Senior Capstonites: FSC Find A Spot

Final Project Documentation Report

Professor Greenwald

BCS 430W

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Juan Flores

May 11, 2021

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Problem Statement

On the campus of Farmingdale State College, many students struggle to find parking closest to their classes. We believe this is a result of the limited parking spots within the campus as well as students lack of knowledge of parking availability. We want students at Farmingdale State College to find parking efficiently. Since the parking issue has caused many impediments for the students, the Senior Capstonites will develop an application that allows students to find parking on campus depending on the lot number selected.

Solution Statement

FSC Find a Spot can help diminish the issue of finding parking. The application itself can help students around the campus to find parking spots in a more efficient manner. This makes the life of the students and the teachers easier. The reason being students will no longer have to arrive late to their classes, which makes teaching the classes easier. Also, this helps improve the parking system of the entire college, by providing parking availability to the students. The FSC: Find A Spot application is made to make the process of finding a parking spot in the heavily populated areas of the campus easily accessible to its students. With an easy to follow application, we ensure the students have a reserved spot throughout the day until they check out. The intended purpose is to relieve the stress of students, make the traffic within the campus exponentially decrease, and have a quick and reliable application that reduces time and efforts.

User Stories Backlog

User Story Feature	User Story Feature Responsibility	Sprint Number	Complete or Incomplete
1. User can check in the reserved spot.	Diana	Sprint 2	Completed
2. User can check out the reserved spot.	Jasmine	Sprint 2	Completed
3. User can reserve their desired spot with the proper requirements.	Juan	Sprint 2	Completed
4. Register On Homepage (Enter Username & Password)	Nosheen	Sprint 2	Completed
5. User will only be able to complete check-out process with RAM ID confirmation	Diana	Sprint 2	Completed
6. Hiding Password with Asterisks (Security Purposes)	Juan	Sprint 2	Completed
7. FSC: Find A Spot will show Available Parking Spots	Nosheen	Sprint 2	Completed
8. If User Doesn't Exist in Firebase (Error Message)	Saad	Sprint 2	Completed
9. User can choose their desired parking lot.	Diana	Sprint 2	Completed
10. User can choose their desired parking spot.	Jasmine	Sprint 2	Completed
11. Unlimited parking time in FSC: Find A Spot	Nosheen	Sprint 2	Completed
12. Wrong Password/Username Message (Error Message)	Saad	Sprint 3	Completed
13. Reset Password Option (Button Added)	Juan	Sprint 3	Completed
14. Calendar Added to Check In System (UI Purposes)	Saad	Sprint 3	Completed
15. Farmingdale Email as Username	Jasmine	Sprint 3	Completed

Stretch Goals

1. Work with Farmingdale IT Department to have Campus Police post parking violations directly onto FSC: Find A Spot
2. Show parking violations for each student and if their parking permit has been renewed
3. Students would be able to pay for traffic violations and permits

Fantasy Goals

1. Implement a Google Maps feature to help user to get to their reserved spot quicker and with less confusion
2. Expand Parking Application to other SUNY Campuses
3. Make a business out of FSC: Find A Spot

Retrospectives

Sprint 1 Retrospective:

Over the course of creating the entirety of Sprint # 1 The Senior Capstonites embraced their new daily/bi-weekly assignments. After the initial demonstration of the Farmingdale State College Find A Spot application, we've tackled the UX/UI portions of the application thanks to Juan using Android Studio. Since the application was meant for students it's probably recommended that a small or mock-up database will be implemented for the application to run using the Ram ID. The user stories and such created by all team members and set up by Jasmine using Trello were also updated in terms of the Ideaboardz. During presentations I know myself and other members of the team may express nervousness and are shy to present sometimes. Throughout the Ideaboardz you can see the sense of build up throughout the sticky notes. A few of the most recent notes expressed our feelings and such over the course of the presentation, problem statement, context diagram with entities, user stories, functionalities, etc.

Sprint 2 Retrospective:

Over the course of creating the entirety of Sprint # 2 The Senior Capstonites embraced their new daily/bi-weekly assignments. After the informal demonstration of the Farmingdale State College Find A Spot application, we've described and showed the class in detail how the application is coming along. Since the application is still under the works in terms of the implementation, students and Professor Greenwald had a few suggestions to add to the UX/UI factor of the app to make it helpful for students along the way of using the application if it were to go live and be used on a daily basis for students at Farmingdale State College. The Requirements Analysis was updated by Jasmine while the Context Diagram and Data Flow Diagrams were updated by Saad. Since the beginning this team expressed their strengths and

weaknesses so we've gotten used to the fact that our duties for our application has become a routine. Nosheen did the ERD along with a description whilst Diana worked on the Database Schema its description and Sprint #2 Retrospective. We're excited to move forward with the application and its benefits it would bring to students at Farmingdale State College.

Sprint 3 Retrospective:

Over the course of creating the entirety of Sprint # 3 The Senior Capstonites embraced their new daily/bi-weekly assignments. For Sprint #3 Juan has implemented around 11 different User Stories to the FSC: Find A Spot application which required a lot of coding but he was able to get it done! For the Context Diagrams and Data Flow Diagrams Saad and Nosheen were able to update it to meet the comments left by Professor Greenwald to ensure that processes 1, 2 and 4 were implemented. Jasmine had updated any User Stories to guarantee that no repetitions amongst them. 15 User Stories must be added to the FSC: Find A Spot Android Application to get the highest grade possible and so far 11 of them are included so the remaining 4 will be added amongst the next couple of weeks. For the Entity Relationship Diagram and Database Schema nothing has been updated because no new entities have been added to the application since it already exists. As we wind down into Sprint #4 the Senior Capstonites will continue their journey into completing the application and any project documentation that is needed for the remaining of the semester.

