

# CS 361 Software Engineering I

## HW 1: Requirements

### STUDY HABIT PHONE APPLICATION

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October 20, 2019

#### 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.

## 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 Canvas integration which will include:
  - a) Import Calendar information for classes from Canvas.
  - b) User can make changes to their goals and schedules based on their grades imported from Canvas.
13. 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.

### 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.

## 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.

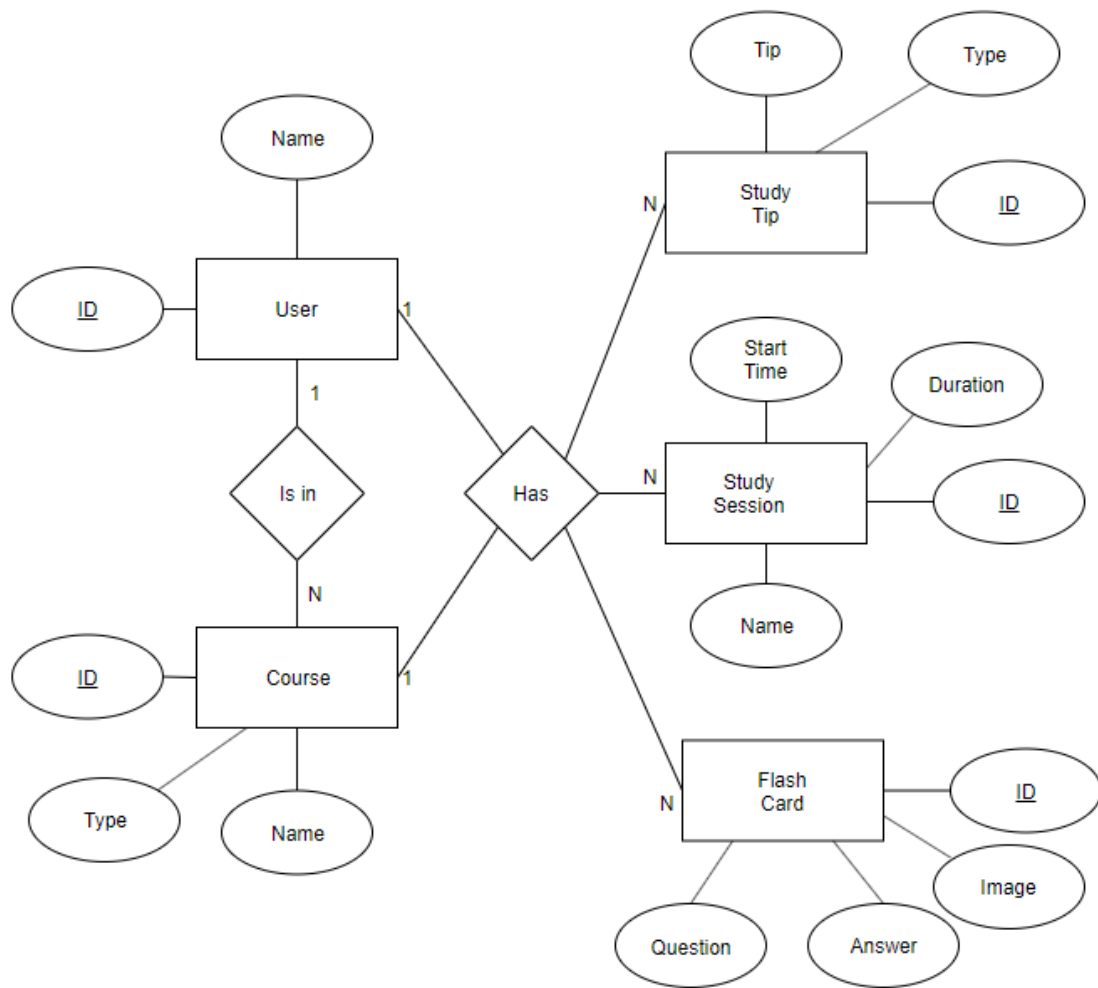
Postconditions:

- 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.

