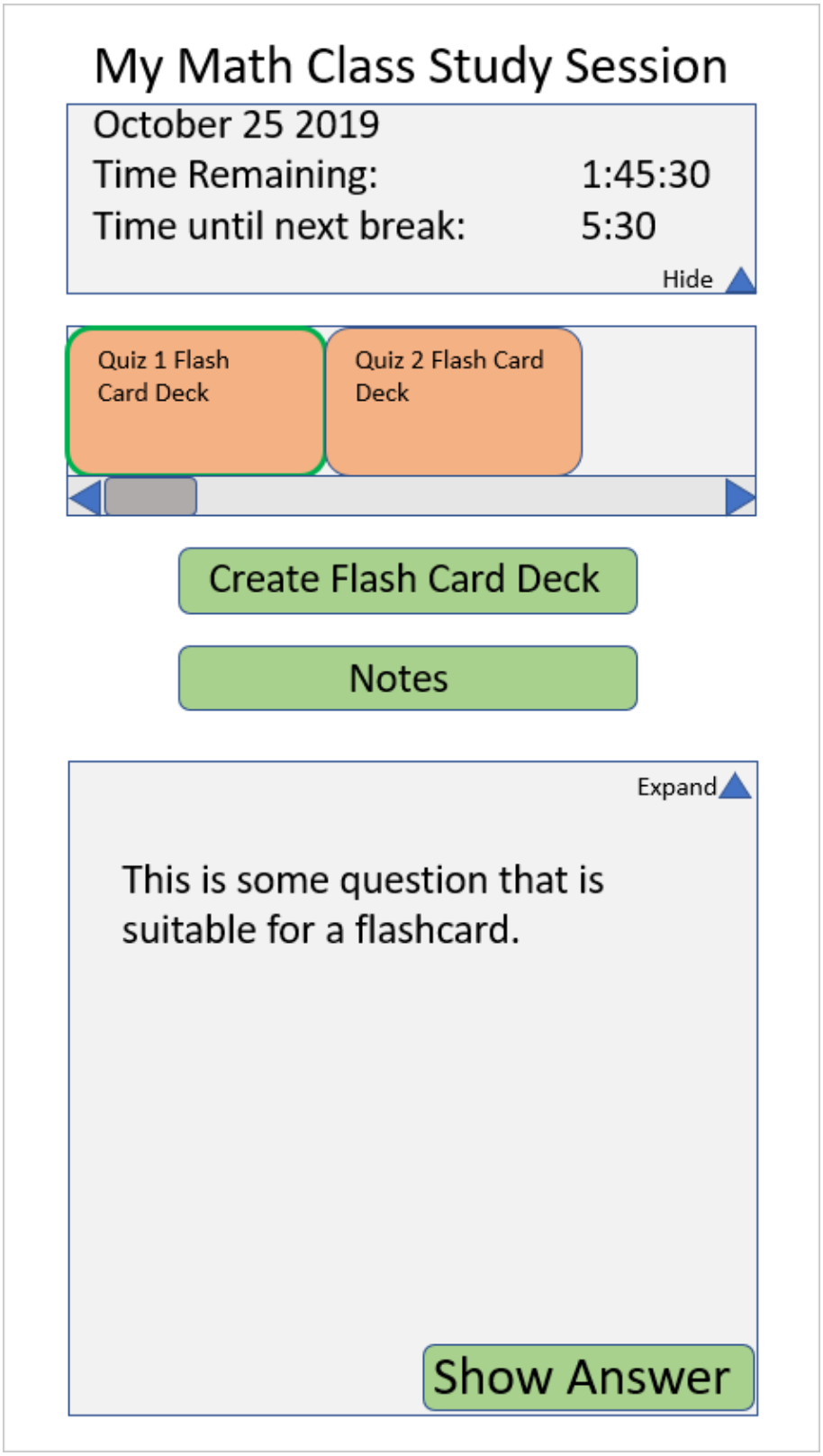
This is a paper prototype of the login screen used in the “Create Profial” and “General Use” use case.