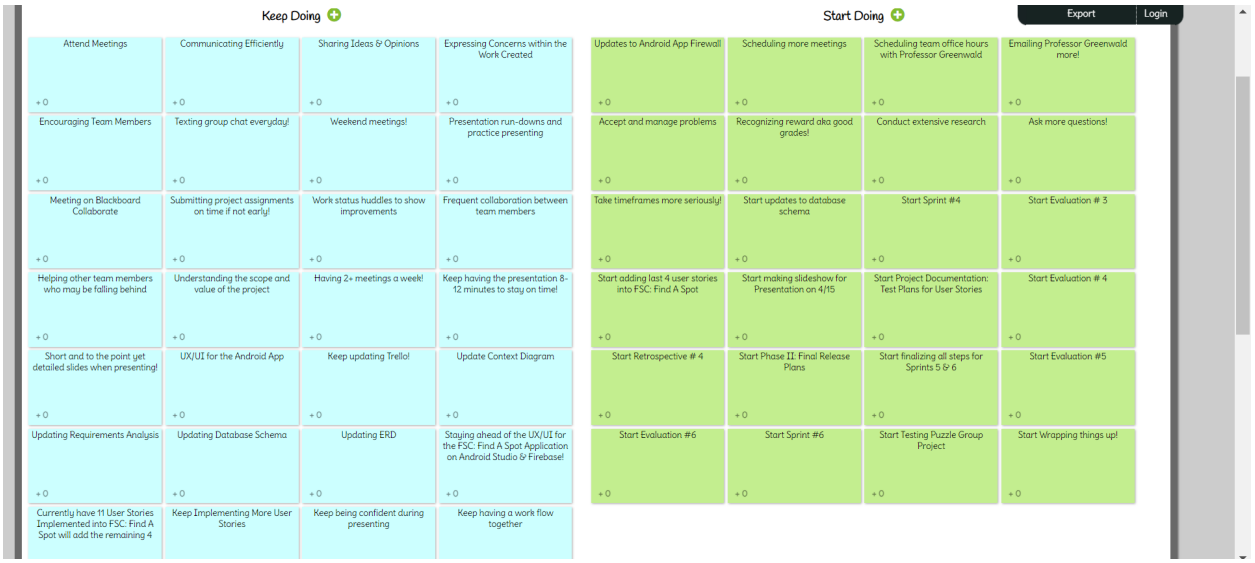
Sprint 4 Retrospective:

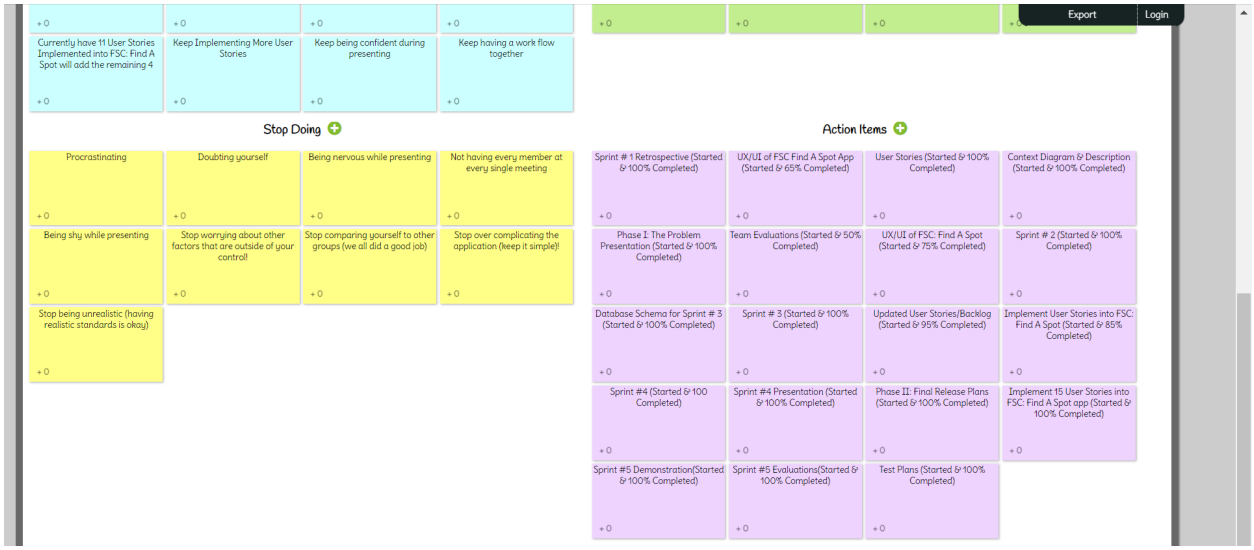
Throughout the last few weeks the Senior Capstonites embraced their duties in order to complete Sprint #4. To start off we've ensured that we went over as a team how and when we should approach our User Stories throughout the Farmingdale State College: Find A Spot application. To target such actions Jasmine and Juan really came together to address the User

Stories and what would work best for the application we've started on Android Studio. We also needed to have the User Stories align with Firebase and the knowledge that Juan knows to have the application running as smoothly as possible. This week the presentation and application demo for Sprint #4 was the best presentation so far as a group. The Senior Capstonites went over everyone's duties and roles to make sure that the presentation was in good shape. Diana stepped up and was feeling less nervous now that the application has completed the User Story features. We're excited to see what's next to come throughout the next couple of weeks for FSC: Find A Spot.

Sprint 5 Retrospective:

As we're wrapping up our documentation and application for Farmingdale State College: Find A Spot, the confidence in our project has been immense. From the completion of Sprint #4 to now the completion of Sprint #5 we genuinely feel as if the main aspects of our project application is complete. As for the documentation as the last couple of sprints pop up throughout the upcoming weeks we have to adjust the documentation to fit the needs of said sprint. For the remainder of the time we've been working on and adjusting the Test Plans that are needed for the E-Sports Team to properly run FSC: Find A Spot and to fill out the User Story Feature(s) Checklist provided to them as well as a list of instructions to open and run the application properly using Android Studio and Firebase. All User Story Features are already implemented into the application so all that's needed is for them to verify everything runs smoothly so our project is ready for the final submission.