## REQUIREMENTS SPECIFICATION

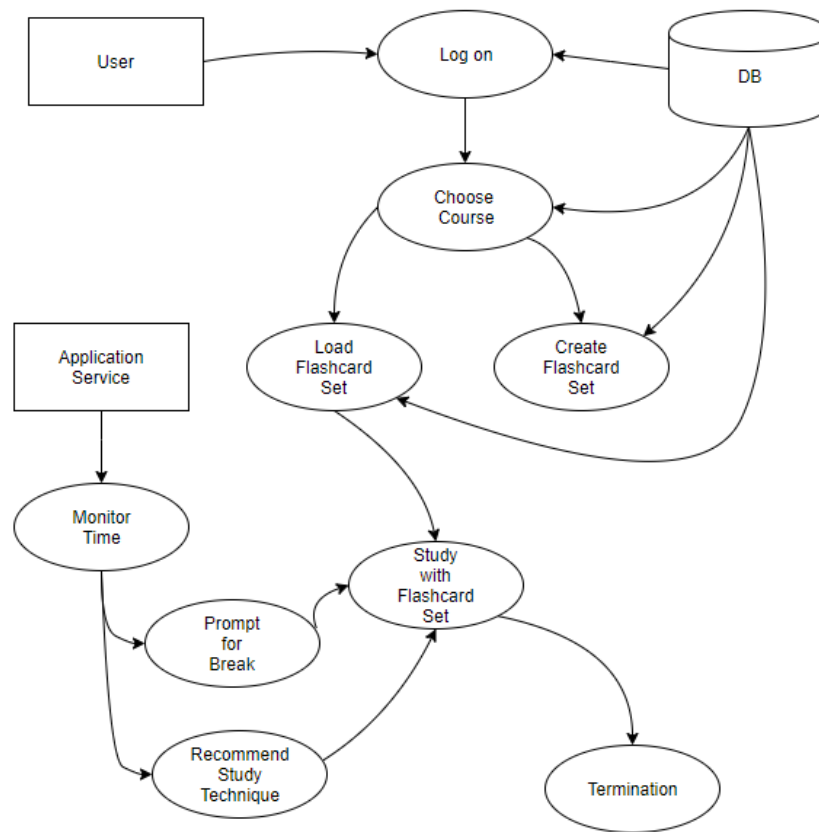
### Functional Requirements

1. System generates new profile for users upon input of user's name, class, and specifications.
2. System compares user's desired grade and weekly time allotments and reports if the time allotment is likely not sufficient.
3. System creates calendar and receives inputs on study appointments in user's profile. System displays calendar for user with study sessions.
4. System detects, creates and pushes notification to host upon the arrival of the study appointment.
5. System blocks host notifications during the study period.
6. 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).
7. System will receive user input to generate a store of flash cards that the user can later view and self quiz.
8. System will interact with Google Docs via an API to receive notes.
9. System will extract strings from image files or use an API to decipher handwritten text.
10. System will interact with Canvas to gather grade information or upload calendars.
11. System will deliver advisory notifications based on grade or study attendance data.

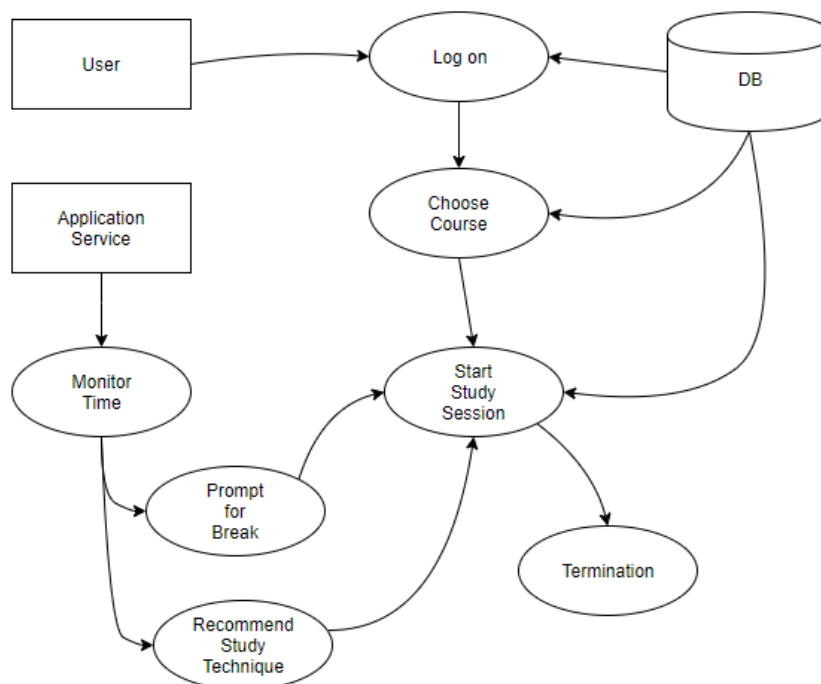
### Non-Functional Requirements

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. System can communicate with canvas to fetch information from the calendar.
7. System authenticates users within 20 seconds.

