Time Saver

An elegant task management solution, that saves busy people time.

Team:

Anne Aoki: Storyboarding, design, user studies, writing
Alex Anderson: User studies, design
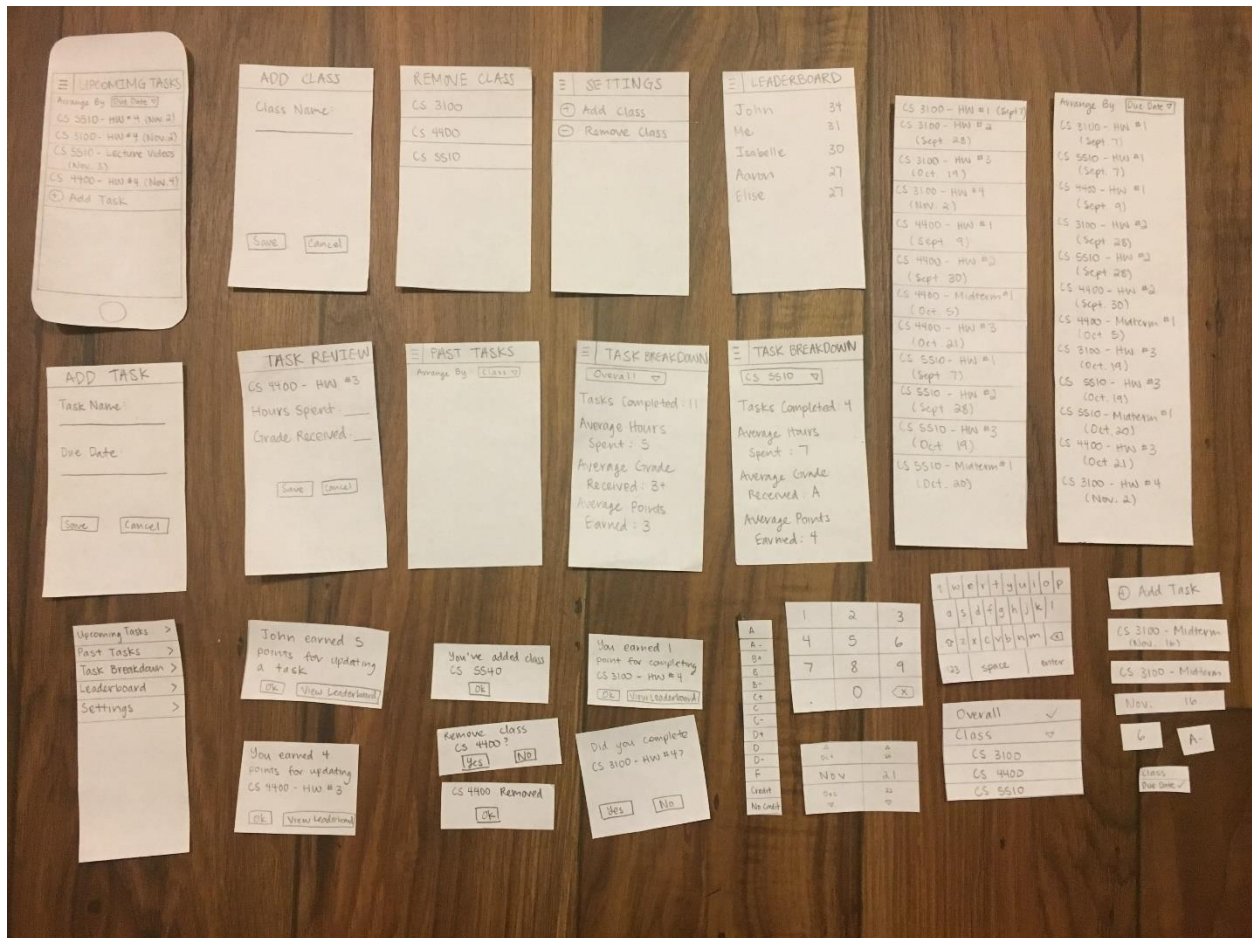**Matt Willden:** Ideation, writing, user studies
Brandon Tobin: Storyboarding, user studies, design

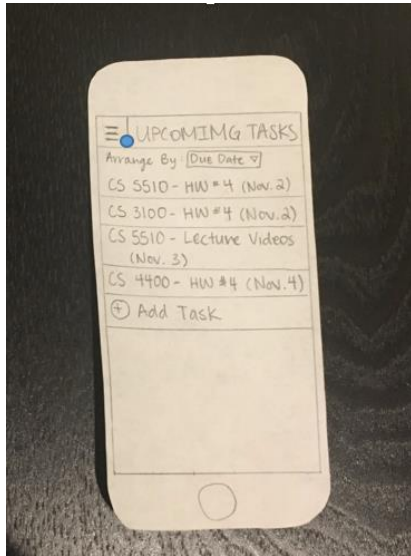## Problem and Solution Overview:

Students are known for having busy schedules and a limited amount of time to complete all their assignments. After a long day of studying, it can be hard to students to analyze how they have spent their time and if they are managing it efficiently. Several scheduling applications exist on the market, but are often forgotten about and go unused. We would like to create a design that will provide an incentive to stay on task and to continue using our application. The incentive to stay on task will help users complete their tasks in a timely manner and help reduce wasted time. The incentive to continue using our application will allow users to see how they spend their time over a long period and help assess how they can improve their time management skills and analyze their overall work ethic.
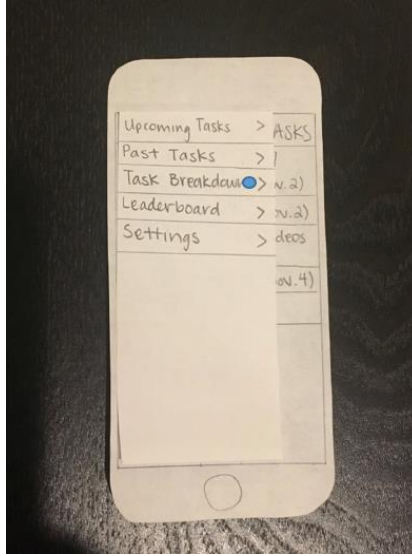
Initial Paper Prototype:

Our paper prototype is a design for a mobile application that allows users to see a list of upcoming tasks. For each task a user completes, they receive a point. After completing a task, a user can review it to earn additional points. Users can then view the leaderboard to see how many points they have and compare the amount of points their friends have. The users can also view detailed breakdowns of how many tasks they have completed, the average time they spend completing each task, the average grade received for each task, and the average amount of points received for each task.
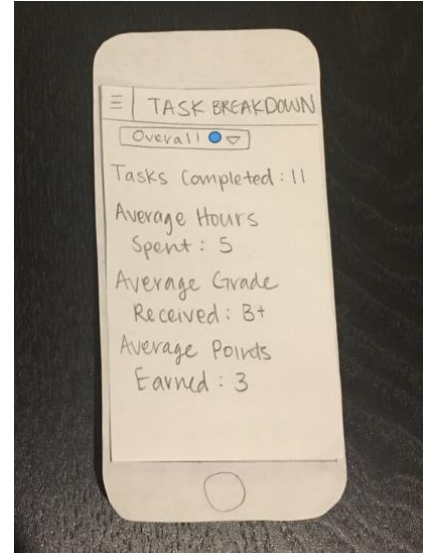
Task 1: Reflect on How Time Was Spent
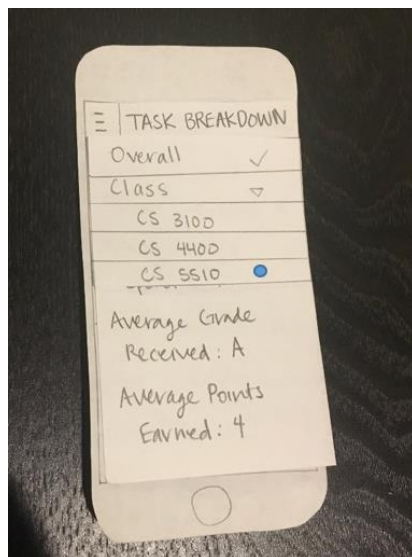

Screen 1.1
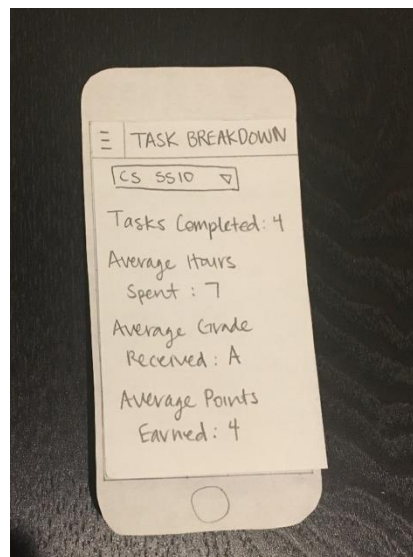

Screen 1.2

Screen 1.3

Screen 1.1: From the main page, the user presses the menu button. This action leads to the option menu (Screen 1.2).

Screen 1.2: When the menu pops up, the user presses the "Task Breakdown" option. This leads to the "Task Breakdown" screen (Screen 1.3).

Screen 1.3: The user can see an overall breakdown of all their tasks in this screen. They can also tap the dropdown menu to access additional task breakdown screens (Screen 1.4).
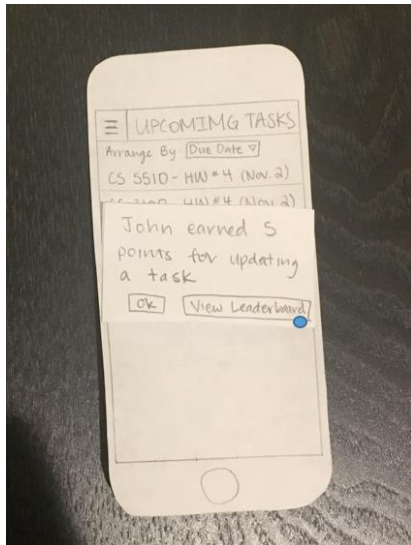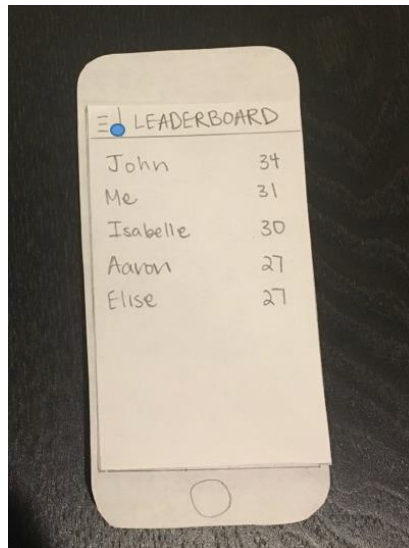

Screen 1.4

Screen 1.5

Screen 1.4: After pressing the dropdown menu, the user can select a specific class to view its task breakdown.