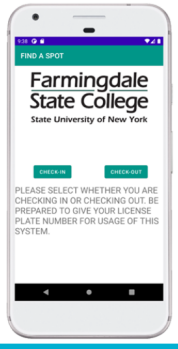

Keep Doing
Attend Meetings
Communicating Efficiently
Sharing Ideas & Opinions
Expressing Concerns within the Work Created
Encouraging Team Members
Texting group chat everyday!
Weekend meetings!
Presentation run-downs and practice presenting
Meeting on Blackboard Collaborate
Submitting project assignments on time if not early!
Work status huddles to show improvements
Frequent collaboration between team members
Helping other team members who may be falling behind
Understanding the scope and value of the project
Having 2+ meetings a week!
Keep having the presentation 8-12 minutes to stay on time!
Short and to the point yet detailed slides when presenting!
UX/UI for the Android App
Keep updating Trello!
Update Context Diagram
Updating Requirements Analysis
Updating Database Schema
Updating ERD
Staying ahead of the UX/UI for the FSC: Find A Spot Application on Android Studio & Firebase!
Currently have 11 User Stories Implemented into FSC: Find A Spot will add the remaining 4
Keep Implementing More User Stories
Keep being confident during presenting
Keep having a work flow together
Start Doing
Export
Login
Updates to Android App Firewall
Scheduling more meetings
Scheduling team office hours with Professor Greenwald
Emailing Professor Greenwald more!
Accept and manage problems
Recognizing reward aka good grades!
Conduct extensive research
Ask more questions!
Take timeframes more seriously!
Start updates to database schema
Start Sprint #4
Start Evaluation # 3
Start adding last 4 user stories into FSC: Find A Spot
Start making slideshow for Presentation on 4/15
Start Project Documentation: Test Plans for User Stories
Start Evaluation # 4
Start Retrospective # 4
Start Phase II: Final Release Plans
Start finalizing all steps for Sprints 5 & 6
Start Evaluation #5
Start Evaluation #6
Start Sprint #6
Start Testing Puzzle Group Project
Start Wrapping things up!


Currently have 11 User Stories Implemented into FSC: Find A Spot will add the remaining 4
Keep Implementing More User Stories
Keep being confident during presenting
Keep having a work flow together
Export
Login
Stop Doing
Procrastinating
Doubting yourself
Being nervous while presenting
Not having every member at every single meeting
Being shy while presenting
Stop worrying about other factors that are outside of your control!
Stop comparing yourself to other groups (we all did a good job)
Stop over complicating the application (keep it simple)!
Stop being unrealistic (having realistic standards is okay)
Action Items
Sprint # 1 Retrospective (Started & 100% Completed)
UX/UI of FSC Find A Spot App (Started & 65% Completed)
User Stories (Started & 100% Completed)
Context Diagram & Description (Started & 100% Completed)
Phase I: The Problem Presentation (Started & 100% Completed)
Team Evaluations (Started & 50% Completed)
UX/UI of FSC: Find A Spot (Started & 75% Completed)
Sprint # 2 (Started & 100% Completed)
Database Schema for Sprint # 3 (Started & 100% Completed)
Sprint # 3 (Started & 100% Completed)
Updated User Stories/Backlog (Started & 95% Completed)
Implement User Stories into FSC: Find A Spot (Started & 85% Completed)
Sprint #4 (Started & 100 Completed)
Sprint #4 Presentation (Started & 100% Completed)
Phase II: Final Release Plans (Started & 100% Completed)
Implement 15 User Stories into FSC: Find A Spot app (Started & 100% Completed)
Sprint #5 Demonstration(Started & 100% Completed)
Sprint #5 Evaluations(Started & 100% Completed)
Test Plans (Started & 100% Completed)

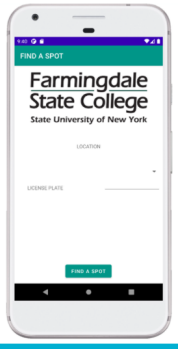
UX/UI Prototype Sketches & System Prototype Mockups