## DATAFLOW DIAGRAMS FOR IMPORTANT USE CASES

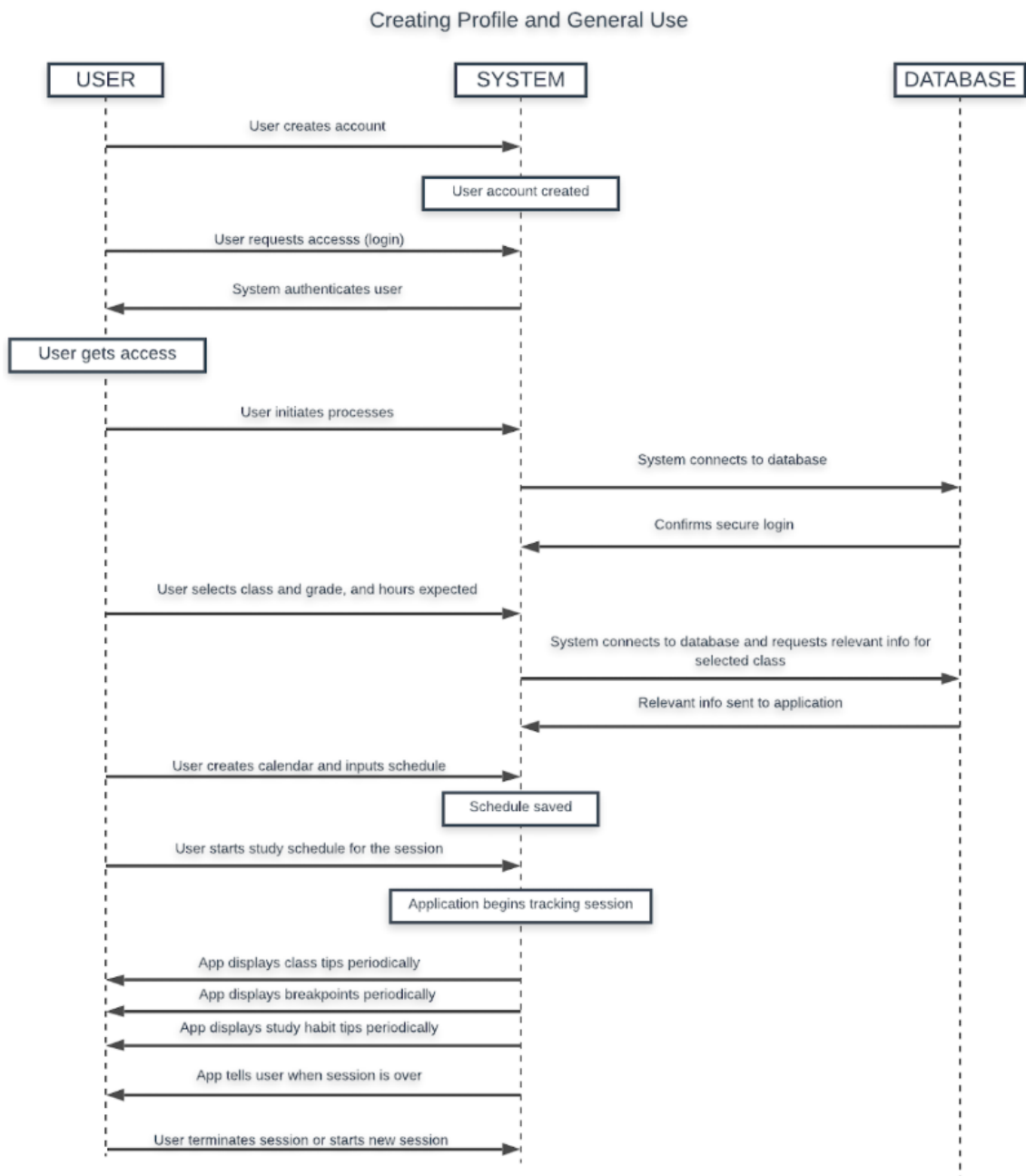


This is a dataflow diagram for the flashcard use case.