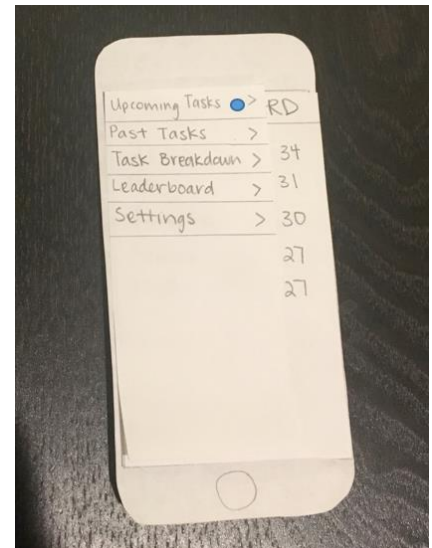Screen 1.5: The user can view the breakdown for a specific class.

Task 2: Finding an Incentive
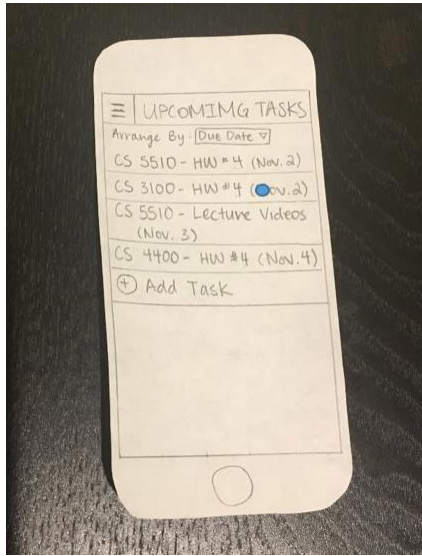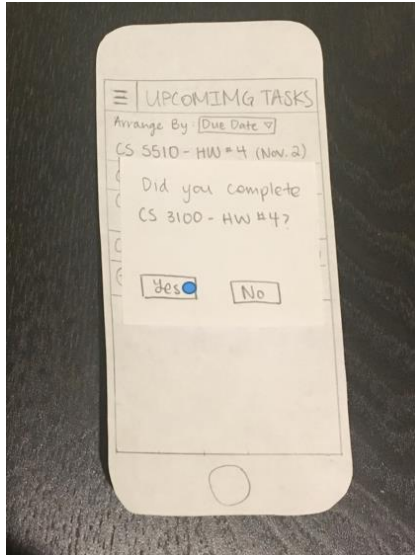

| Screen 2.1 | Screen 2.2 | Screen 2.3 |

Screen 2.1: The user receives a notification that a friend has earned points and wants to view the leaderboard.

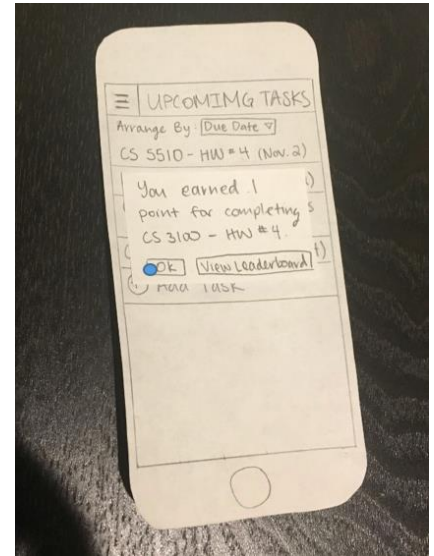Screen 2.2: The user can see their placement on the leaderboard.

Screen 2.3: When the menu pops up, the user presses the "Upcoming Tasks" option.

Screen 2.4   Screen 2.5   Screen 2.6
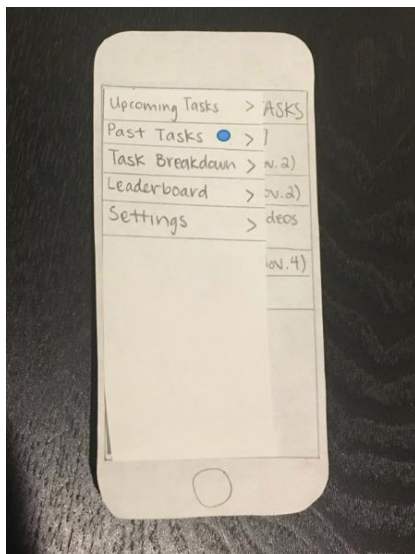
Screen 2.4: When a task has been completed, the user can select a task from the "Upcoming Tasks" page.

Screen 2.5: When a task has been selected, a pop-up will ask if the user has completed the task.

Screen 2.6: The user will receive a pop-up saying that he or she received a point for completing the task.
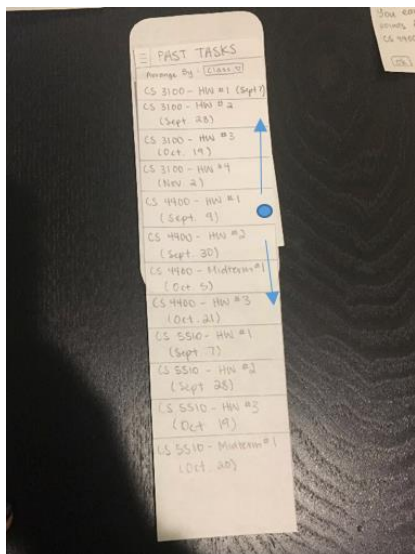
Screen 2.7   Screen 2.8   Screen 2.9

Screen 2.7: When the menu pops up, the user presses the "Past Tasks" option.

Screen 2.8: The user can see the list of all their past tasks and scroll through the menu by sliding it up and down.
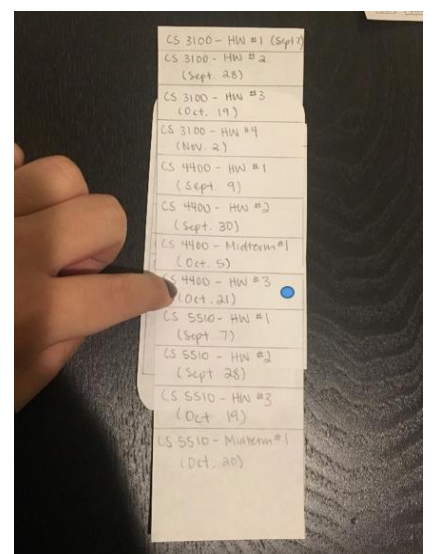
Screen 2.9: The screen after scrolling through the list of past tasks. The user can select a task to review.
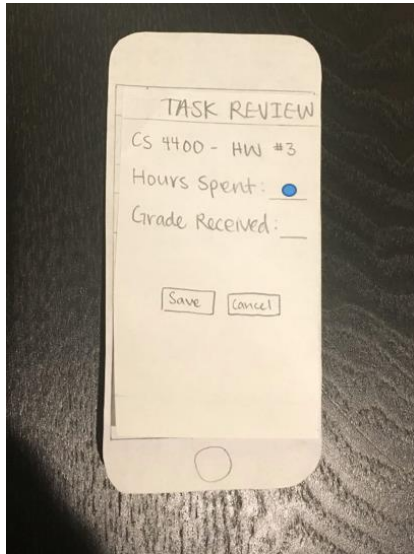
Screen 2.10
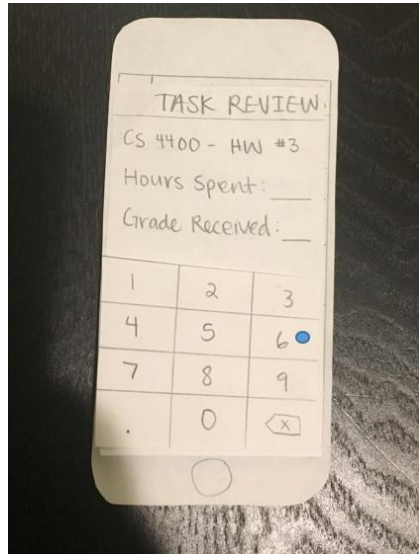
Screen 2.11

Screen 2.12

Screen 2.10: After a user selects a task to review, they can edit the hours spent working on the task.

Screen 2.11: The user can type a numerical value for "Hours Spent".