User Interface

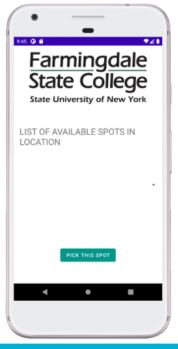
1 Intro Screen



Pick a location

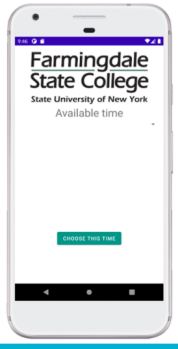


3 Pick a spot

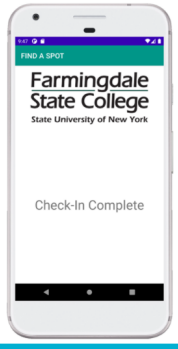


User Interface

4 Pick a time



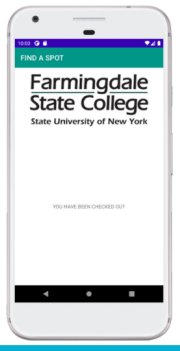
5 Check in complete



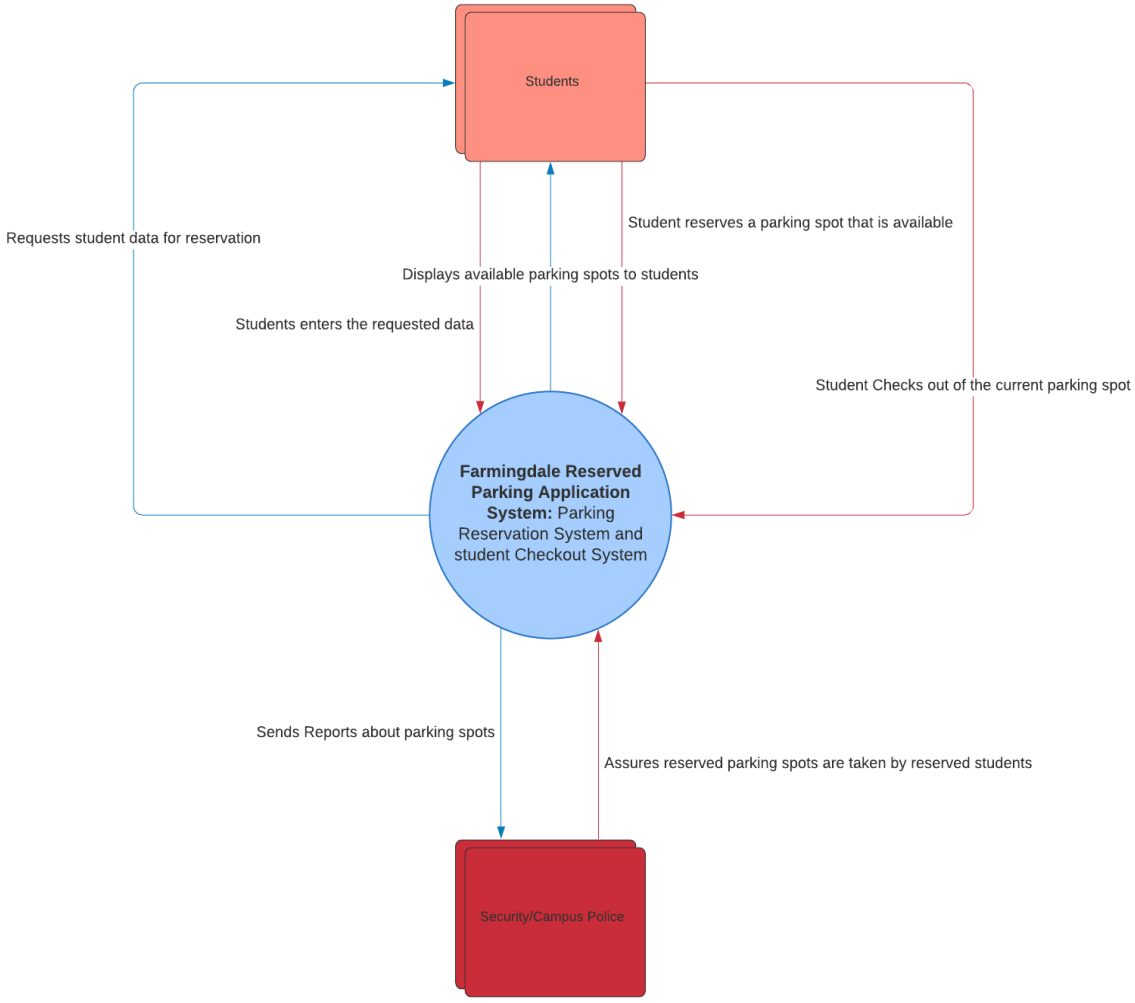
6 Check out screen

User Interface

7 | Check out complete



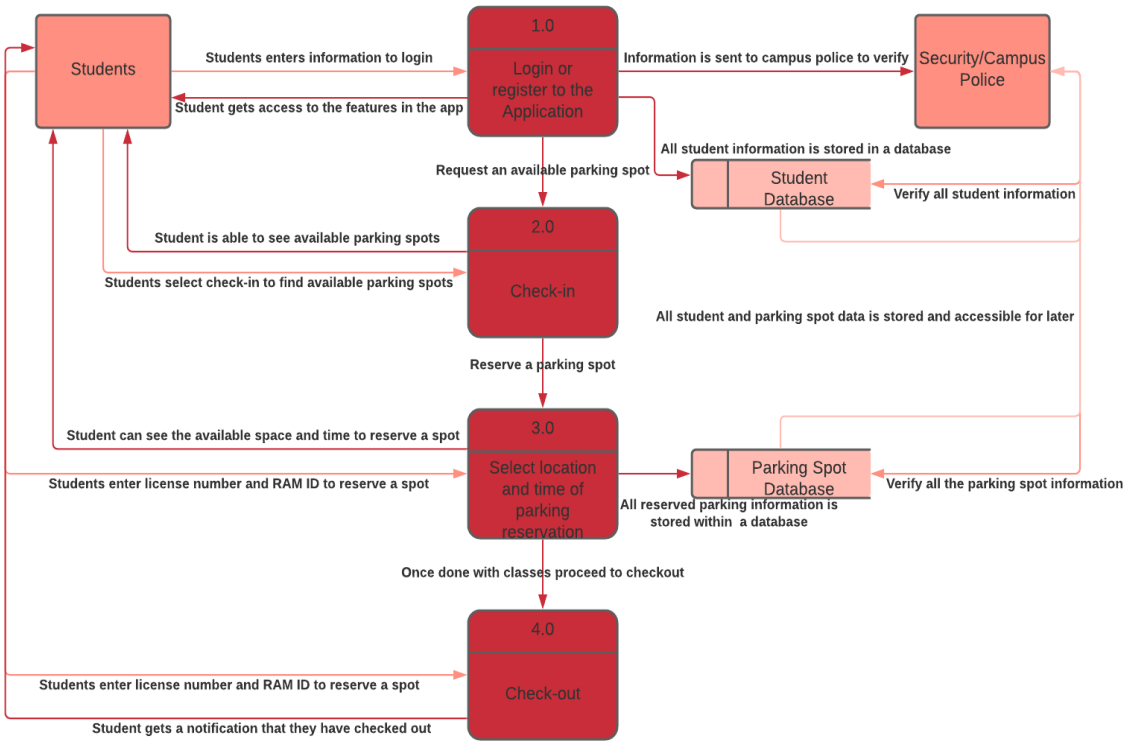
Context and Data Flow Diagrams



The context diagram consists of one information system, which is the Farmingdale Reserved Parking Application System. The application itself has two features. The first feature is the parking reservation system. This feature allows students to provide their personal information and reserve a parking spot that is available. The feature will show students all the available locations and students can request to reserve a spot. The feature then updates the parking availability once a spot is taken. The second feature is the student checkout system. The purpose

of this feature is to show that a student has check-out of their current spot in order to update the parking availability data. The external entities are students and campus police. Students are the ones that will be using the application in order to reserve a parking spot by providing their personal information. The purpose of the campus police is to ensure all reserved parking spots are taken by reserved students. If there are any issues that arise they can look at the application to put everything back in order.

