Software Requirements Specification

for

CSUF SWAP Project

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CSUF

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version
Initial Application	N/A	Create initial application for team work on GitHub, and guides for IDE	0.0.1
Pure Application	N/A	Create minimal features such as sign up, sign in, home screen, profile, and sign out.	0.0.2
Structure Database	N/A	Create Release, Request, List Release and Get Request features with firebase connected	0.0.3
Complete Application	N/A	Finish all features, testing and fix issues, and update routes	0.0.4
Optimize Application	N/A	Optimize application and adding themes and release apk version.	1.0.0

1. Introduction

1.1 Purpose

The chaos that occurs in the parking lots every morning of every weekday for the Cal State University of Fullerton (CSUF) community. There are students who have missed a class or even a quiz because of looking for a parking spot. A lot of students are not only stressed about their studies but they are also stressed about the commute which later on may lead to frustration. Furthermore, with the new construction zone at the old Lot E and staff parking, it takes a lot of space. The campus has addressed these issues by providing parking off campus along with its shuttle services, Waze Carpool, Zipcar, and Parking Assistant, but these solutions are not effective in solving the current problem. Given that CSUF continues to sell parking permits despite not having adequate parking spaces available, students are often left searching for extended periods of time. Time is mainly an overlooked aspect of the current solutions that the university is providing.

With this in mind, we propose creating a mobile application that aims to alleviate the problems in finding parking spaces with adequate timing. The CSUF Parking app would function as a real-time database where students can announce via the app that they are leaving. Students that are searching for parking can then communicate with the departing student and arrange for them to take their spot. The app would effectively lower the time students waste looking for parking by providing an interactive student community environment.

1.2 Product Scope

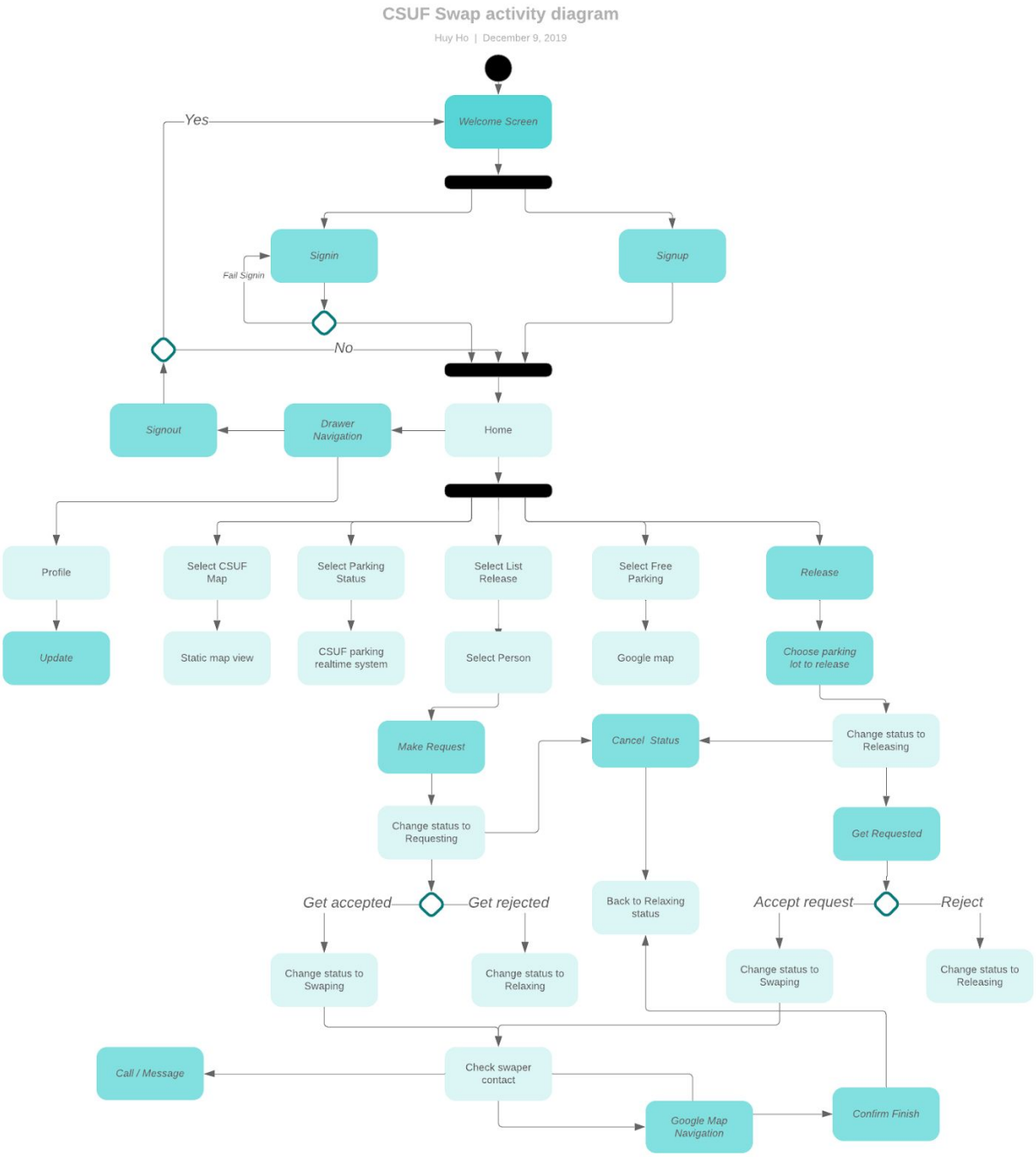
Students who are leaving campus will announce and give parking spots to other students who are looking for a parking spot. This allows for fast, easy, and reliable parking spot transfers. The incentive to use this app is students will no longer have to wander around campus in search of a parking spot. If we have a large user base we can reliably and quickly find our users parking spots within at most minutes from the time they send a request to the time of fulfillment.