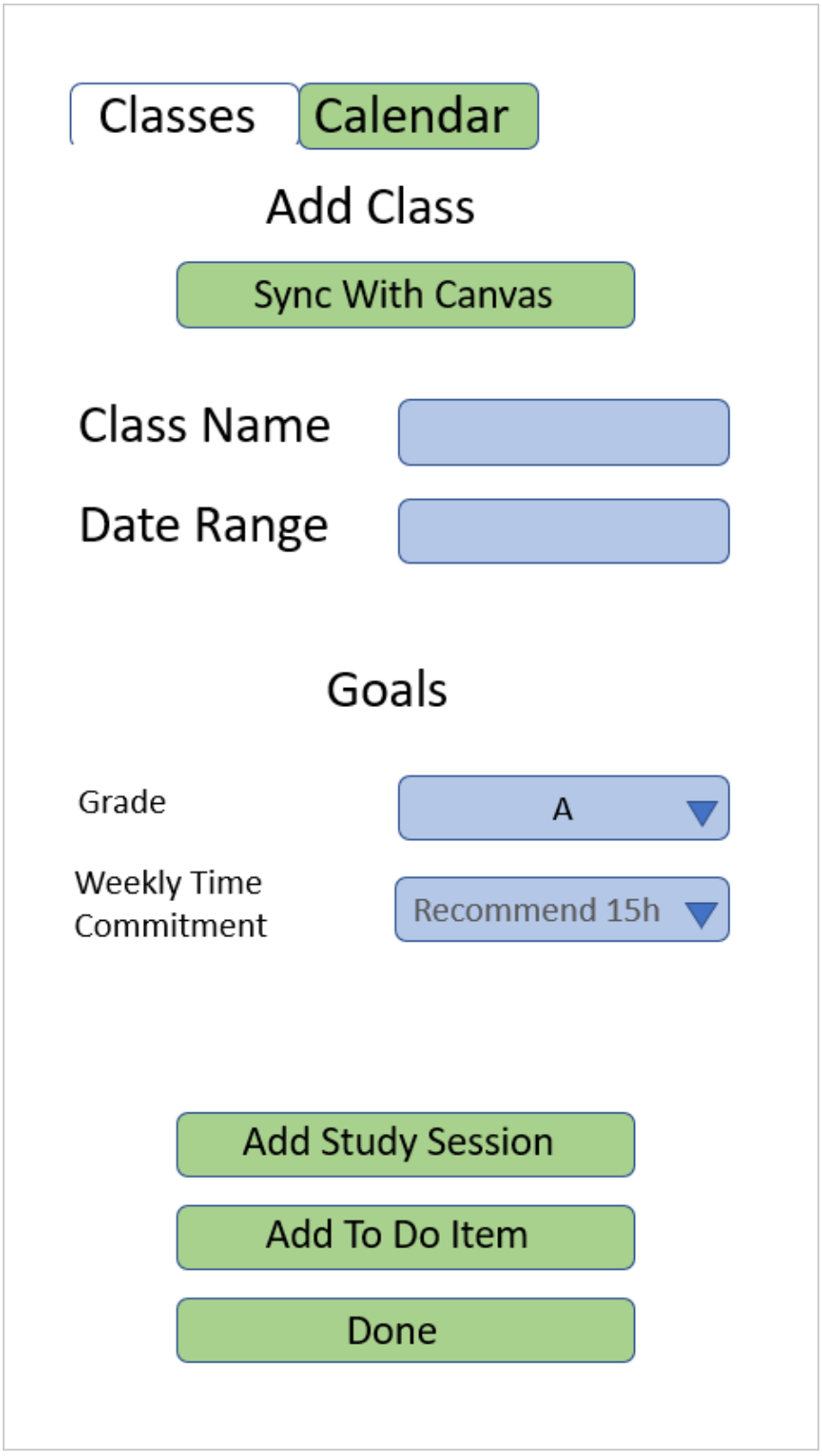
This is a paper prototype of the new user screen used in the “Create Profial” and “General Use” use case.



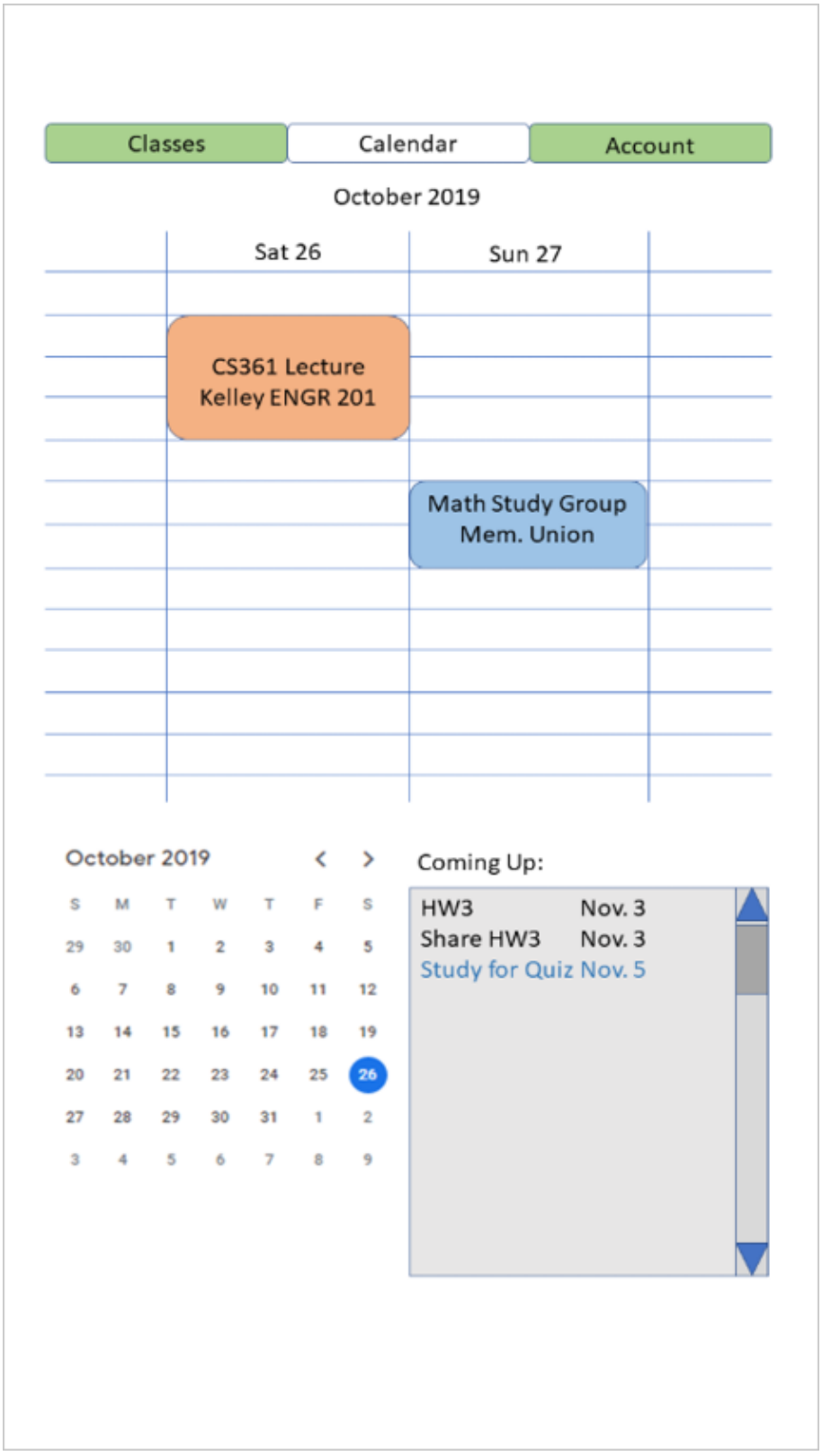
This is a paper prototype of the Classes screen used in the “Flashcard” and “Study Session” use cases.