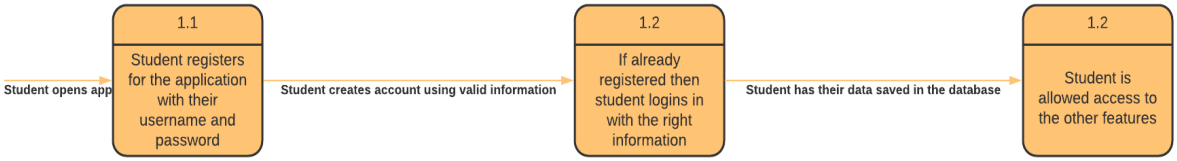
Data Flows Diagram & Description



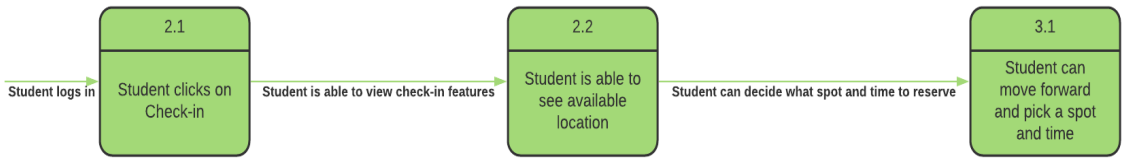
The data flow diagram consists of four main processes. The first process is when the students sign-in or register for the application using their email and password. The second process of the application is the check-in. In this process students can see the available parking

spots. In the third process students will select the exact location and time that they would like to reserve a parking spot. The fourth process allows the students to check-out of the parking spot and it becomes available to other students. The external entities are the students and campus police. The data flow diagram also has two data stores, which are the databases for student records and their parking spots. These databases help keep track of everything in the application. The campus police will have control of these databases and they will help verify it.

Level One DFDs

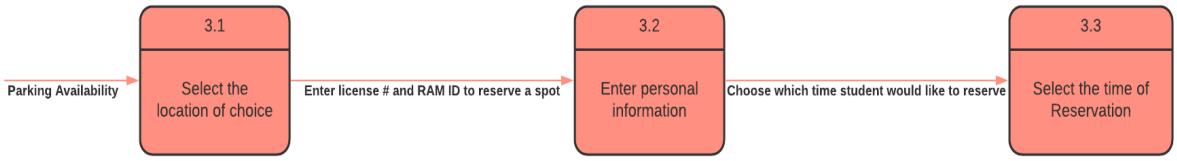


This level one DFD helps break down the first process of the DFD. This diagram shows exactly what processes are used in order to log in to the application. The first process allows the student to register an account with the application using their username and password. The second process will allow students to enter their information if they already have an account. The third process allows the students to enter the application and access the features.

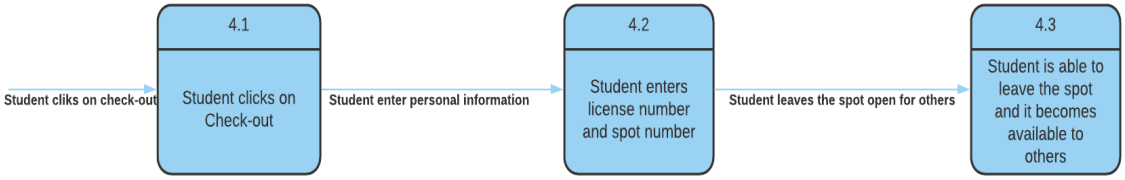


This level one DFD helps break down the second process of the DFD. This diagram shows exactly what processes are used in order to check-in to the application. The first process

allows the student to select the feature. The second process will allow students to view all the spots that are available in order for them to reserve a spot. The third process allows the students to choose the time and location for reservation.

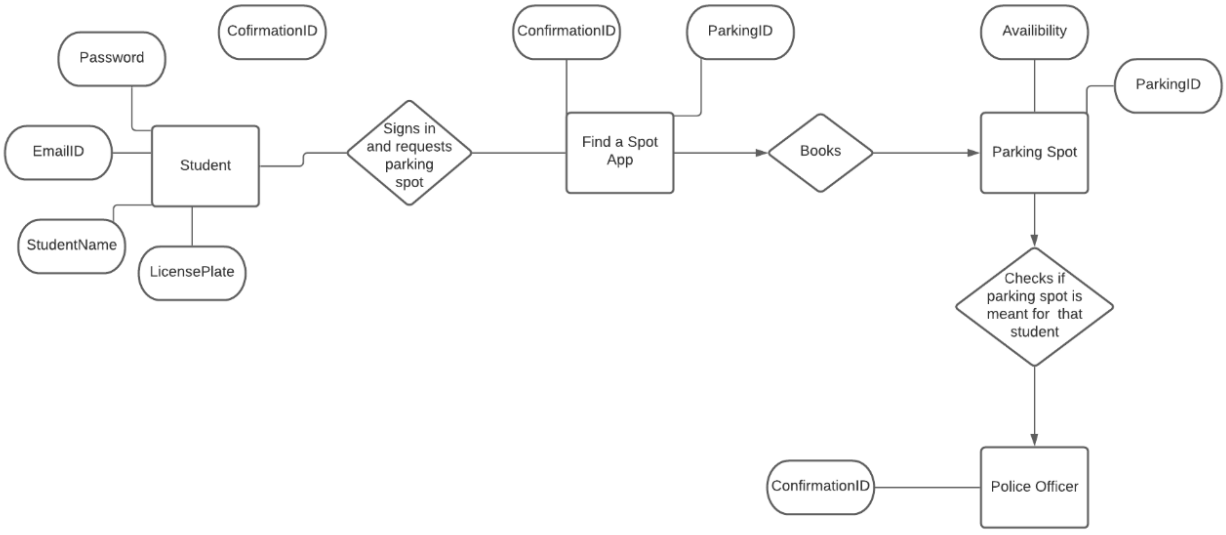


This level one DFD helps break down the third process of the DFD. This diagram shows exactly what processes are used in order to select a parking spot. The first process allows the student to select where they would like to park. They will be selecting which hall is near their classes. The second process will allow students to enter their licence number and RAM ID to reserve a spot. The third process allows the students to choose the time that they would like to reserve a spot.