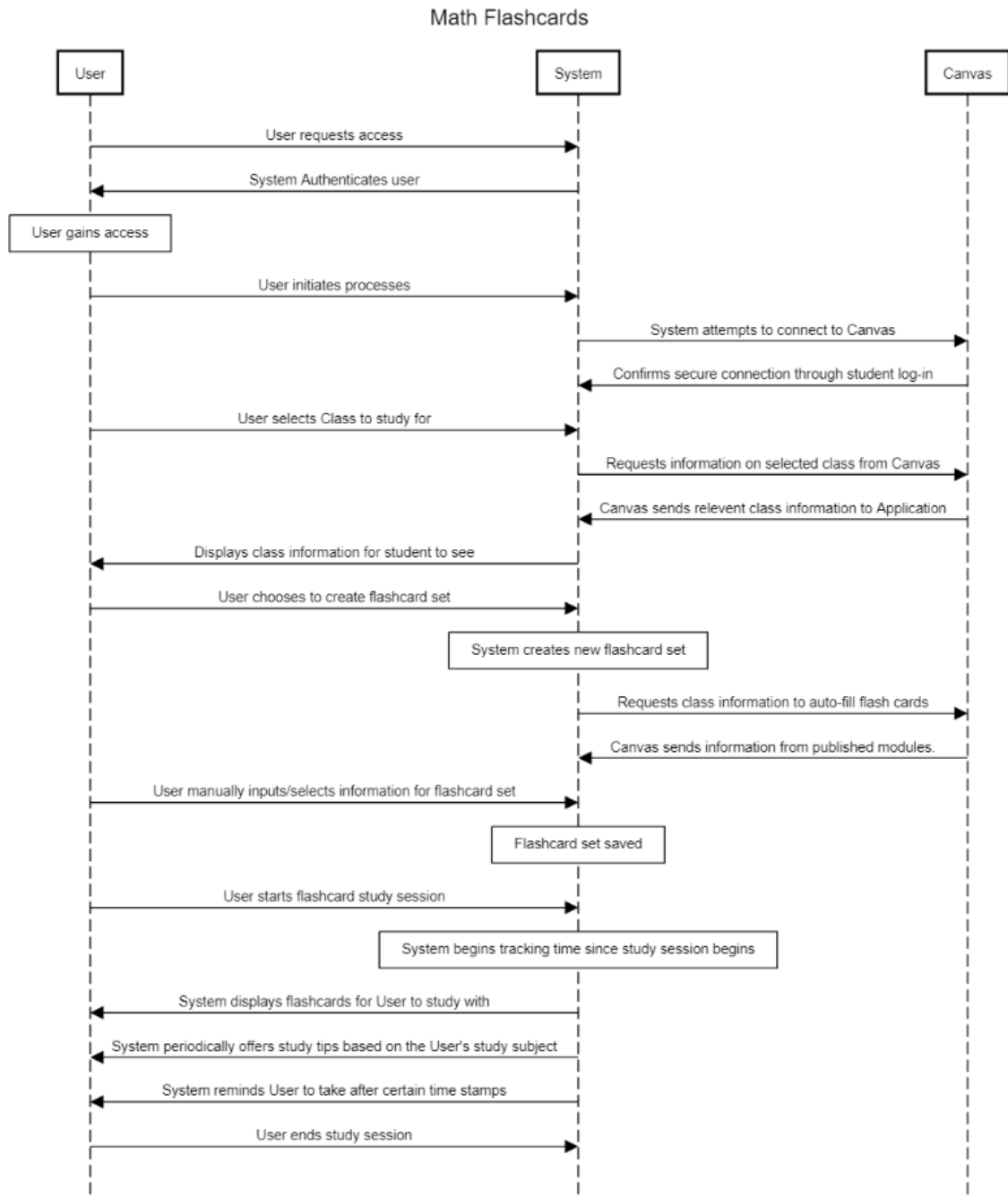
This is a dataflow diagram for the study session use case.

## 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.

## CUSTOMER MEETING

Unfortunately, the team has been unable to reach the customer thus far. Everything in this document has been derived from the proposal alone.

## TEAM MEMBER CONTRIBUTIONS

Requirement specs and definitions: David

ERD and Dataflow diagrams: Casey

Use Cases: Brendan and David

Message Sequence and State Flow: Brendan, Conner, and Chris

Touch up: Conner and Casey

Create Final Draft: Casey