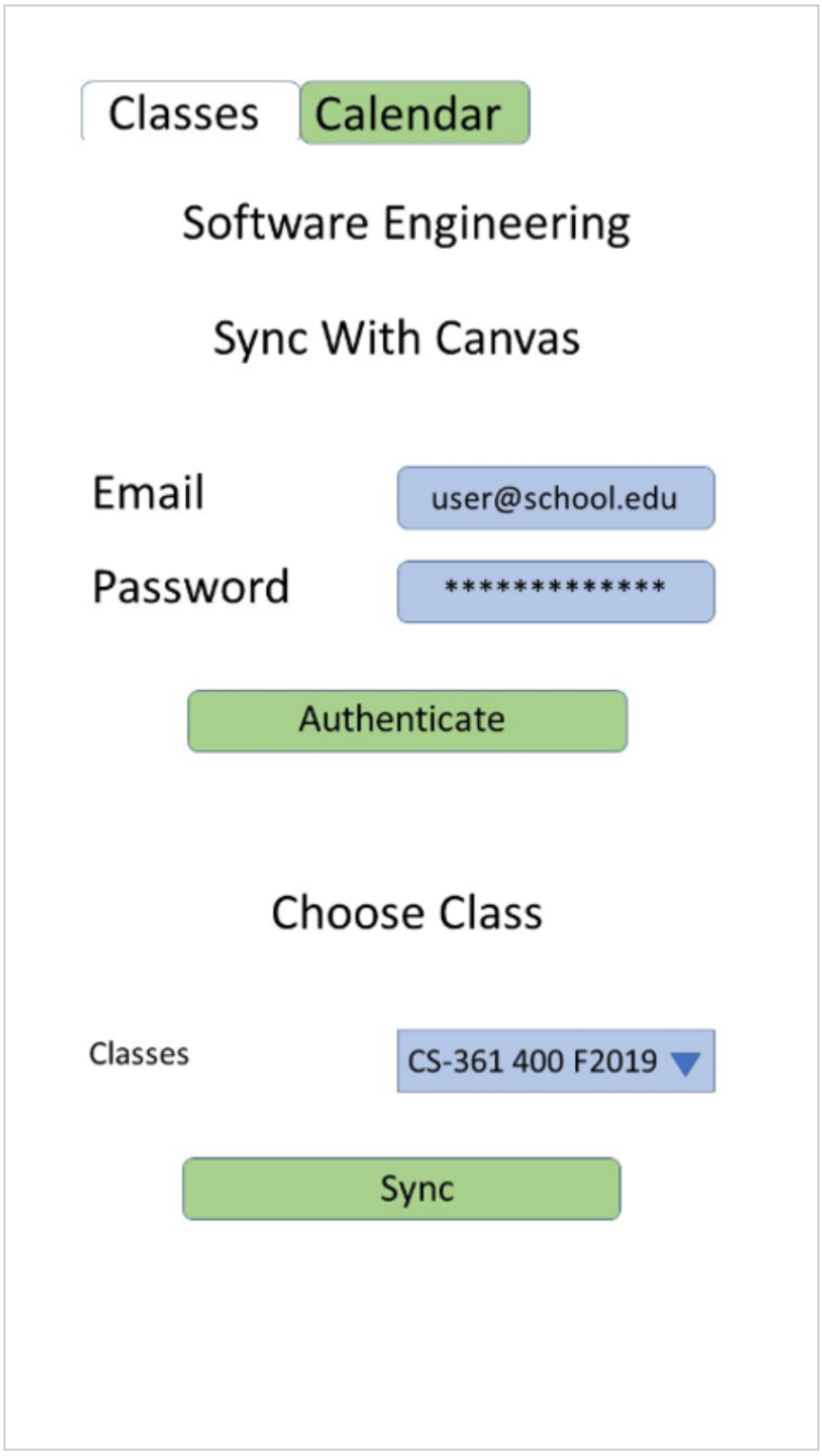
This is a paper prototype of the Study Session used in the “Flashcard” and “Study Session” use cases.



This is a paper prototype of the Add Class screen used in the “General Use” use cases.



This is a paper prototype of the Calandar screen used in the “General Use” use cases.



This is a paper prototype of the Canvas Sync screen used in the “General Use” use cases.

REVISED REQUIREMENTS DEFINITION

Functional Requirements

1. The user enters class information for each class. The user can select their classes from a variety of options offered in the application. This will be a part of setting up a user profile.
2. The user provides goals for each class which include:
   a) Time to spend on the class.
   b) Desired grade.