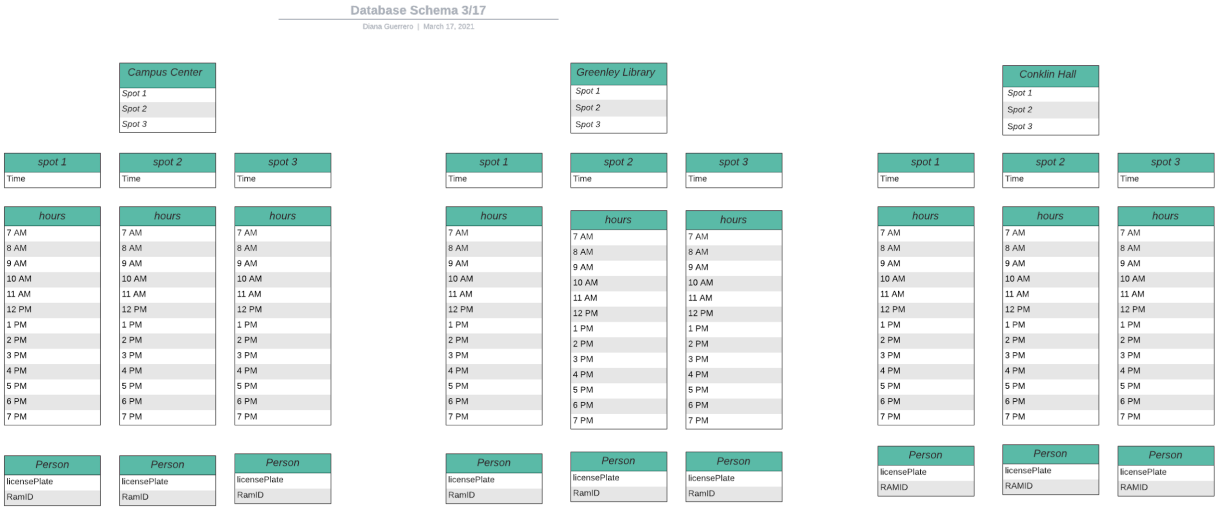
This level one DFD helps break down the fourth process of the DFD. This diagram shows exactly what processes are used in order to check out of the parking spot. The first process allows the student to access the feature. The second process will allow students to enter their licence number and spot number to checkout. The third process will allow the students to leave and have the spot available for other students.

Entity Relationship Diagram



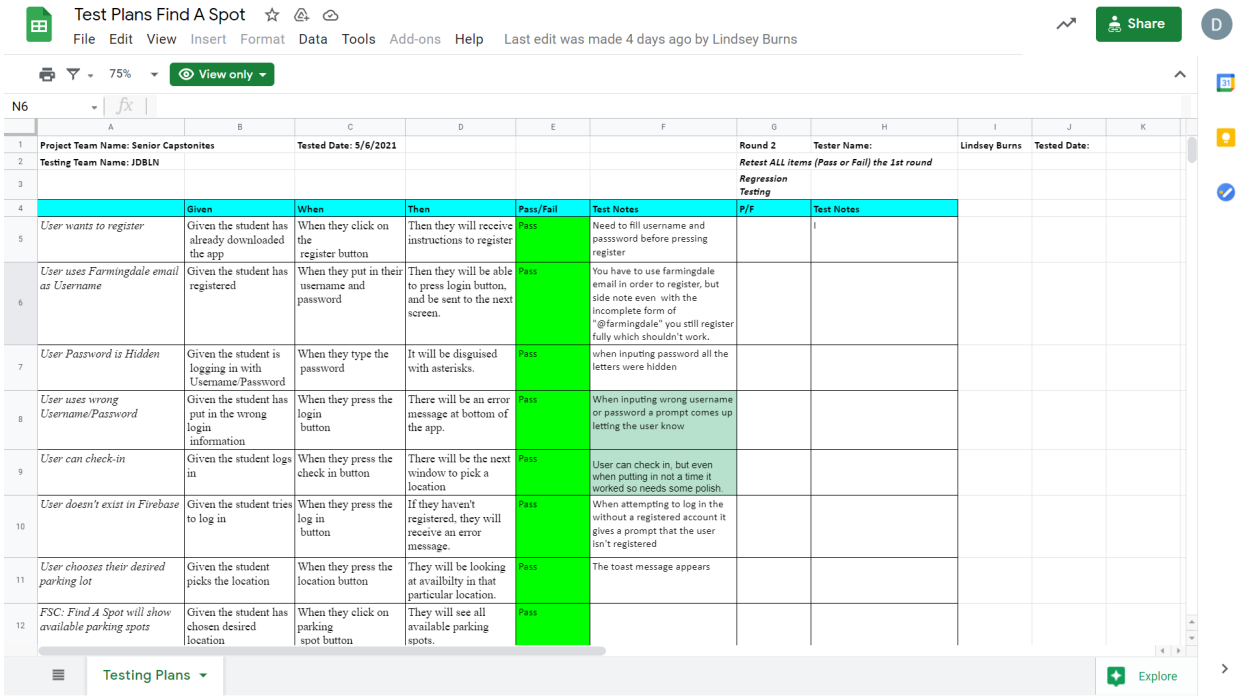
Within this ERD we see 4 important entities: Student, find a spot app, parking spot, and police officer. The process starts with the students, the student attributes: EmailID, StudentName, LicensePlate, Password, ConfirmationID. The student then signs in/registers for the app and requests a parking spot. The find a spot app with the attributes: confirmationID and ParkingID, then reserves the desired parking spot using the attributes: ParkingID and availability, then sends a confirmationID back to the student which has the parkingID needed for them to park at the specific parking spot. To end the relationship diagram the last entity is Police Officer with the attributes: ConfirmationID. The police officer checks if the parking spot is meant for the student based on the confirmationID.