Screen 2.12: The user can edit the grade received for the task.
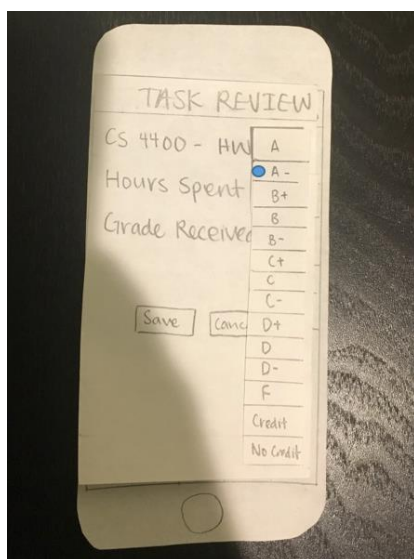
Screen 2.13
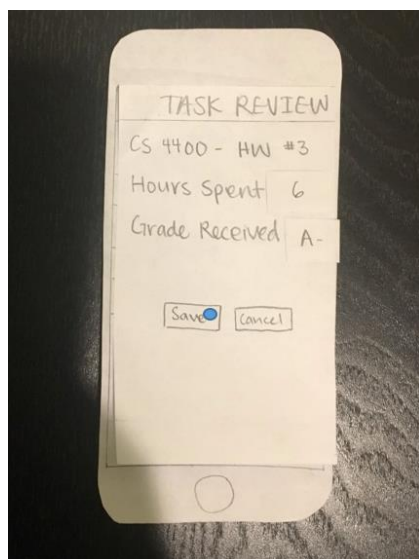
Screen 2.14
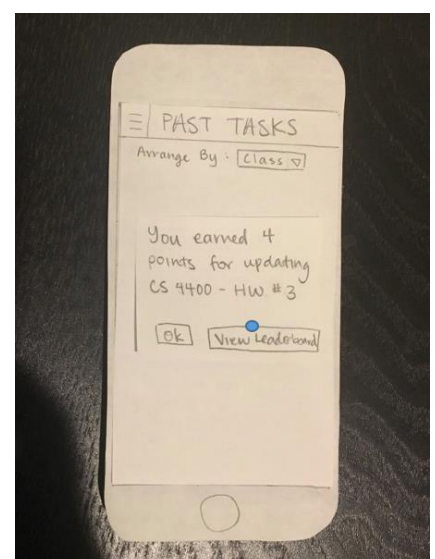
Screen 2.15

Screen 2.13: The user can select a value from the list of grades for "Grade Received".

Screen 2.14: Once all of the information has been added, the user can press save.
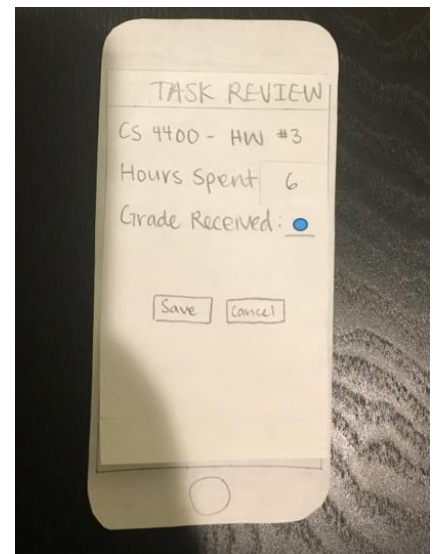
Screen 2.15: After the user updates a task, the user will receive a pop-up notification saying that they have received additional points. From here, the user can choose to view the leaderboard or return to the main screen.
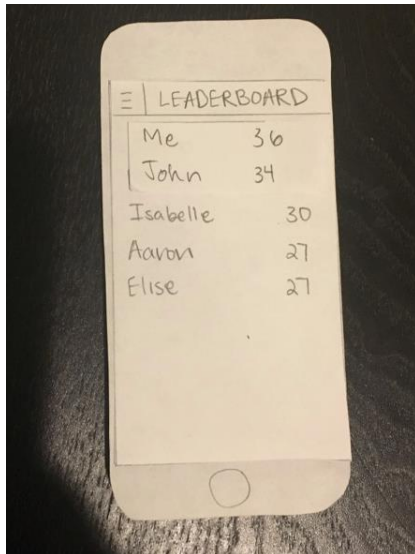
Screen 2.16

Screen 2.16: After the points have been added to the account, the user's position on the leaderboard has changed.

Testing Process:

Methodology

For each test, we talked to the participant before the actual testing began to help the user understand what was expected of them. This included some context on the purpose of our app what tasks we would ask them to perform. All of the tests were performed in the Undergrad Computer Science Lab or the Marriott Library. We chose these locations because they are typical study environments where students would use our application. For all tests, Anne and Brandon switched between being the computer and the facilitator roles and Alex and Matt took on the observer or notetaker role. During the testing session, we encouraged the participant to "talk-through" what they were doing. Upon completion of the tasks, we had a debriefing session where we asked the participant about their experience. If there were any incidents we noticed, we asked about them. We also asked them further questions to see if they were any other incidents we didn't mention. As would be expected, our testing process evolved heavily with each usability test.

Participants

Our first usability test participant was a fellow computer science student in his senior year. He very much represented our typical user since he has a rigorous school schedule, and is taking all upper division computer science courses this semester. The test was conducted in the Undergrad Computer Science Lab in the Warnock Engineering Building.

Our second usability test participant was a mechanical engineering student. He is also a senior and scheduled to graduate in May. While attending school full-time, he also has a job as a technical writer and must balance his school and work responsibilities. This test was performed in Marriott Library.

Our third usability test participant was an English major. She is also a senior who will be graduating in May. We thought it would be valuable to try and find a participant that perhaps wasn't as technically inclined, which is why we opted to test outside of our target user, STEM majors. We also thought that the results of this test could enlarge our target user base if it was found to be accessible and useful to students in general. This test was also performed in the Marriott Library.

Summary

Our first test helped us become more familiar with usability testing in general. We did not provide a sufficient summary beforehand of the application's purpose and rushed into having the user try to complete tasks. We also forgot to ask the participant to talk through their process. Adding these changes in the second in third tests yielded better results. Some of the most valuable information came from having the participants talk through the tasks they were performing as it exposed errors that we most likely would

not have noticed. For our third test, found that getting suggestions from the last participant on what they liked or disliked was also advantageous. It allowed a completely different point of view from our own design. For the first two tests, when we get feedback, it only revolved around what we had already implemented. However, asking for the participant's suggestions at the end of the usability test gave one of our simplest but most obvious ideas: swipe menu for performing tasks.

Testing Results:

Heuristic Evaluations

Our heuristic evaluation happened before any of our usability tests, so we had a chance to address 3 main issues:

1. Recognition vs Recall: When checking off a task, it should allow a user to enter the time spent on that task.
2. Match Between System and Real World: When clicking on a task in the upcoming task screen, it should bring up a menu with options to delete or complete task.
3. User Control and Freedom: When clicking on a task in the past task screen, it should bring up a menu with options to update the task grade, or delete it.
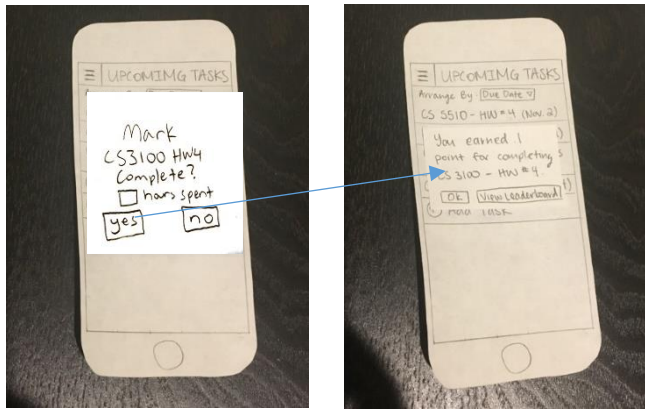
Modifications and Changes

Problem 1:
When checking off a task, a user should be able to enter the time spent on that task.
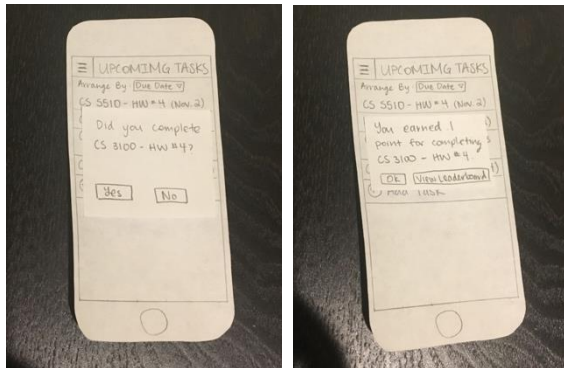
Original
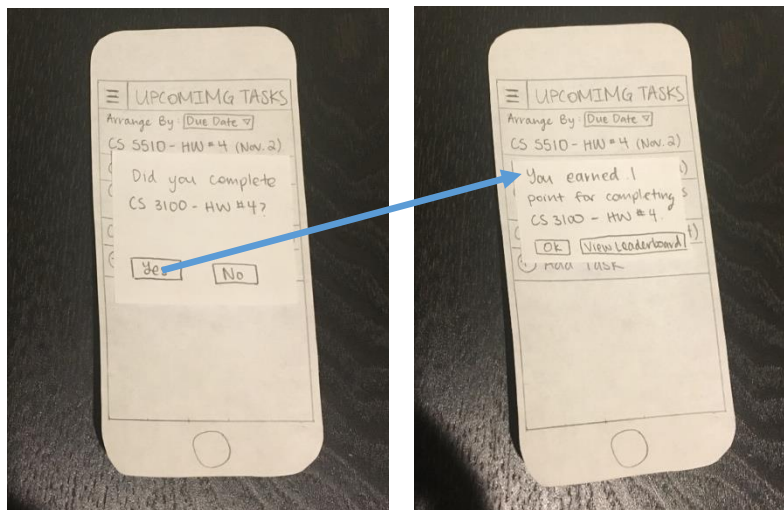
Revision: A popup that asks if the user wants to mark the task as complete with an option to specify hours spent.
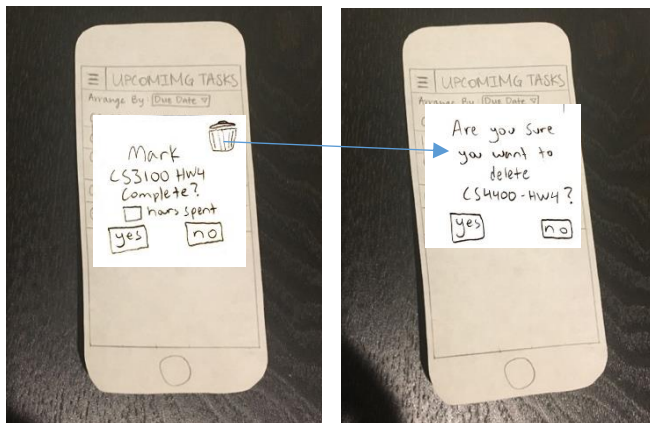
Problem 2:
When clicking on a task in the upcoming task screen, the user should be able to delete or complete the task.
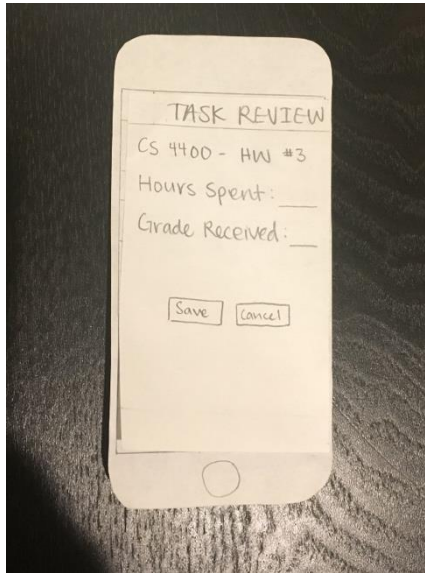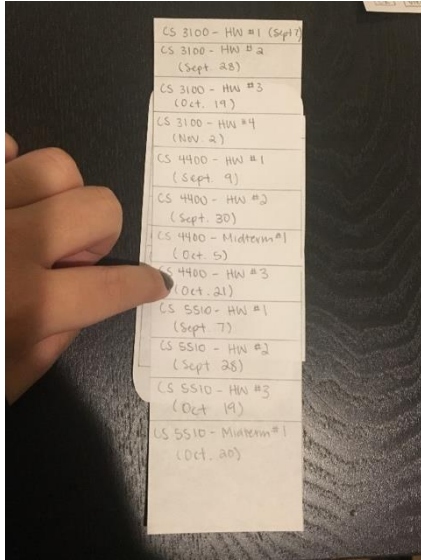
Original