   The user will be able to select weekly hour time commitments and desired grade for each class individually. After making their choice they will be able to schedule their study sessions on their calendar.
3. The application will recommend adjustments to time allocation in order to fit the desired grade (Question for customer: how would this work, one size fits all, or more complicated). Should the times allocated not meet the expected time commitments associated with their desired grade, the application will show a message stating the time amount is likely not sufficient.
4. The application will give the user reminders to study.
   Notifications for scheduled study sessions will be pushed 15 minutes prior.
5. The application will have a timer when studying and there will be notifications for breaks. Notifications for breaks will be delivered according to some schedule of work and break (i.e. the Pomodoro Technique of 25 minutes working with 5 minute breaks and a longer 30 min breaks every five cycles.)
6. The application will disable other notifications while studying.
7. Study tips will be provided to the user. There will be a repository of basic study tips such as how to take detailed notes, and improve organization and focus.
8. There will be a flash card tool. The application will generate sets of flashcards with user supplied definitions and questions.
9. Allow the user to setup review material to use during study sessions.
10. There will be the ability to import notes from Google Drive into the Notes section for the class. The application will take files from Google Drive and store them with offline accessibility.
11. The user can scan handwritten notes and add them to the review materials for studying. Scanning software will make a text file from a picture of the user's handwritten notes.
12. There will be contextual recommendations. E.g., if the user does well on assignments, but not on exams, the application will recommend tips to do better on exams.

New Functional Requirements from Simulated Customer

13. User is given study tips specific for they're deficiencies in a subject by the app.
14. Peers in classes can collaborate on notes and flashcards and access a database of all flash cards made on the app.
15. User is able to set a timer for his study session and is given recommended break times through the app based on the length of their session.
16. The user will generate a profile that includes a username, password, and classes that they are in.
17. The user will be able to add classes both during profile creation and during regular use of the application.
18. The user will have a calendar that includes scheduled study sessions and upcoming deadlines for each class such as homework assignments, tests, and quizzes.

19. The user will be able to sync each class with their canvas profile, which adds information to their calendar and updates current grade performance.
20. The user will be able to create flashcards for self-testing.
21. The user will be able to scan their handwritten notes and save a copy of them in the app for use during study sessions or for quick look up.
22. The app will include a repository of study tips that will be recommended to user's during study sessions based on their goals and grades.
23. The time that the user spends studying within the app will be recorded and used to track progress.

Non-Functional Requirements

1. The application is available for Android and iOS.
2. Parts of the application, such as the study timer, review materials, and flashcards, need to function when offline.
3. The time spent doing study activities must be tracked and put towards the weekly time allocation goal.
4. The application is ADA compliant.
5. Logging on will take no more than 20 seconds.

New Non-Functional Requirements from Simulated Customer

6. Updates will automatically be downloaded and installed.
7. It will take no more than 20 seconds to authenticate the user while logging in.

USE CASES

1. Use case name: Math Flashcards
   Actor: Math Class Student (user)
   Preconditions:
   - User is a student in a Mathematics Course.
   - User has a test about a specific subject that they wish to study for.
   - User has downloaded and has access to the Study Habits App.
   - User has registered their class information in the Study Habits App and has the appropriate class materials to make flashcards to study with.

   Postconditions:
   - The app has generated a set of flashcards based on the input information.
   - The user can now access the created flashcards at any time to study the subject.
   - When using the flashcards, the app will keep a timer to remind the User to take breaks as well as periodically offer study tips.

   Flow of events:
   - Authorization: The user logs into their account.
   - Selection: The user chooses which class they want to study for. If connected to the internet, the system connects to Canvas to access the necessary information for the class
   - Creation: The app imports available information for that class, and the user can input information to create a flashcard set for studying.
   - Study: The user loads the flashcard module and starts a study session.

- Monitor: The app begins to time the user's study session, waiting for recommended breakpoints to alert the user.
- Recommend: The app makes recommendations while the user studies their flashcard set on how to implement better study habits.
- Termination: The user completes their study session, and closes the application.

2. Use case name: Creating profile and general use
   Actor: Student (user)
   Preconditions:

   - The user is a student in one or more courses.
   - The user has downloaded and has access to the Study Habits App.

   Postconditions:

   - The user has a profile on the app that they can log into at any time.
   - The user's profile contains their classes, login information, flash cards, notes, and a schedule with study times.
   - The app will create notifications for approaching study times.
   - The app will interact with Canvas and obtain data (like type of classes) to select tips for the user.

   Flow of events:

   - Authorization: The user creates an account inputting a password and username. Later the user is able to log into their preexisting account.
   - Selection: The user chooses which classes they are taking and allocates study times and grade for each class.
   - Creation: The app imports available information for that class for it's study tips functionality.
   - Study Plan: The user inputs their study schedule into a calendar.
   - Study: The user logs in to start a study session.
   - Monitor: The app begins to time the user's study session, waiting for recommended breakpoints to alert the user.
   - Recommend: The App makes recommendations while the user studies on how to implement better study habits.
   - Termination: The User completes their study session, and closes the application.

3. Use case name: Study Session Actor: Student (user) Preconditions:

   - The user is a student in one or more courses.
   - The user has downloaded and has access to the Study Habits App.
   - The user has already made a profile and study plan.