This application would potentially lead to an improvement in students:

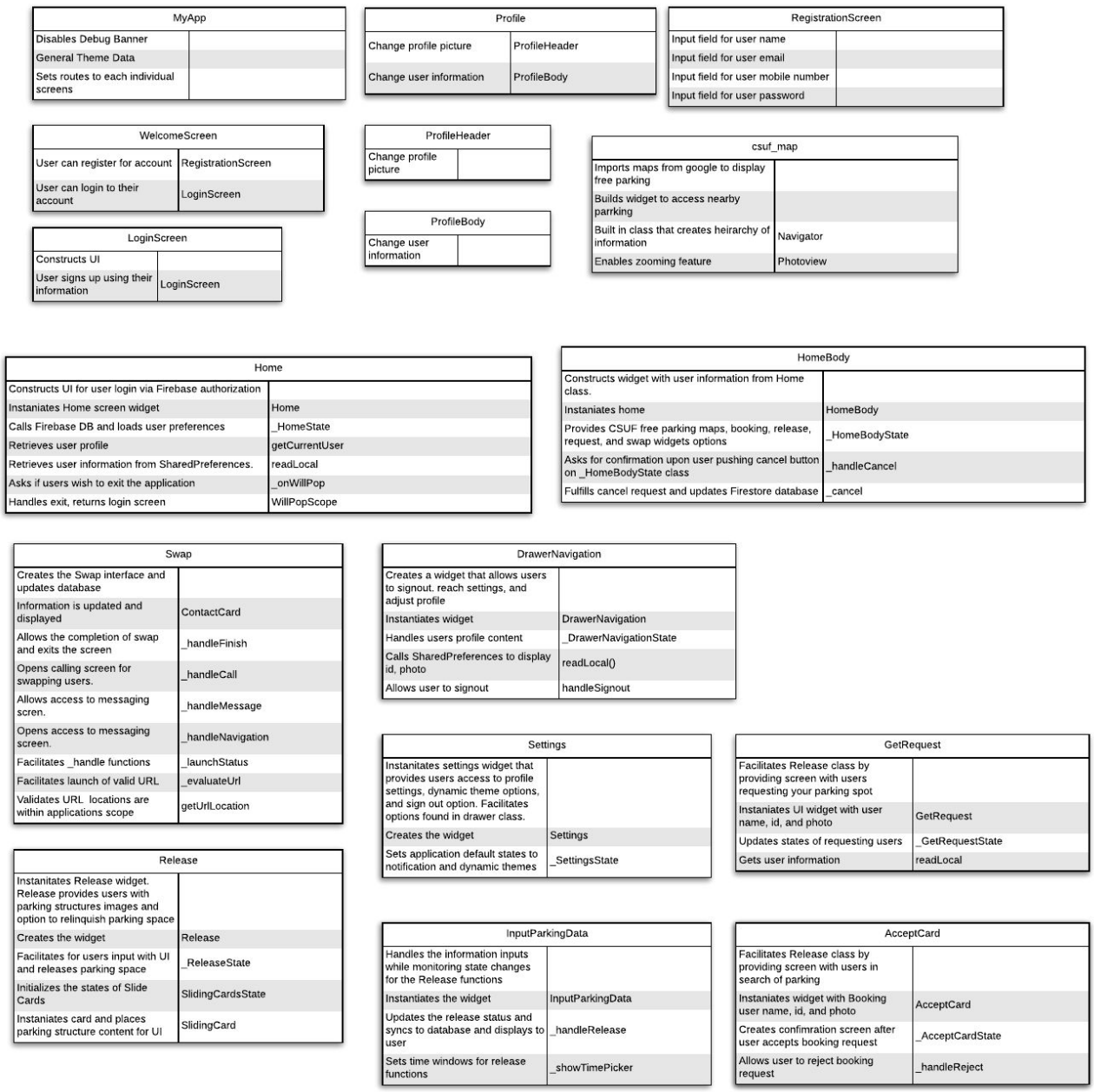
- attendance
- productivity
- morale

Studies show that transportation as a whole has more of an effect on the success of an individual than employment status, secondary education, and drug use. An implementation of this project would put CSUF at the forefront of student success outside the campus environment. This will lead to lasting positive effects by improving a small aspect other campuses rarely think of.

Activity Diagram:



CRC Model:



MyApp	
Disables Debug Banner	
General Theme Data	
Sets routes to each individual screens	

Profile	
Change profile picture	ProfileHeader
Change user information	ProfileBody

RegistrationScreen	
Input field for user name	
Input field for user email	
Input field for user mobile number	
Input field for user password	

WelcomeScreen	
User can register for account	RegistrationScreen
User can login to their account	LoginScreen

ProfileHeader	
Change profile picture	

csuf_map	
Imports maps from google to display free parking	
Builds widget to access nearby parrking	
Built in class that creates heirarchy of information	Navigator
Enables zooming feature	Photoview

LoginScreen	
Constructs UI	
User signs up using their information	LoginScreen

ProfileBody	
Change user information	

Home	
Constructs UI for user login via Firebase authorization	
Instaniates Home screen widget	Home
Calls Firebase DB and loads user preferences	_HomeState
Retrieves user profile	getCurrentUser
Retrieves user information from SharedPreferences.	readLocal
