Gr8 Parking

# *Requirements Definition*

# 1 Introduction and Context

The purpose of this project is to provide a system in which people can easily find and reserve parking spots for campus events such as sports events. The system will also provide an interface for people to “list” parking on their property for use during the events.

There will be several different interfaces for the different users of the application. Separate views for parking lot owners (including individuals renting just a few spaces on their private property), parking lot attendants, customers, and University personnel.

This will be a web-based application, but it will be built with mobile browser support to allow customers and possibly parking attendants easy use on their smartphones or tablets.

# 2 Users and their Goals

Use case Diagrams are available in the docs folder of the project repository.

# 3 Functional Requirements

1. User authentication and access control.
   1. Users will be required to create an account, registering for the service they would like to use.
      1. Users will create their own username and password; these will be the credentials used to login for subsequent logins.
      2. Usernames and their corresponding passwords will be stored in a database.
   2. Users may have any level of access in the system (customer, parking attendant, parking owner, university staff) or any combination of these privileges.
      1. Users with customer access will have all access to customer features. See FR #3.
      2. Users with parking attendant access will have access to the parking attendant features. See FR #4.
      3. Users with parking owner access will have access to the parking owner features. See FR #5.
      4. Users with university staff access will have access to the university staff features. See FR #6.
      5. Users with Admin access will have access to admin features. See FR #7.
2. User Profile management.
   1. Authenticated users may access and change their own user profile (contact info, password, request access to another level of use).
   2. Authenticated users without admin privileges may not see other user’s profiles.
3. Customer access features.
   1. Customers will have access to an account profile page.
      1. This page will display the customers balance, and funds may be added.
      2. There will be a section where the user can change profile information (Username, Password, etc). This will be common to all users.
   2. Customers will be able to see a list view of dates and events coming up.
   3. After selecting a date/event, available parking will be viewable.
      1. Available parking may be viewed in a list view which may be sorted by price or by distance from the event.
      2. Available parking may be viewed on a map view where icons will indicate where the parking is, where the event is, and the lowest price available at parking locations.
      3. After selecting a parking location, a list of available spots will be given. Spots will be numbered (in sections) starting at 1.
   4. When a parking spot or spots have been selected, the customer will be brought to a confirmation/checkout screen.
      1. Confirmation screen will list selected spots and show the total price.
      2. Checkout will require the license plate number, make, model, and color of the car to be parked (these details may be updated later by the customer in case of changing car).
      3. Afterwards payment will be subtracted from the user’s account balance.
      4. The user will then be provided with a QR code that can be printed or saved to their device. The QR code will be used for check-in at the parking lot/space.
4. Parking Attendant Features.
   1. Parking attendants will have access to a user profile screen where username and password may be viewed and/or updated.
   2. Parking attendants will be primarily responsible for checking customers in at the parking location.
      1. Parking attendants will have a screen with a code input form to check the codes of customers. These will redirect to a page with confirmation info used to check the customer in.
      2. Alternatively, a QR code may be scanned that will redirect to the same confirmation page.
5. Parking Owner Features.
   1. Parking owners will have access to the user profile screen same as other users.
   2. Parking owners will have a page where they can manage their parking location.
      1. Parking owners will be required to add an address for their parking locations. (If it is a lot, there will be directions to the entrance(s)).
      2. A parking owner may add or subtract the amount of available spaces in their lot.
      3. A parking owner may adjust the price of their parking spaces. (Total price will be split 75% / 25% between the parking owner and the University)
      4. A parking owner may have different size spots in different sections. These will be sectioned, and each section will be numbered separately from other sections.
   3. Parking lot owners will have all the privileges of a parking attendant (see FR # 4).
   4. Parking lot owners will be able to appoint and manage other users as parking attendants.
6. University Staff Features.
   1. University staff will be able to add events and locations happening at the university.
   2. University staff may be able to moderate/ authorize parking owners/locations for the events.
7. Administrator features
   1. The admin will be able to view all the users and their info. This can be used in order to help users who forgot usernames or passwords.
   2. Admin will be responsible for keeping the server up to date and running properly.

# 4 Non-functional Requirements

1. React Native will be used as the front-end stack for this project.
2. The map API used will be Google Maps.
3. QR codes will also be created using a Google API.
4. The database after deployment will be able to support practically countless users, but during development will likely be limited to several at a time.

# 5 Future Features

1. Ability to create an account using an existing Google account, rather than just an email address.
2. In the future we will incorporate the ability to use actual money to pay for parking spots. This will include the ability to link credit card or bank accounts to the user’s account.
3. The ability to gift or resell a spot you have purchased to another user.
4. A graphical view of each parking spot available at a lot.

# 6 Glossary

1. Database: A structured set of data held in a computer, especially one that is accessible in various ways.
2. API: A set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other service.
3. Admin: Administrator, a person/account which has permissions to access and change settings within the database.
4. QR Code: A machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information for reading by the camera on a smartphone.