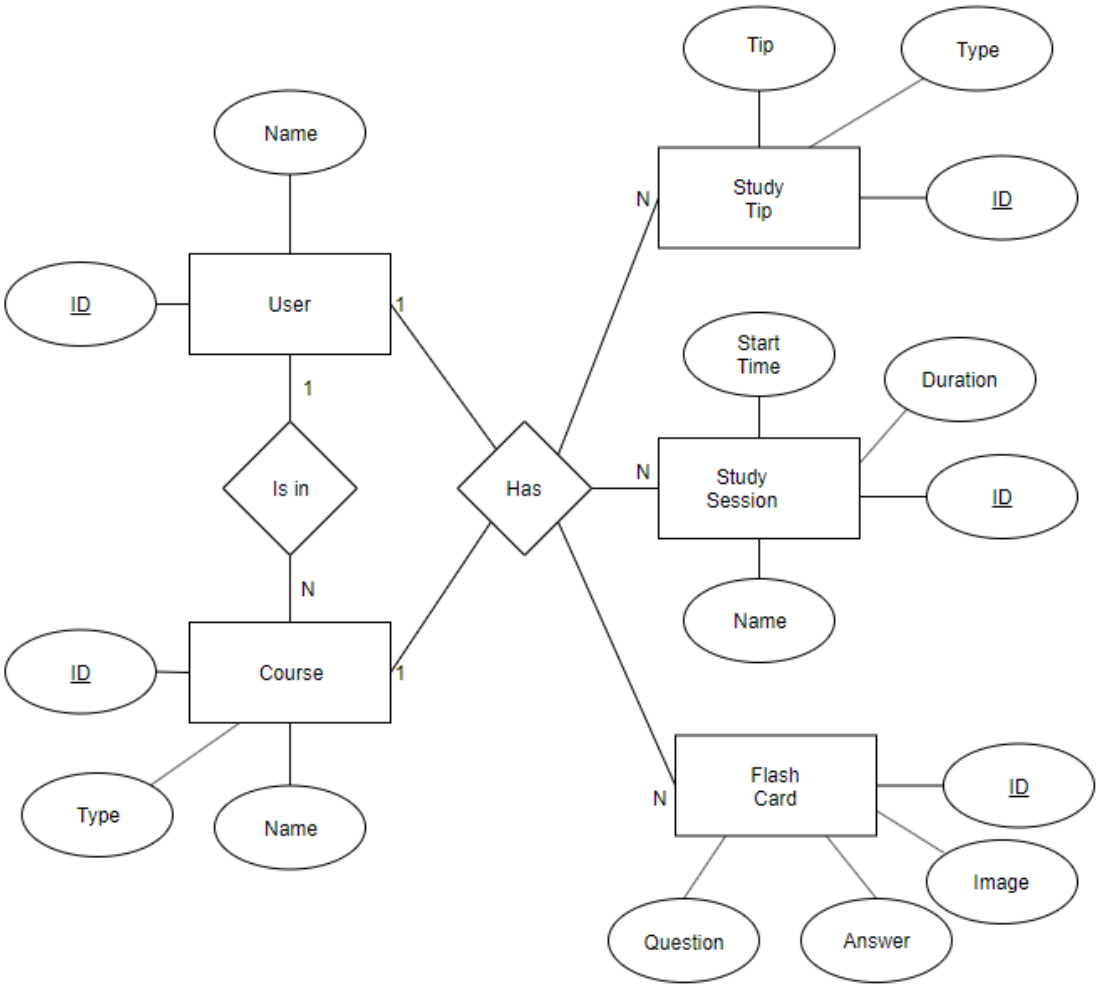
   Postconditions:

   - The study session will be logged as complete or incomplete

   Flow of events:

   - Authorization: The user is able to log into their preexisting account.
   - Enter Study Mode: The user begins a study session and a timer starts counting down.
   - Study: The user logs in to start a study session.
   - Monitor: The App begins to time the user's study session, waiting for recommended breakpoints to alert the user.
   - Recommend: The app makes recommendations on how to implement better study habits while the user studies.
   - Termination: The user completes their study session and closes the application.

Database Entity Relationship Diagram



This is the Entity Relationship Diagram for the database.

REVISED REQUIREMENTS SPECIFICATION

Functional Requirements

1. System compares user's desired grade and weekly time allotments and reports if the time allotment is likely not sufficient.
2. System creates calendar and receives inputs on study appointments in user's profile. System displays calendar for user with study sessions.
3. System detects, creates and pushes notification to host upon the arrival of the study appointment.
4. System blocks host notifications during the study period.
5. System will have access to a store of study tips with correlations for specific uses. (i.e., type of class the user is studying for, or other related activities).
6. System will receive user input to generate a store of flash cards that the user can later view and self quiz.
7. System will interact with Google Docs via an API to receive notes.
8. System will extract strings from image files or use an API to decipher handwritten text.
9. System will deliver advisory notifications based on grade or study attendance data.