Asks if users wish to exit the application	_onWillPop
Handles exit, returns login screen	WillPopScope

HomeBody	
Constructs widget with user information from Home class.	
Instaniates home	HomeBody
Provides CSUF free parking maps, booking, release, request, and swap widgets options	_HomeBodyState
Asks for confirmation upon user pushing cancel button on _HomeBodyState class	_handleCancel
Fulfills cancel request and updates Firestore database	_cancel

Swap	
Creates the Swap interface and updates database	
Information is updated and displayed	ContactCard
Allows the completion of swap and exits the screen	_handleFinish
Opens calling screen for swapping users.	_handleCall
Allows access to messaging scren.	_handleMessage
Opens access to messaging screen.	_handleNavigation
Facilitates _handle functions	_launchStatus
Facilitates launch of valid URL	_evaluateUrl
Validates URL locations are within applications scope	getUrlLocation

DrawerNavigation	
Creates a widget that allows users to signout. reach settings, and adjust profile	
Instantiates widget	DrawerNavigation
Handles users profile content	_DrawerNavigationState
Calls SharedPreferences to display id, photo	readLocal()
Allows user to signout	handleSignout

Release	
Instanitates Release widget. Release provides users with parking structures images and option to relinquish parking space	
Creates the widget	Release
Facilitates for users input with UI and releases parking space	_ReleaseState
Initializes the states of Slide Cards	SlidingCardsState
Instaniates card and places parking structure content for UI	SlidingCard