Revision: When selecting a task on the Upcoming Task screen, a new trash can button will allow the user to delete the task.

Problem 3:
When clicking on a task in the past task screen, it should bring up a menu with options to update the task grade, or delete it.
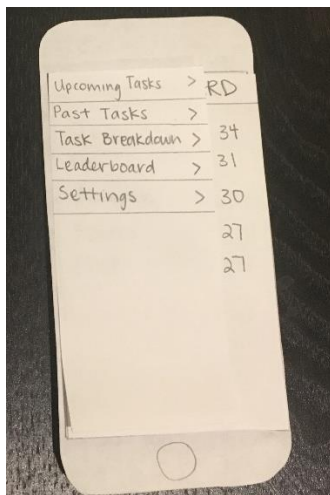
Original

Revision: When selecting a task from the Past Tasks screen, a popup will ask you to update the task or delete it by pressing the trash can icon in the upper right hand corner. After pressing the delete button, a confirmation dialog will popup confirming the deletion.
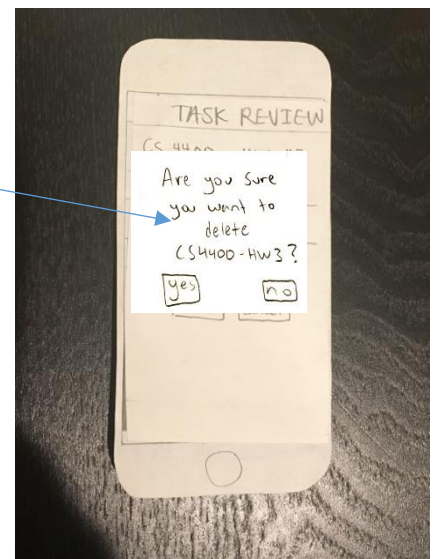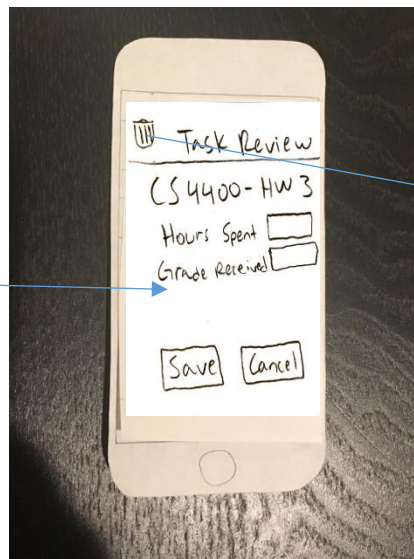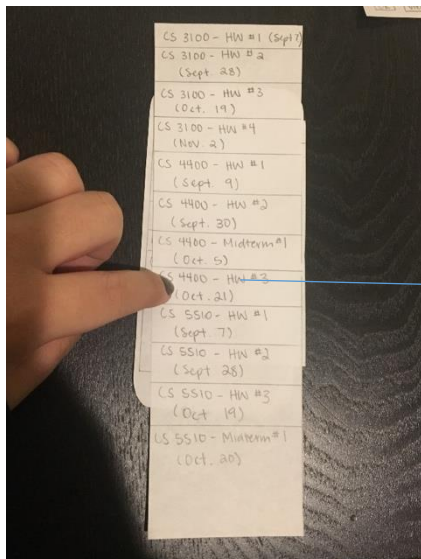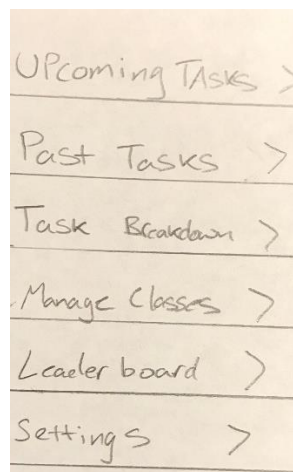
Usability Tests

Test 1

Our first usability test taught us more about the testing process, but we still received helpful feedback for our design. The incident we observed was an issue in figuring out how to add classes. In the hamburger menu, the user was supposed to select "Settings" to manage their classes. We discovered that this label was confusing as core app settings were not being adjusted on this screen and its main job was to add and remove classes. We decided to add the "Manage Classes" option to the hamburger menu to allow direct access to the class management page since it is a crucial aspect of our app's functionality. We chose to leave the "Settings" option in the menu, but use it for actual application settings.
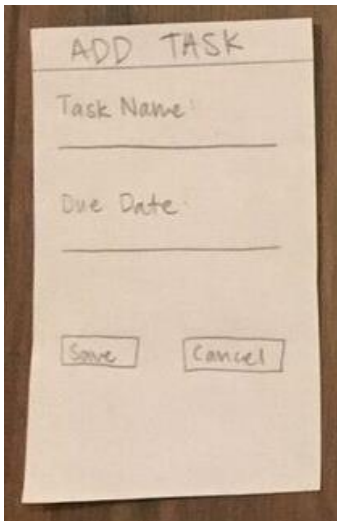

Original Menu

New Menu, with "Manage Classes" option

Test 2

After the first usability test, we made note give the participant a background of the problem our design is solving and to ask the participant to talk through their process. With these changes in our usability test process we received more useful feedback.

A big problem we discovered was that there was no way to directly link a class to a task. Adding a task consisted of simply giving a name and a due date to the task. The class had to be typed at the beginning of the "Task Name" field on the "Add Task" screen. To account for this problem, we added an extra line to the to the "Add Task" screen labeled "Class". On this line, the user could select which class the task is for from a dropdown menu. The remainder of the "Add Task" screen remained the same.

Original Add Task Screen   Revised Add Task Screen, with class selection menu
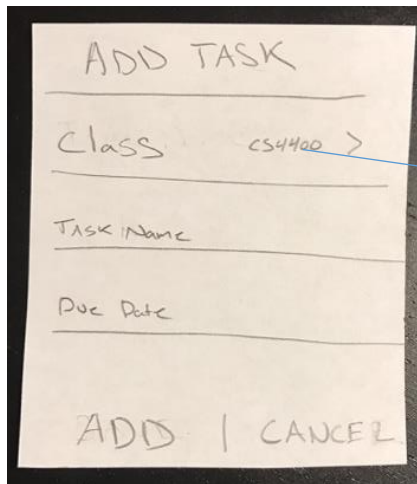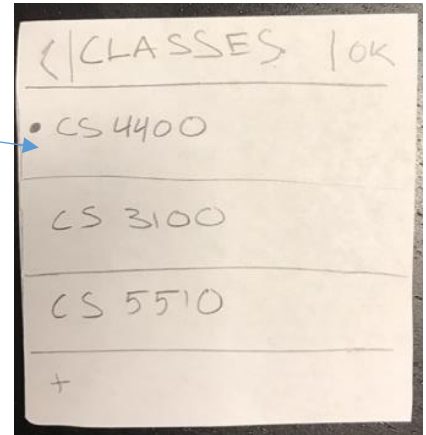
Another incident was that the "Past Tasks" screen did not give any affordances as to which tasks had been fully completed and which tasks still needed grades or times. To account for this, we added a small box to the right of every entry that gave the user a quick glance at several things concerning each entry. Initially, each task shows if the task has a grade saved. If the task has been graded, the amount of points earned for the task is displayed.
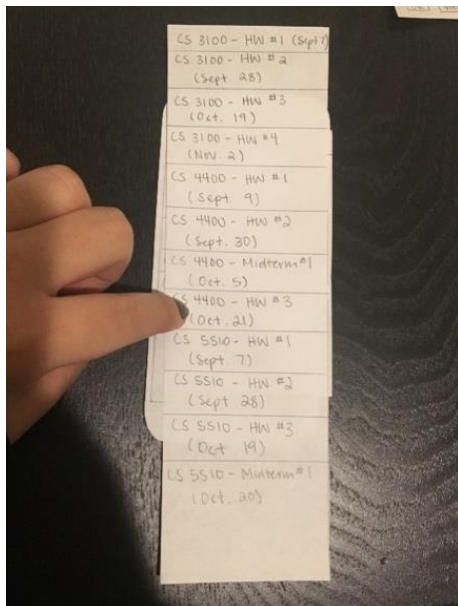
Original Past Tasks Screen   Revised Past Tasks Screen, with additional information
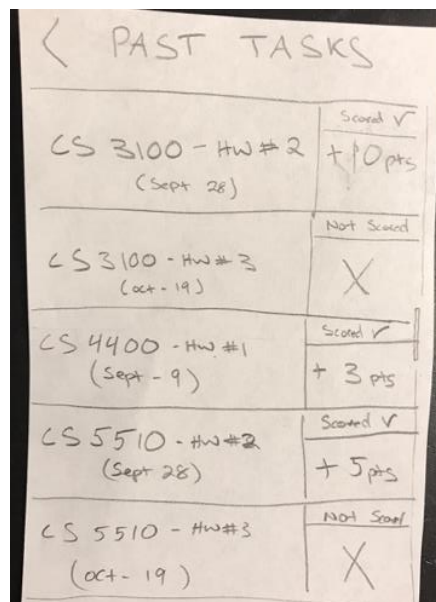
For this test, we went a step further to get user suggestions from our participant upon completing the test. This gave insight on how our design could be more intuitive to use.