New Functional Requirement Specifications from Simulated Customer

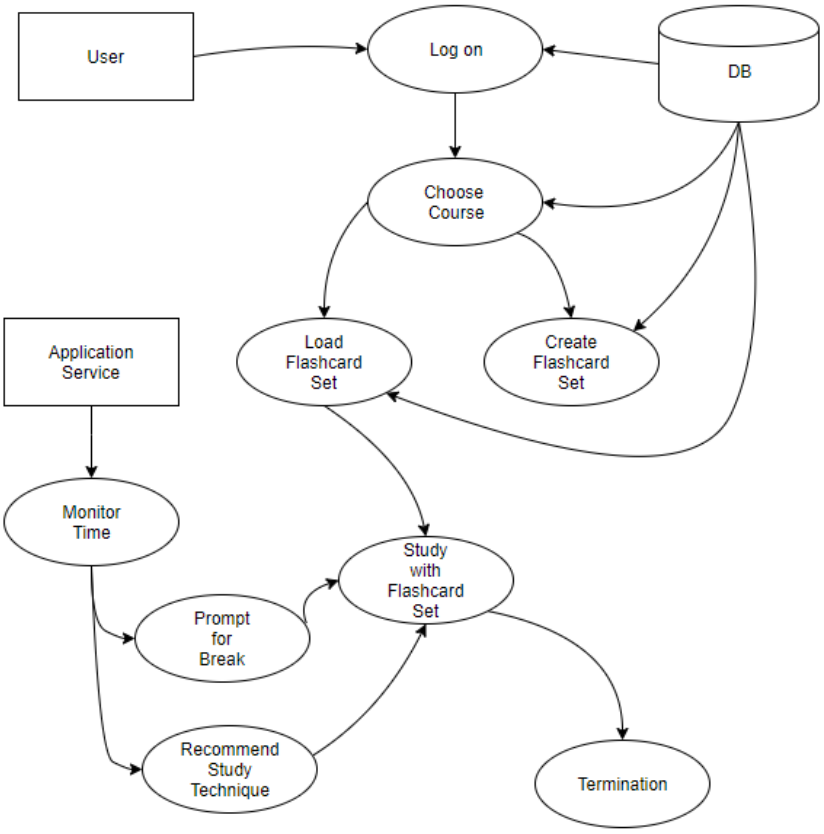
10. The system constantly monitors how the user is scoring in different areas of a subject. After determining where the user's could improve the system provides study plans and tips specific to those areas. The app will match a tip database with the user's grades and study habits to identify the action needed to improve.
11. The system allows peers to access each others flashcard sets and make edits on shared sets together. The system will only give access if user grants permission to another user to share their materials. The user will be able to access a large database of flashcards and download them to their phone.
12. The system allows user to input time limit of their expected study session and displays on screen. The system then uses input time and current time on timer to recommend break points based on the session.
13. Upon creation of a new profile, the system generates new profile for users and stores all profile information, including classes, for each student in a database.
14. The system will store all information for each course such as name, desired grade, weekly time allotment, etc. in a database each time a class is added to a users profile. This will occur both during profile creation and during regular use of the application.
15. The system will store calendar events for each class including study sessions, assignments, tests, and quizzes. The system will display these for the user when calendar page is accessed.
16. The system will be able to access Canvas through information provided by the user. This information will be used to add events to the calendar or update any grade information that is stored for each user.
17. The system will store sets of user-created flashcards that can be used during study sessions to prepare for upcoming quizzes and tests. Flashcard sets can either be made manually through the user inputting questions and answers into the blank cards or by downloading them from their peers.
18. The system will include a scanning feature that utilizes the device's camera to scan in handwritten notes. Once scanned, the user will be able to edit images with basic functions such as altering brightness for visibility or cropping the scans to keep them clean. Afterward the scans will be saved to the User's account and can be used during study sessions at any time.

19. The system will include a database of study tips and recommendations that will be displayed to the user at specific intervals. These tips can be tailored to specific subjects and will aim to be relevant to areas the User is struggling in based on their goals and grades.

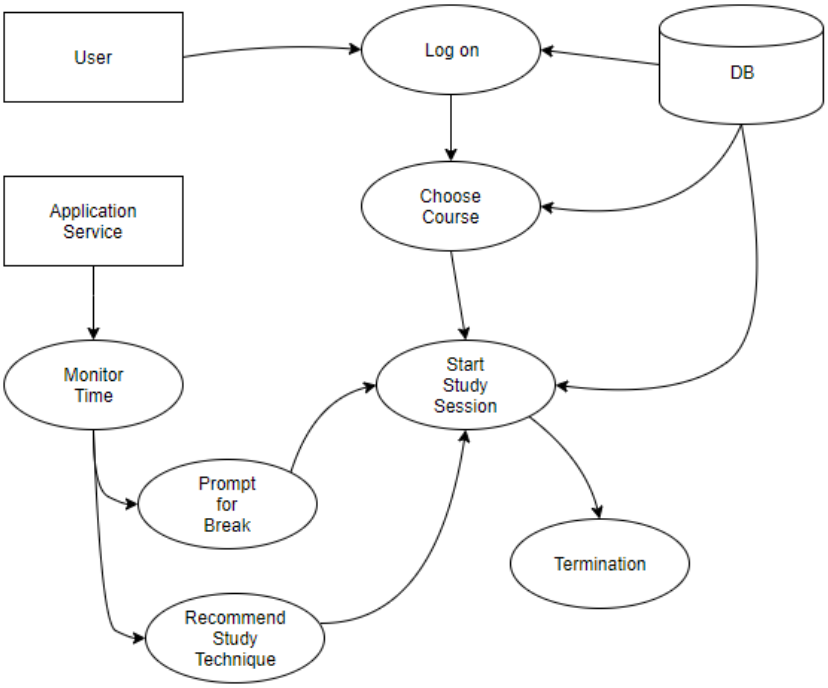
Non-Functional Requirements

1. System is supported on Android and IOS.
2. System functions when offline.
3. System keeps track of the time that the user spends doing study activities.
4. System has screen reading functionality.
5. System communicates with database in the background.
6. The system will communicate with Canvas to fetch calendar information and notifications from the user's courses during the term.
7. System authenticates users within 20 seconds.