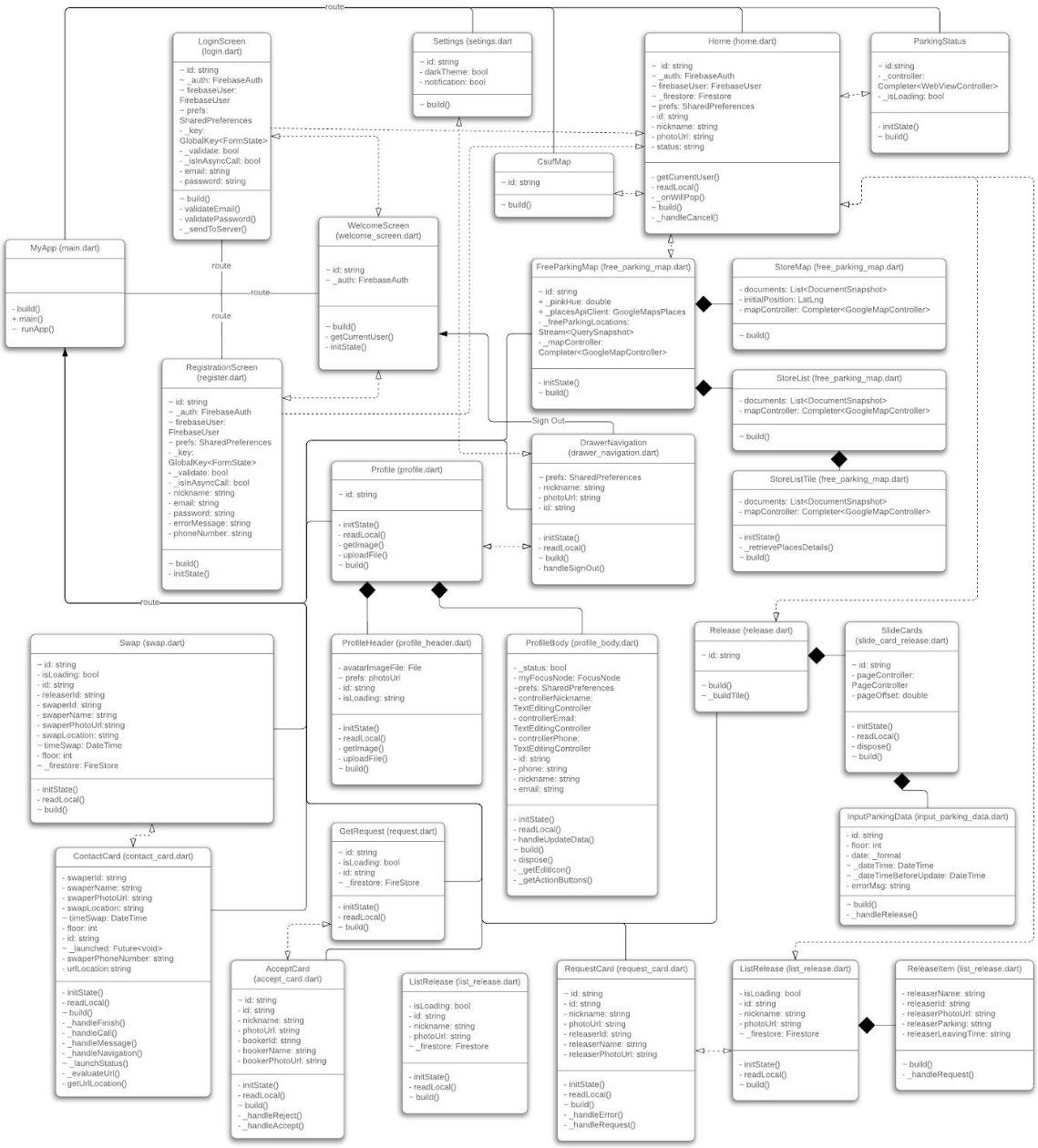
Settings	
Instanitates settings widget that provides users access to profile settings, dynamic theme options, and sign out option. Facilitates options found in drawer class.	
Creates the widget	Settings
Sets application default states to notification and dynamic themes	_SettingsState

GetRequest	
Facilitates Release class by providing screen with users requesting your parking spot	
Instaniates UI widget with user name, id, and photo	GetRequest
Updates states of requesting users	_GetRequestState
Gets user information	readLocal

InputParkingData	
Handles the information inputs while monitoring state changes for the Release functions	
Instantiates the widget	InputParkingData
Updates the release status and syncs to database and displays to user	_handleRelease
Sets time windows for release functions	_showTimePicker

AcceptCard	
Facilitates Release class by providing screen with users in search of parking	
Instaniates widget with Booking user name, id, and photo	AcceptCard
Creates confimration screen after user accepts booking request	_AcceptCardState
Allows user to reject booking request	_handleReject

UML Class Diagram:



2. External Interface Requirements

2.1 User Interfaces

Firstly, the user must register an account with the application in order to use its features. After the first initial registration, the application will auto login the user until the user signs out.