Database Schema



Initially the FSC: Find A Spot application will allow users to choose between the three parking lots: Campus Center, Greenley Library, and Conklin Hall. From there the user will be able to choose a spot and reserve their time to be in the chosen parking spot. From there the student will be able to input their RamID and license plate to reserve said spot. The student's will be able to login using an email system linked with their Farmingdale Gmail and password, in order to register they will be able to do so on the FSC: Find A Spot application.

Completed Test Plans



Test Plans Find A Spot

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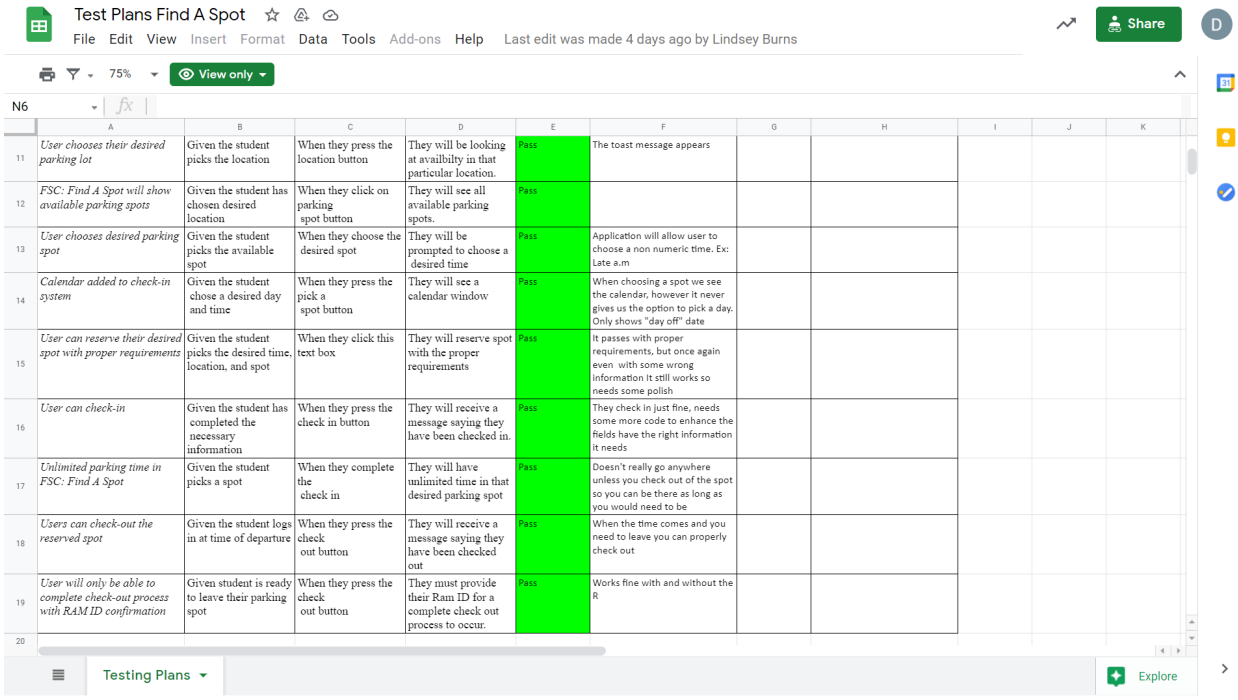
	A	B	C	D	E	F	G	H	I	J	K
1	**Project Team Name: Senior Capstonites**		**Tested Date: 5/6/2021**				**Round 2**	**Tester Name:**	**Lindsey Burns**	**Tested Date:**	
2	**Testing Team Name: JDBLN**						***Retest ALL items (Pass or Fail) the 1st round***				
3							***Regression Testing***				
4		**Given**	**When**	**Then**	**Pass/Fail**	**Test Notes**	**P/F**	**Test Notes**			
5	*User wants to register*	Given the student has already downloaded the app	When they click on the register button	Then they will receive instructions to register	Pass	Need to fill username and passsword before pressing register		I			
6	*User uses Farmingdale email as Username*	Given the student has registered	When they put in their username and password	Then they will be able to press login button, and be sent to the next screen.	Pass	You have to use farmingdale email in order to register, but side note even with the incomplete form of "@farmingdale" you still register fully which shouldn't work.					
7	*User Password is Hidden*	Given the student is logging in with Username/Password	When they type the password	It will be disguised with asterisks.	Pass	when inputing password all the letters were hidden					
8	*User uses wrong Username/Password*	Given the student has put in the wrong login information	When they press the login button	There will be an error message at bottom of the app.	Pass	When inputing wrong username or password a prompt comes up letting the user know					
9	*User can check-in*	Given the student logs in	When they press the check in button	There will be the next window to pick a location	Pass	User can check in, but even when putting in not a time it worked so needs some polish.					
10	*User doesn't exist in Firebase*	Given the student tries to log in	When they press the log in button	If they haven't registered, they will receive an error message.	Pass	When attempting to log in the without a registered account it gives a prompt that the user isn't registered					
11	*User chooses their desired parking lot*	Given the student picks the location	When they press the location button	They will be looking at availbilty in that particular location.	Pass	The toast message appears					
12	*FSC: Find A Spot will show available parking spots*	Given the student has chosen desired location	When they click on parking spot button	They will see all available parking spots.	Pass						