Dataflow Diagrams for Important Use Cases

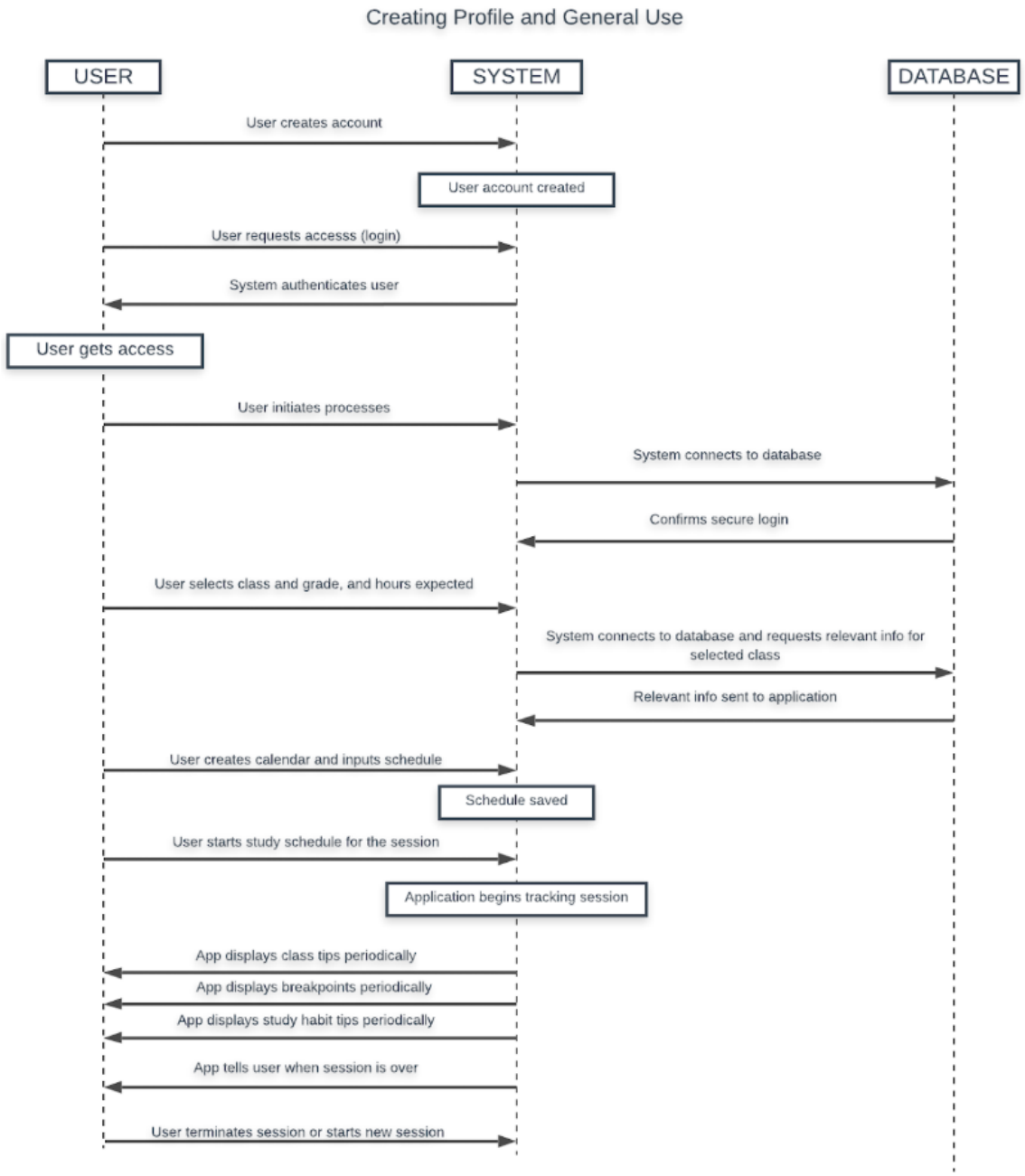


This is a dataflow diagram for the flashcard use case.