The first thing that the user noted was that removing a task was too cumbersome. Also, there was no way to edit a task after it has been created. To account for both of these issues, we added menu that slides in with a swipe gesture on a specific task. The menu allows the user to quickly edit, delete, or mark at task as complete. This was a simple change from what is shown in problem 2 of our heuristic testing section. Here is the new revision:
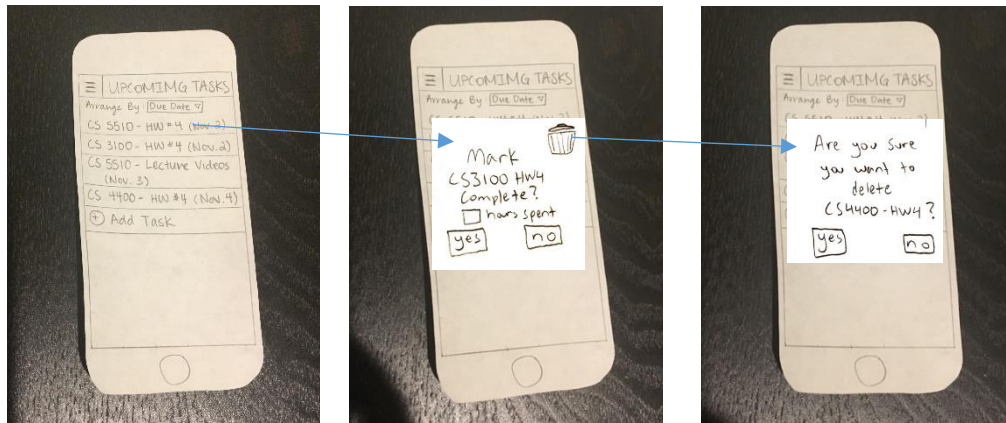
Original Upcoming Tasks Screen
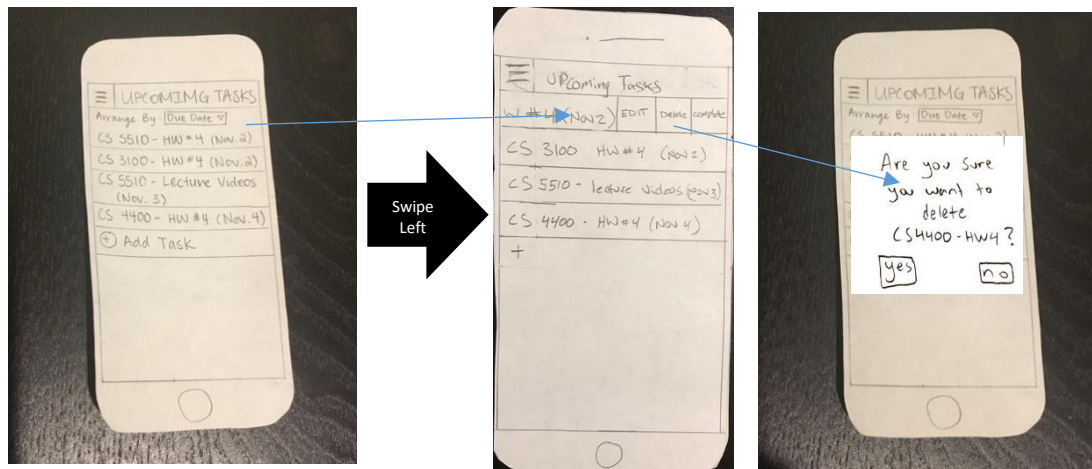
Revised Upcoming Tasks Screen

Second, the user noted that it did not make sense to have a space to add time for completing a task before the user has confirmed that the task is completed. It would make more sense for the user to mark the task as complete and then have the ability to specify the amount of time spent on the task was allowing the user to enter the time when first marking it complete, but before actually receiving a grade for it. It was pointed out by the participant that it could prove difficult to remember the how much time was used after the fact. Here is the revision.
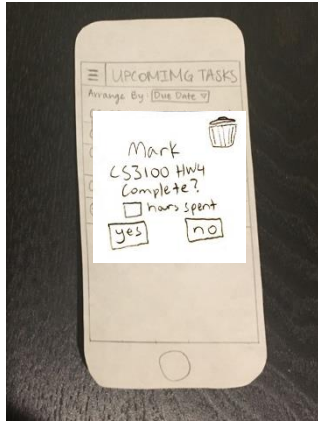
Original Task Completion Popup   Revised Task Completion Popups
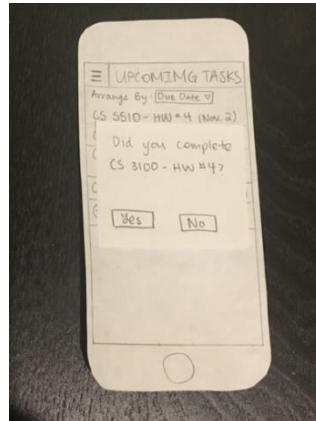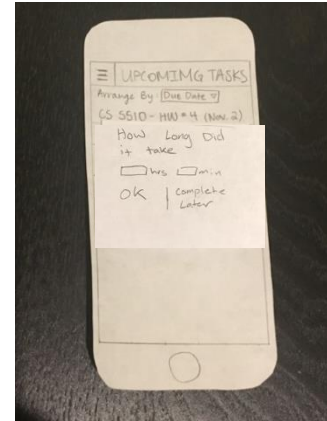
A couple other incidents were reported, one concerning the keyboard and another concerning management of the leaderboard. However, revisions for these weren't incorporated. Keyboards are usually platform dependent and include an "Ok" or "Done" button to close out of the keyboard, which was missing from our prototype. Also, managing the leaderboard is not a possibility considering that it only reports points awarded for each user.

Final Paper Prototype

Task 1: Reflect on How Time Was Spent

Screen 1.1

Screen 1.2

Screen 1.3

Screen 1.1: From the main page, the user presses the menu button. This action leads to the option menu (Screen 1.2).

Screen 1.2: When the menu pops up, the user presses the "Task Breakdown" option. This leads to the "Task Breakdown" screen (Screen 1.3).

Screen 1.3: The user can see an overall breakdown of all their tasks in this screen. They can also tap the dropdown menu to access additional task breakdown screens (Screen 1.4).

Screen 1.4

Screen 1.5

Screen 1.4: After pressing the dropdown menu, the user can select a specific class to view its task breakdown.

Screen 1.5: The user can view the breakdown for a specific class.

Task 2: Finding an Incentive

Screen 2.1   Screen 2.2   Screen 2.3

Screen 2.1: The user receives a notification that a friend has earned points and wants to view the leaderboard.

Screen 2.2: The user can see their placement on the leaderboard.

Screen 2.3: After pressing the menu button, the user presses the "Upcoming Tasks" option.
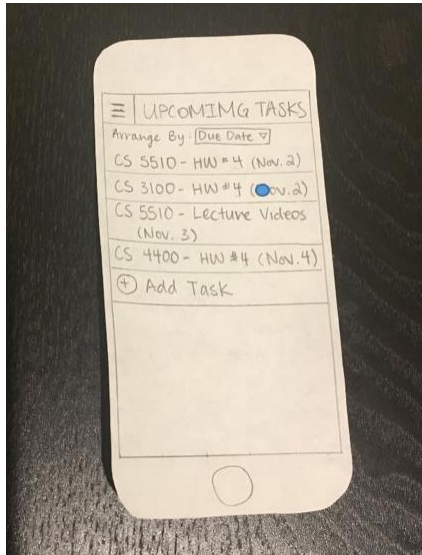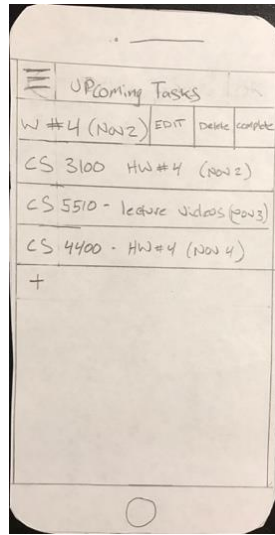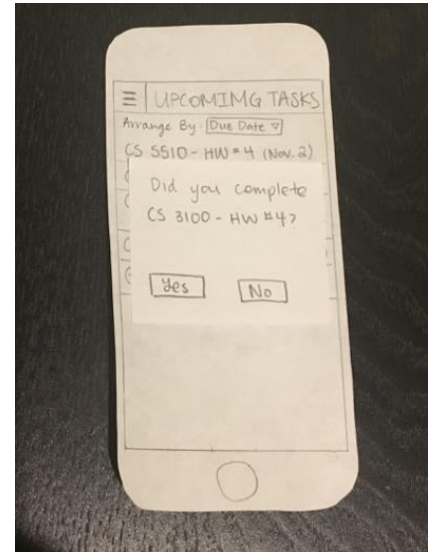
Screen 2.4   Screen 2.5   Screen 2.6

Screen 2.4: When a task has been completed, the user can select a task from the "Upcoming Tasks" page by swiping it to the left.

Screen 2.5: When the slide menu appears, the user can select the "Complete" button.