CSUF Swap features that the users may access are:

1. Free Parking Locations
2. Campus Map
3. Parking Structure Information
4. Parking Swap (Parking Structures ONLY)
    a. Release Parking Spot
    b. Request Parking Spot

For the first time after installing the application, the user will be prompted to choose between login and register. Login allows past users to resume using their past account with the application, after entering their email and password. Register will ask users to input their user name, their unique email, their phone number, and their password. The new user will then confirm their registration and be taken to the home page, where login users would be redirected to.

The home page will provide the four features mentioned above:

1. Free Parking Locations provides local park locations that provide free parking and are within 30 minutes walking distance.
2. Campus Map is a static map that is provided by California State Fullerton University.
3. Parking Structure Information is a counter that shows how many parking spots are available at each parking structure.
4. Parking Swap feature can be broken down into two parts and is only currently available for parking structures only.
    a. Release Parking Spot is for users that wish to release their parking spot to another driver.
    b. Request Parking Spot is for users that need to park their car and request for a releaser's parking spot.

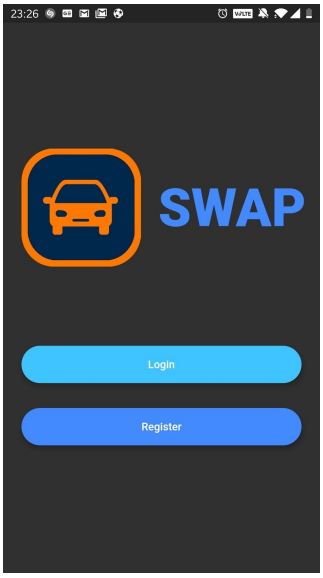
Users have access to change the following profile information from the profile page:

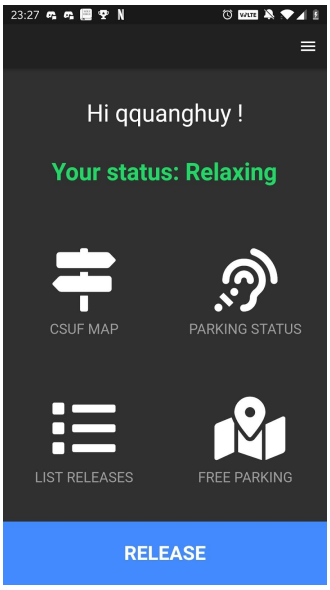
- Username
- Email
- Mobile Phone Number

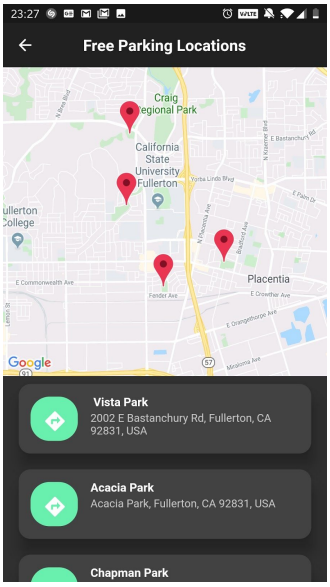
Users may also change the following settings from the settings page:

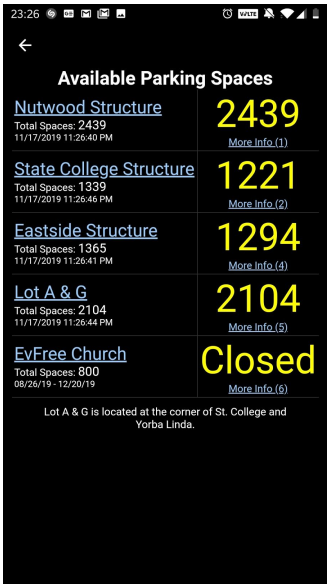
- Phone Notifications
- Dark Theme

Application Screenshots









2.2 Software Interfaces

The mobile application will be able to run on Android platforms.
The application development framework is Flutter.

Dart Packages and Libraries:

- Google Maps Services
- Flutter Material
- Firestore Cloud
- Share Preference
- Firebase firestore
- Animated Text Kit
- Image Picker
- Firebase Authentication

The main program language and code style is Dart.
The Integrated Development Environment are Visual Studio Code and Android Studio.
Operation System Development Environment are Windows, Linux, and MacOS.