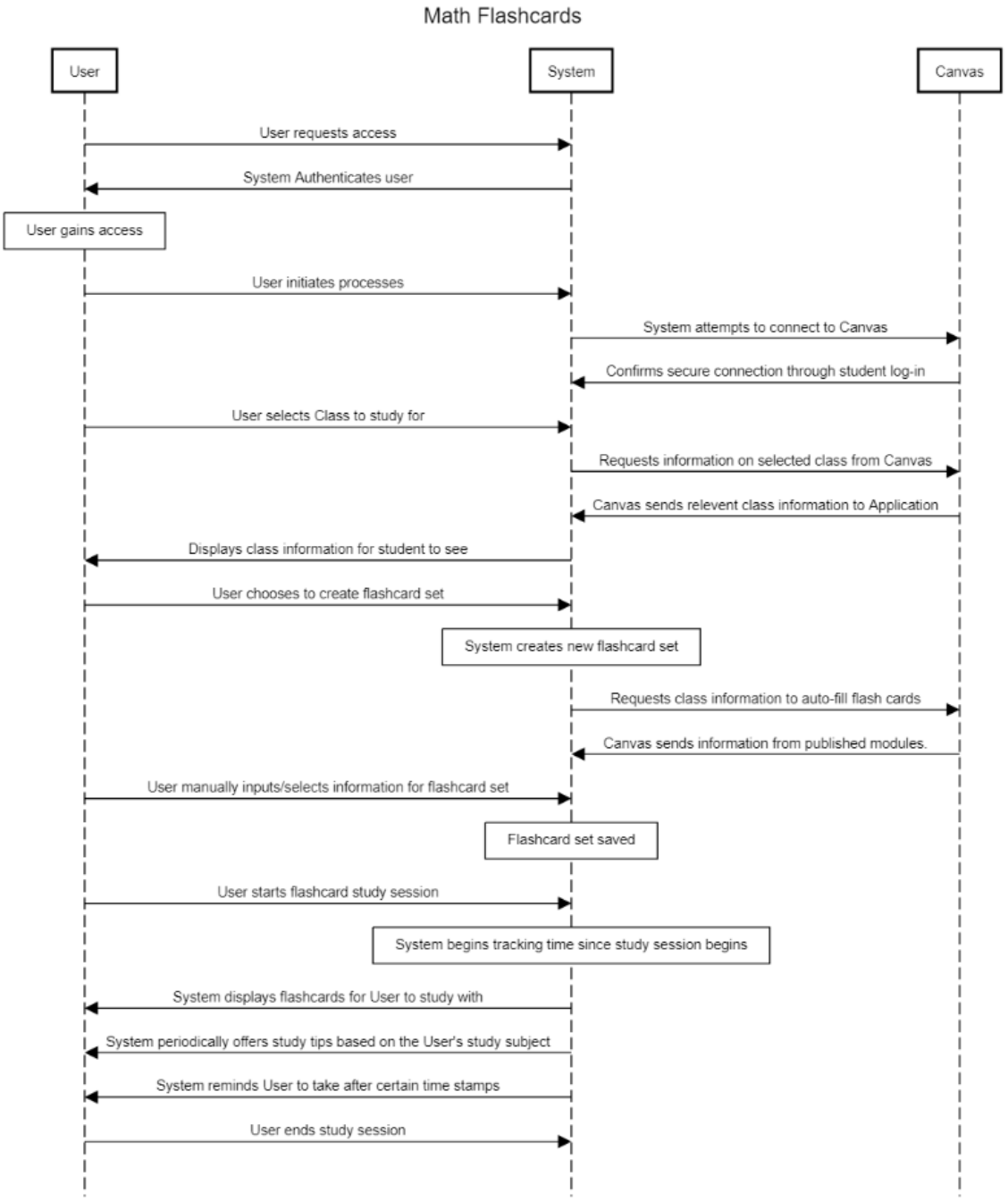


This is a dataflow diagram for the study session use case.

MESSAGE SEQUENCE CHARTS FOR IMPORTANT USE CASES



This is a message sequence chart for the new user and general use case.



This is a message sequence chart for the flashcard use case.

This is a message sequence chart for the study session use case.

SUMMARY OF CHANGES

By incorporating the personalized study tip feature the app will actively focus on what the user needs to improve specific aspects of their scholarly routine. This will give the app the ability to dynamically support a wide variety of study improvements and will avoid spamming of useless tips which only distract the user. This aspect of the system could dramatically improve the overall effectiveness of the app. By adding personalization the app will adapt to each user and give accurate reports on their study methodologies.

The general user experience will be improved with the ability to collaborate with classmates and access past work done by others. With the ability to access and download from a large database of flashcards the user will be able to draw upon years of work from other students. The user will be far more likely to benefit from flashcard studying if they themselves never do the work of creating the cards.

Allowing the user to enter the length of their study session and displaying recommended break times will help optimize the user's studying by decreasing distractions and burnout. Profile creation is split into a separate requirement since courses can be added at any time, not just during the creation of a profile. All user information needs to be stored in a database upon profile completion.

Course creation requires the same process for both the user and the system regardless of whether it occurs during profile creation or regular use of the application. Course name, desired grade, weekly time allotment, etc. are stored by the system a database each time a class is added to a users profile. Two new requirements were added to reflect this and requirement one and specification one are now redundant and will be removed in future documents.

A calendar showing all upcoming events is an incredibly useful tool when planning out the week. The events being stored in a database allows for the events to be displayed both in a calendar that shows all upcoming events and a to-do list for each class. The calendar was only indirectly mentioned in the requirement definitions for the HW1 submission, while being directly mentioned in the specifications.

The ability to sync the calendar and grade information with Canvas allows the user to have most, if not all required information needed to manage time and study in one app. The user will not need to go between different apps and websites when planning out future study sessions. The new calendar requirement definition replaced definition 12 and specification 10 on HW1.

Everytime the user logs into the app it will check and see if it is up-to-date. If an update is available it will prompt the user to go to their respective app store to update the software.

When a user attempts to login to the app, the app will query the user database and will return a response within 20 seconds time.

When the user initiates a study session the app will keep track of the time spent studying in the background in order to make reminders and offer tips to the user. Additionally, the app should keep a record of how much time the user has spent studying over the course of a week in order to better recommend how they need to change their study habits in the future.

The system will connect to canvas and will automatically add new information to the calendar

based on the classes the user is taking. This will show up visually in the day view of the calendar and the “Coming Up” list.

Customer Meeting

Our Customer has been unresponsive to emails, but did contact one of the team members through the Canvas inbox on Wednesday. By the time the message was discovered on Friday, it was too late to try and schedule a meeting this week.

This week David, Brendan, Conner and Chris each played the role of the customer and identified several new requirements while evaluating the paper prototypes.

Team Member Contributions

Paper Prototypes: Casey, Chris and Conner
New Requirements and Specifications: David, Brendan Chris and Conner
Create Final Draft: Casey