Screen 2.6: Next, a pop-up will ask if the user has completed the task.
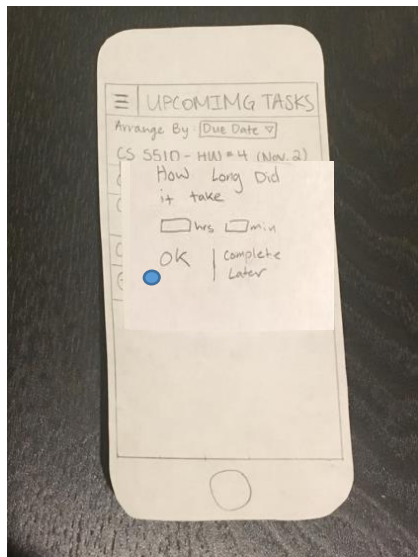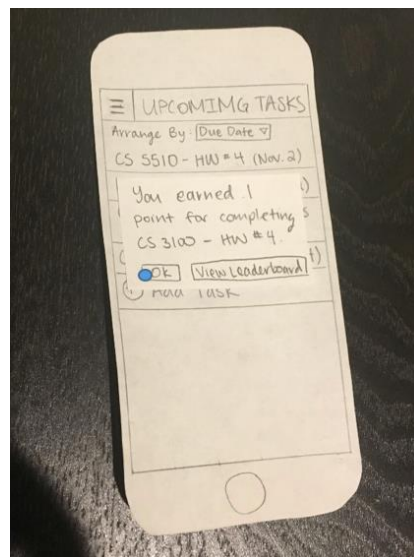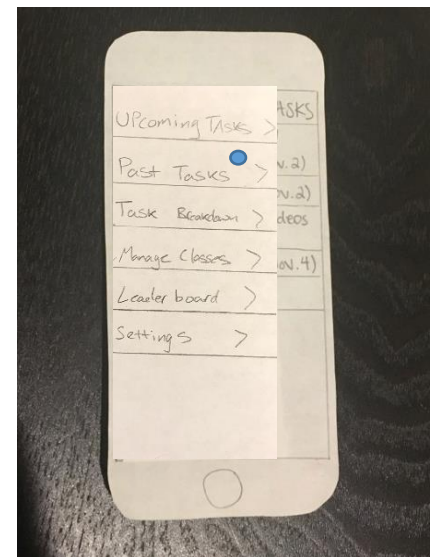
Screen 2.7   Screen 2.8   Screen 2.9

Screen 2.7: The user can now enter the time spent working on the task or choose to fill this out later.

Screen 2.8: The user will receive a pop-up saying that he or she received a point for completing the task. (They still won't get additional points until they enter a grade).

Screen 2.9: The user will press the menu button and the user select the "Past Tasks" option.

CS 3100 - HW #1	Scored
SePT 17	+ 2
CS 3100 - HW # 2	Not Scored
(Sept 28)	X
CS 3100 - HW #3	Scored
(oct 19)	+ 5
CS 3100 - HW #4	Not Scored
(Nov 4)	X
CS 4400 - HW #1	Scored
(SePt 9)	+ 5
CS 4400 - HW 2	Scored
(Sept 30)	+ 5
CS 4400 - Midterm 1	Scored
(oct 5)	+ 10
CS 4400 - HW #3	Non Scored
(oct 21)	X
CS 5510 - HW #1	Scored
(Sept 7)	+ 1
CS 5510 - HW # 2	Scored
(Sept 28)	+ 5
CS 5510 - HW #3	Non Scored
(Oct 19)	X
CS 5510 - Midterm 1	Non Scored
(oct 20)	X

Screen 2.10

TASK REVIEW

CS 4400 - HW #3

Hours Spent: ⬤

Grade Received: ___

[Save] [Cancel]

Screen 2.11

TASK REVIEW

CS 4400 - HW #3

Hours Spent: ___

Grade Received: ___

1	2	3
4	5	6 ⬤
7	8	9
.	0	⬅

Screen 2.12

Screen 2.10: The user can see the list of all their past tasks and scroll through the menu by sliding it up and down. The user can select a task to review.

Screen 2.11: After a user selects a task to review, they can edit the hours spent working on the task.

Screen 2.12: The user can type a numerical value for "Hours Spent".
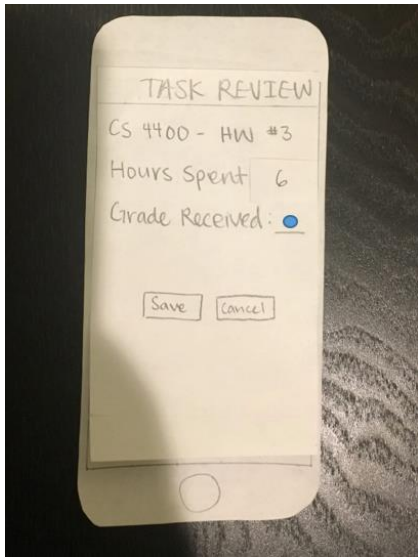
Screen 2.13
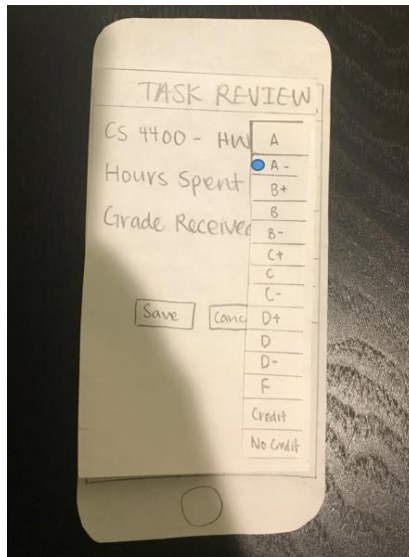
Screen 2.14
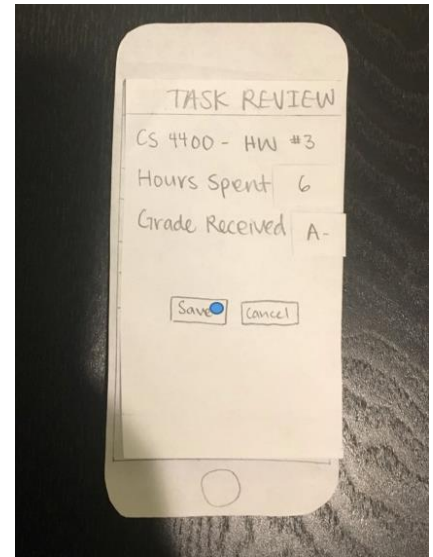
Screen 2.15

Screen 2.13: The user can edit the grade received for the task.

Screen 2.14: The user can select a value from the list of grades for "Grade Received".

Screen 2.15: Once all of the information has been added, the user can press save.
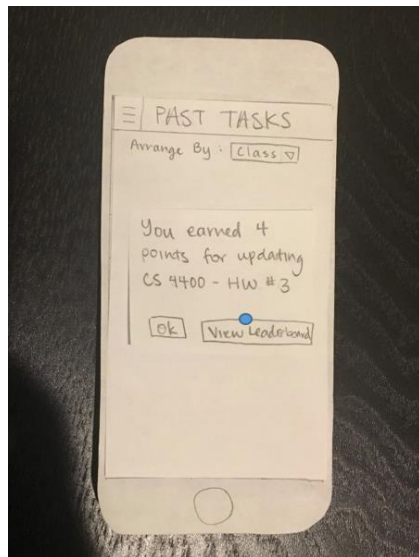
Screen 2.16

Screen 2.17

Screen 2.16: After the user updates a task, the user will receive a pop-up notification saying that they have received additional points. From here, the user can choose to view the leaderboard or return to the main screen.

Screen 2.17: After the points have been added to the account, the user's position on the leaderboard has changed.

Digital Mockup:

In our digital mockup, we tried to give users a rough idea of what our application will be like. We refined our revised paper prototype and added some new features that came from our usability tests like task editing and easier navigation. We also added some soft colors and simple graphics to further illustrate its ease of use.

Task 1: Reflect on How Time Was Spent

In the first task, the application provides a way for users to reflect on how they are doing in their class. It provides average grade, average hours spent per task, and average points earned for that specific class or for all classes if the user wants a more general feel of how they are doing.

| Screen 3.1 | Screen 3.2 | Screen 3.3 | Screen 3.4 |
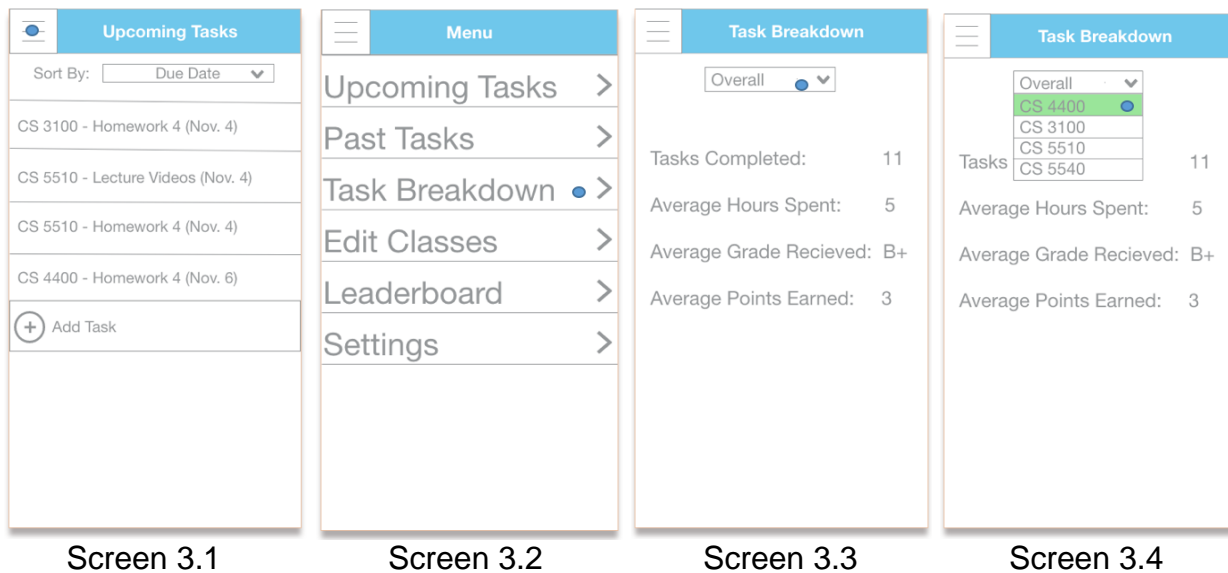
Screen 3.1: From the main page, the user presses the menu button.