Testing Plans

Explore



Test Plans Find A Spot

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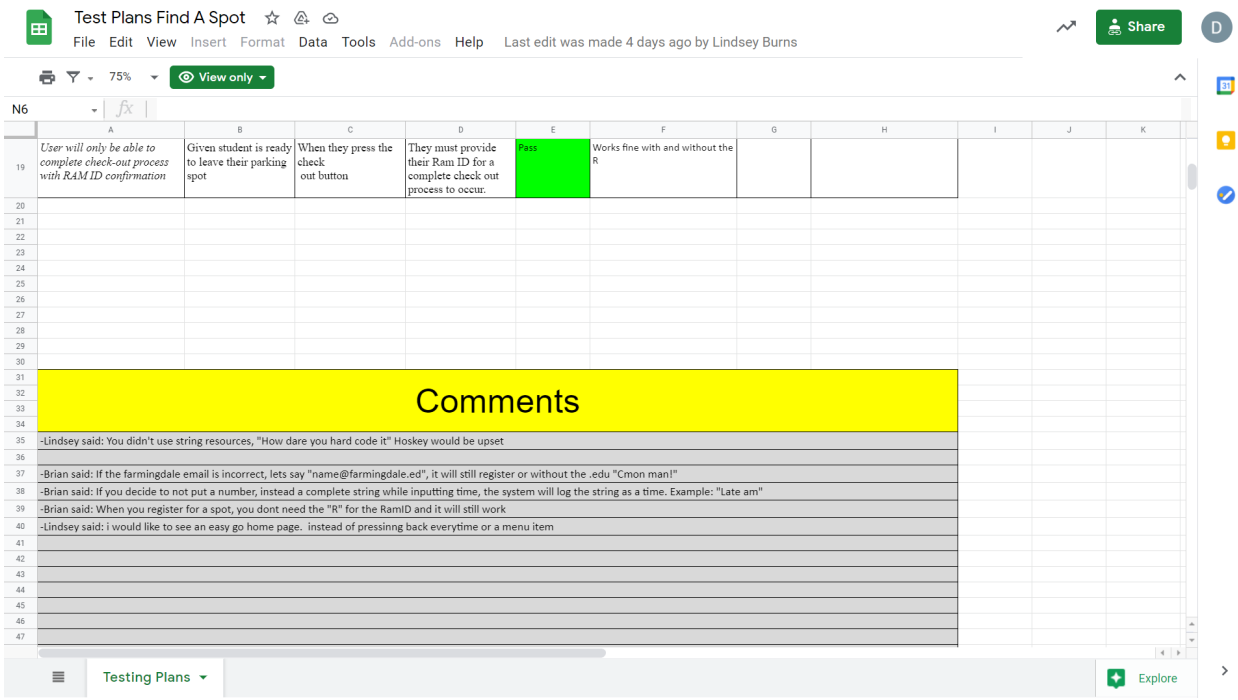
	A	B	C	D	E	F	G	H	I	J	K
11	*User chooses their desired parking lot*	Given the student picks the location	When they press the location button	They will be looking at availbilty in that particular location.	Pass	The toast message appears					
12	*FSC: Find A Spot will show available parking spots*	Given the student has chosen desired location	When they click on parking spot button	They will see all available parking spots.	Pass						
13	*User chooses desired parking spot*	Given the student picks the available spot	When they choose the desired spot	They will be prompted to choose a desired time	Pass	Application will allow user to choose a non numeric time. Ex: Late a.m					
14	*Calendar added to check-in system*	Given the student chose a desired day and time	When they press the pick a spot button	They will see a calendar window	Pass	When choosing a spot we see the calendar, however it never gives us the option to pick a day. Only shows "day off" date					
15	*User can reserve their desired spot with proper requirements*	Given the student picks the desired time, location, and spot	When they click this text box	They will reserve spot with the proper requirements	Pass	It passes with proper requirements, but once again even with some wrong information it still works so needs some polish					
16	*User can check-in*	Given the student has completed the necessary information	When they press the check in button	They will receive a message saying they have been checked in.	Pass	They check in just fine, needs some more code to enhance the fields have the right information it needs					
17	*Unlimited parking time in FSC: Find A Spot*	Given the student picks a spot	When they complete the check in	They will have unlimited time in that desired parking spot	Pass	Doesn't really go anywhere unless you check out of the spot so you can be there as long as you would need to be					
18	*Users can check-out the reserved spot*	Given the student logs in at time of departure	When they press the check out button	They will receive a message saying they have been checked out	Pass	When the time comes and you need to leave you can properly check out					
19	*User will only be able to complete check-out process with RAM ID confirmation*	Given student is ready to leave their parking spot	When they press the check out button	They must provide their Ram ID for a complete check out process to occur.	Pass	Works fine with and without the R					
20											

Testing Plans

Explore



Test Plans Find A Spot

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	A	B	C	D	E	F	G	H
19	*User will only be able to complete check-out process with RAM ID confirmation*	Given student is ready to leave their parking spot	When they press the check out button	They must provide their Ram ID for a complete check out process to occur.	Pass	Works fine with and without the R		

Comments
-Lindsey said: You didn't use string resources, "How dare you hard code it" Hoskey would be upset
-Brian said: If the farmingdale email is incorrect, lets say "name@farmingdale.ed", it will still register or without the .edu "Cmon man!"
-Brian said: If you decide to not put a number, instead a complete string while inputting time, the system will log the string as a time. Example: "Late am"
-Brian said: When you register for a spot, you dont need the "R" for the RamID and it will still work
-Lindsey said: i would like to see an easy go home page. instead of pressinng back everytime or a menu item

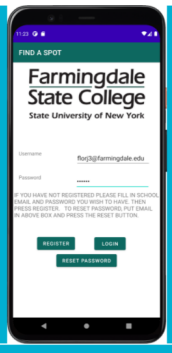
Testing Plans

Explore

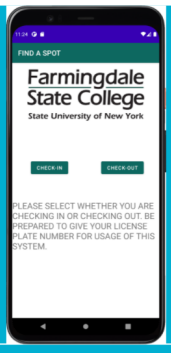
Completed System Images

User Interface

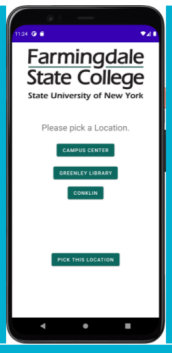
1 Login screen



2 Intro Screen



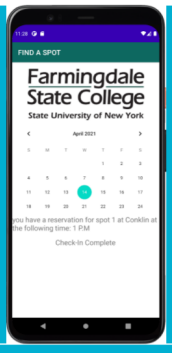
3 Pick a location



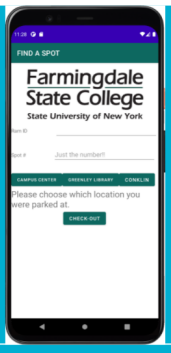
User Interface

4 Pick a spot

5 Check in complete



6 Check out screen



User Interface

7 | Checkout complete