Screen 3.2: When the menu pops up, the user presses the "Task Breakdown" option.

Screen 3.3: The user can see an overall breakdown of all their tasks.

Screen 3.4: After pressing the breakdown menu, the user can select a specific class to view its breakdown.

Screen 3.5

Screen 3.5: The user can view the breakdown for a specific class.

Task 2: Finding an Incentive

In the second task, the application provides an incentive to keep the user interested and excited about completing tasks. It adds a competitive edge to task planning. Compete against your friends to see who can achieve the highest score.
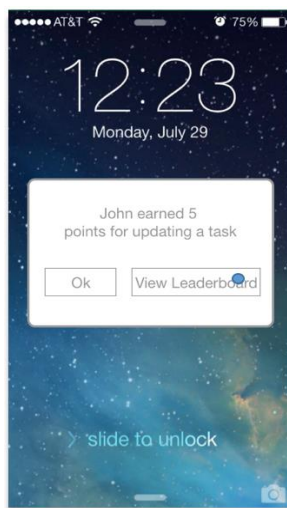
Screen 4.1
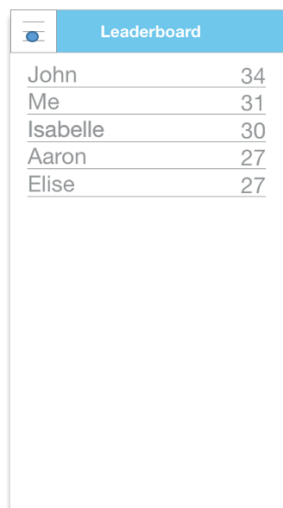
Screen 4.2
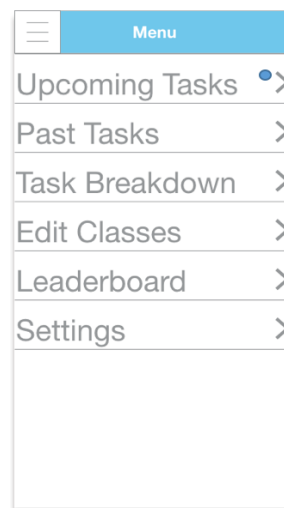
Screen 4.3
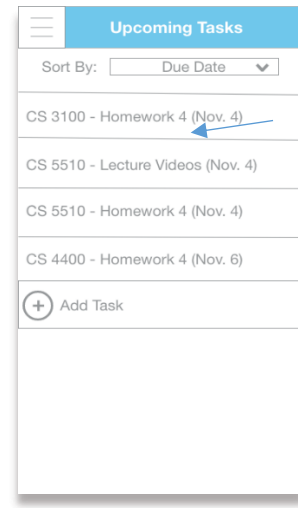
Screen 4.4

Screen 4.1: The user receives a notification that a friend has earned points and wants to view the leaderboard.

Screen 4.2: The user can see their placement on the leaderboard.

Screen 4.3: After pressing the menu button, the user presses "Upcoming Tasks".

Screen 4.4: On the "Upcoming Tasks" page, the user can slide a task to the left and bring up an options menu for the specific task.
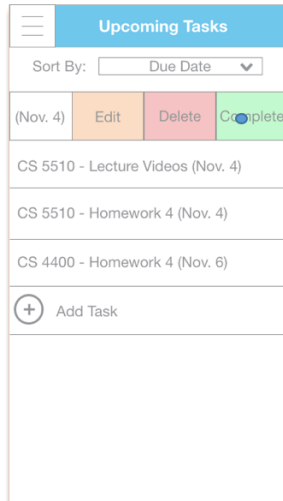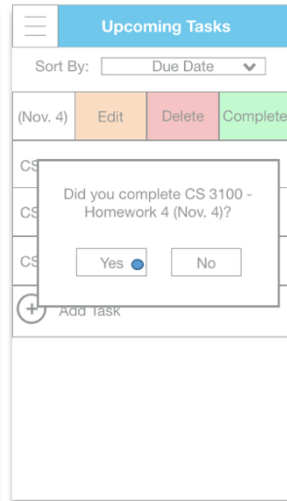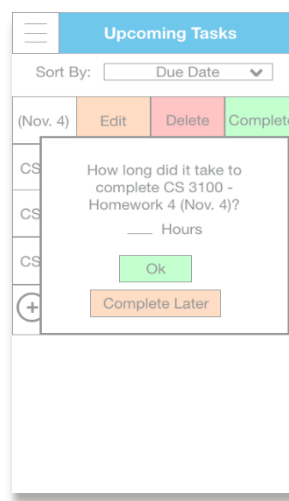
| Screen 4.5 | Screen 4.6 | Screen 4.7 | Screen 4.8 |
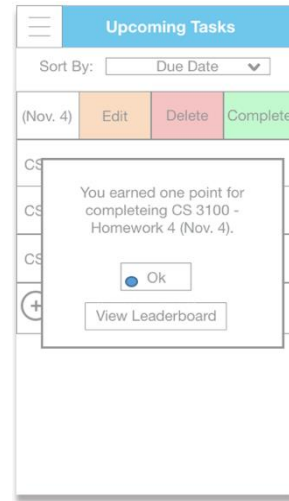
Screen 4.5: When a task has been completed, the user clicks "Complete" from menu.

Screen 4.6: A pop-up will ask if the user has completed the task. The user selects "Yes".

Screen 4.7: The user can now enter the time spent working on the task or choose to fill this out later.

Screen 4.8: The user will receive a pop-up saying that he or she received a point for completing the task.
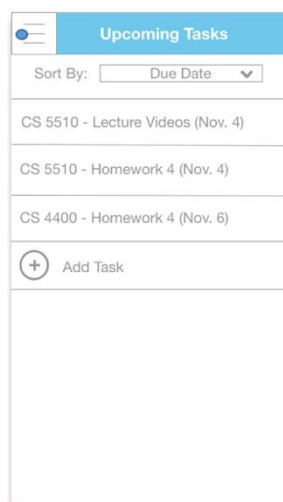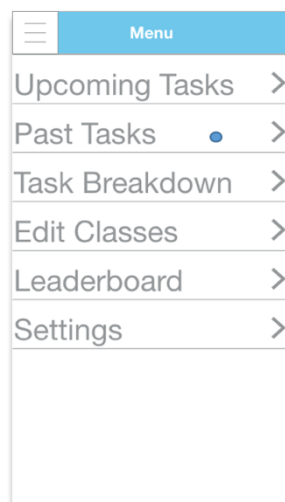
| Screen 4.9 | Screen 4.10 | Screen 4.11 | Screen 4.12 |
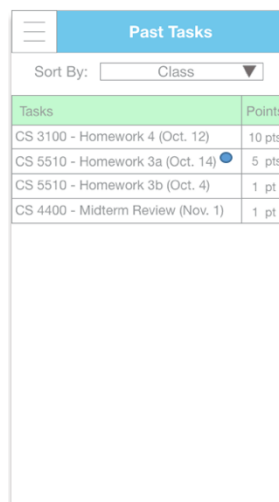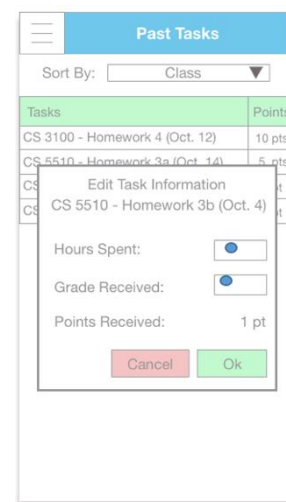
Screen 4.9: The user can see the updated list of upcoming tasks with the completed task removed. The user can now click on the menu button.

Screen 4.10: When the menu pops up, the user presses the "Past Tasks" option.

Screen 4.11: The user can see the list of all their past tasks and select a task to review.

Screen 4.12: After a user selects a task to review, they can edit the hours spent working on the task and the grade received.
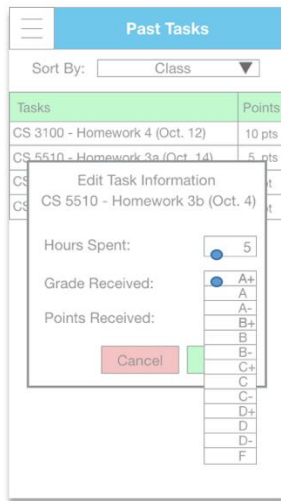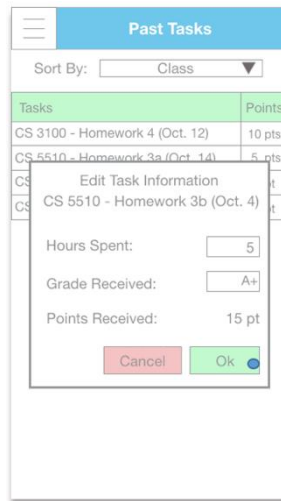
| Screen 4.13 | Screen 4.14 | Screen 4.15 | Screen 4.16 |
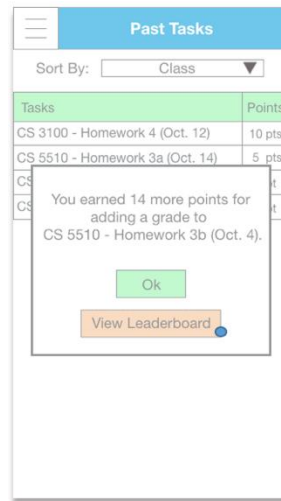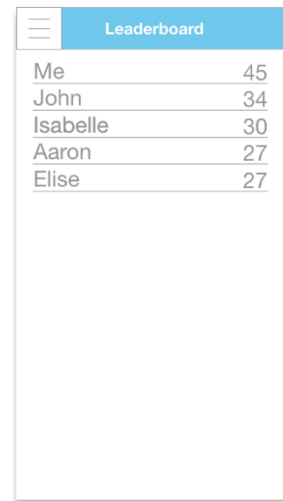
Screen 4.13: The user can type a numerical value for "Hours Spent" and then use the slider to select the grade they received for the task.

Screen 4.14: Once all of the information has been added, the user can press ok.

Screen 4.15: After the user updates a task, the user will receive a pop-up notification saying that they have received additional points. From here, the user can choose to view the leaderboard or return to the main screen.

Screen 4.16: After the points have been added to the account, the user's position on the leaderboard has changed.

Changes and Revisions to Digital Prototype

Overall, our digital mockup is similar to our final paper prototype. However, we briefly expanded on some additions made in the final version of our paper prototype.

The main change that we included was the ability to edit and delete upcoming tasks. Originally, the user could only specify when they completed an upcoming task. We implemented a side swipe menu feature that allows users to edit, delete, or complete a task. When editing a task, the user is taken to a page where they can change the class, the name of the task, and due date. When deleting a task, it will be removed completely from the list of upcoming tasks. (screen 5.1, 5.2, 5.3)

Upcoming Tasks	**Edit Task**	**Upcoming Tasks**
Sort By: Due Date ⌄		Sort By: Due Date ⌄
(Nov. 4) Edit Delete Complete	Class Name:	CS 5510 - Lecture Videos (Nov. 4)
CS 5510 - Lecture Videos (Nov. 4)	CS 3100 ⌄	CS 5510 - Homework 4 (Nov. 4)
CS 5510 - Homework 4 (Nov. 4)	Task Name:	CS 4400 - Homework 4 (Nov. 6)
CS 4400 - Homework 4 (Nov. 6)	Homework 4	⊕ Add Task
⊕ Add Task	Due Date:	
	November 4	
	Add Cancel	

Screen 5.1   Screen 5.2   Screen 5.3

Another change was the addition of a "Edit Classes" tab in the menu. Clicking this option takes you directly to the page where classes can be added and removed. Initially, the user had to go into settings to find this screen. Once the user is on the manage classes page, the user can click the "+" button at the bottom of the list to add a new class. The user can also swipe left on any class to bring up an option to remove a class. (Screen 5.4, 5.5, 5.6)

☰	**Menu**		☰	**Edit Classes**		☰	**Edit Classes**

Screen 5.4

Upcoming Tasks 〉
Past Tasks 〉
Task Breakdown 〉
Edit Classes 〉
Leaderboard 〉
Settings 〉

Screen 5.5

CS 4400
CS 5510
CS 5540
+ Add Class

Screen 5.6

CS 4400
CS 3100   Delete
CS 5510
CS 5540
+ Add Class
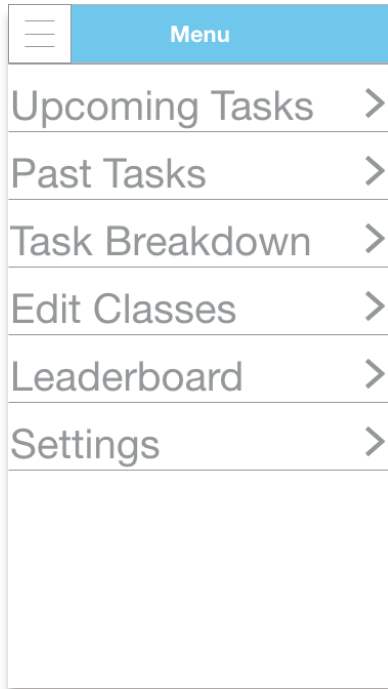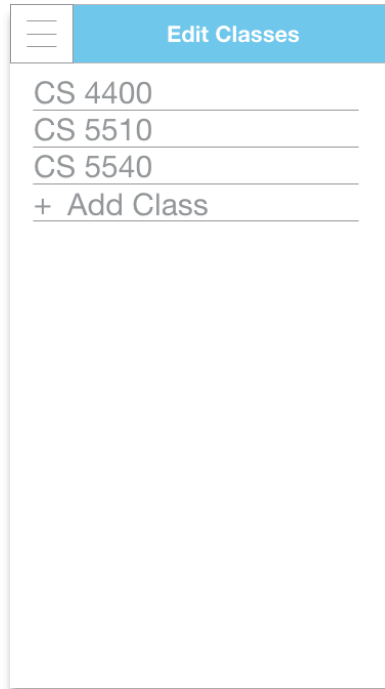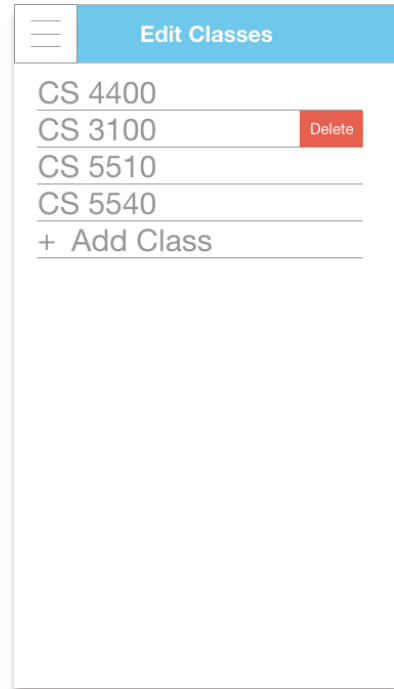
Finally, we have added color to our application. All of our paper sketches were in black and white and we decided to use color to emphasize important buttons and features within our design such as a selection from a list or the buttons on notifications.

Discussion:

The process of iterative design was a new concept for our group, but was critical to our final design. Our initial design was near perfect in our eyes. We had trouble seeing what a usability test or a heuristic evaluation would uncover for our initial paper prototype. However, both the usability testing and the heuristic evaluation discovered many bugs and a few major flaws in our paper prototype. By adjusting our design after each test, we solidified key aspects of our design. This allowed us to find new features to improve with each test. Without the process of iterative design, our digital prototype would have been severely handicapped. Unearthing these flaws led to a streamlined interface that simplified our initial design.

Our tasks have stayed constant throughout our usability tests. We chose our tasks specifically because they encompass the core features of our design. However, the way the users completed tasks changed from iteration to iteration, becoming more streamlined as the design progressed. The first usability test participant had a difficult time trying to add a class. It was unclear where the add class functionality was at. The wording in our menu needed to change from "Settings" to "Edit Classes" and this edit solved the issue for our remaining participants. Another user pointed out that when marking a task as complete, it would be beneficial to record the time spent on the assignment as it is marked complete. These minor changes made a difference for our other participants. The tasks remained the same, but the way to accomplish the task became more intuitive.

The amount of iterations was sufficient to show the iterative design process, but we feel that our design could benefit from a few more iterations. The first few iterations greatly improved our design and more iterations could only uncover more flaws. Also, we could have used some usability tests on our digital prototype. It would be interesting to see how users liked the look and feel of our digital design and to receive more feedback. The next logical step would be to conduct some more iterations on our digital prototype to further refine our design.

Appendix

Materials:

Usability Test Equipment:
- **Laptops**
- **Paper prototype**
- **Note taking instruments**

Usability Test Introduction:

"Hello, my name is [facilitator name]. I am your guide through this usability test for our application. Thank you for participating in this test. We are going to ask you to complete a set of tasks using our paper prototype.

A paper prototype is a paper version of an application that you might use on a smartphone. You can interact with it the same way you would your smart phone. You can touch the paper screen to simulate a press. Our goal is to study how well our application will do with potential users.

This session should take about 5 minutes to complete. With your permission, we would like to take notes and record your actions as you complete the tasks. This is not an evaluation of how well you perform the tasks, but how well our application can facilitate the completion of these tasks.

We would also like you to speak aloud as you move around our prototype, telling us what you are doing as you are doing it. Let us know of any confusion you have and any suggestions as well.

The tasks will be presented to you via a task scenario sheet we will give you before the start of the usability test. Please feel free to ask us for clarification if you find anything unclear about our prototype as well as the test itself. Do you have any questions before we begin?"

Usability Test Task Sheet

Task 1: Add a task to the upcoming tasks screen.

Task 2: Add a class to the class roster.

Task 3: Mark an upcoming task as complete.

Task 4: Add a grade to a past task.

Task 5: View the task breakdown for CS4100.

Critical Incidents:

1. **The user would like the option to add time spent to complete a task when marking the task as complete.**
   - This was brought to our attention during the heuristic evaluation.
2. **The user cannot delete an upcoming task.**
   - This was brought to our attention during the heuristic evaluation.
3. **The user cannot delete a task on the "Past Tasks" screen.**
   - This was brought to our attention during the heuristic evaluation.
4. **The user found it difficult to add or remove classes.**
   - The first participant struggled to find the page where classes could be added or removed. He thought the option in the menu should say something like "Edit Classes" instead of "Settings" to allow easy access to the class management page.
5. **The user cannot intuitively link a task with a specific class.**
   - The second participant was unsure how to link a task with a class. Initially, users had to manually prepend the assignment name with the class associated with the assignment. This could lead to user error.
6. **The user cannot determine which tasks have been graded on the "Past Tasks" screen.**
   - The second participant did not know which tasks needed to have grades added. He thought some indicator that displayed ungraded tasks on the "Past Tasks" screen would be useful.
7. **The user cannot edit any information for an upcoming task.**
   - The third participant mentioned that due dates often change and she could not find a way to edit a task other than deleting it. She said the ability to modify created tasks would be essential.
8. **The user should not be able to add time spent on a task before confirming the task has been completed.**
   - The third participant did not think it made sense to have an "Hours Spent" field on the task completion popup. Instead, she thought the user should confirm the task has been completed and then have a new popup to add time.
9. **The user does not know how to exit out of the numpad.**
   - The third participant was unsure of how to exit the numpad after inputting the required data. This flaw has already been handled for each major operating system (windows, iOS, android), we just forgot to illustrate it in our paper prototype.
10. **The user cannot manage the leaderboard.**
    - The third participant did not understand the purpose of the leaderboard and how the points were accumulated.