CECS 491A - Sec 6 - Test Plan

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**1. Introduction**

**1.1 In Scope**

**1.1.1:**

Display objects such as Locations, Services and Routes on Interactive Map

**Description:**

A virtual map UI will be implemented showing the map of the campus with all modeled locations and routes on campus as well as the location of the user. The locations that are modeled are classroom buildings, administrative buildings, enrollment services, financial services, the Horn Center, tutoring centers for the various colleges of the university, health services building, physical health services, mental health services, Student Union building, gym, designated recreational areas, restaurants, cafeterias, shops, theaters, auditoriums, arenas, sporting fields, aquatic centers, parking structures, parking lots, water refill stations on campus and drinking fountains, gendered, unisex, and family bathrooms, family rooms, significant landmarks such as statues and water fountains found on campus and all routes and streets within and immediately around the campus. The map may be traversed by being able to scroll through it and zoom it in and out. Modeled Locations on map display info when selected such as hours of operation and location name and the routes always display information showing their foot traffic and denoting the type of transportation allowed on these routes.

**1.1.2:**

Route generation

**Description:**

Generate route from the user's current location to any preferred location through the routes that are modeled on the map when the location is selected anywhere in the app and the route calculates the ETA of routes generated by taking into account foot traffic (which comes from a default model of foot traffic data then later on baseline data gathered from a survey), distance and transportation method.

**1.1.3:**

Show availability in capacity buildings

**Description:**

Shows availability in the three most important capacity buildings on campus that students can utilize: the USU, library, and gym. Availability will be determined through a prediction model based on data that's already available then based on baseline data gathered through user surveys.

**1.1.4:**

Quick Find feature

**Description:**

The Quick Find feature has an alphabetical list of all locations on campus that are modeled on the interactive map for the user to scroll through to find a specific modeled location and a text search function to find a specific modeled location and select it so that the app will highlight the location on the map. Once highlighted on the map the user may select it to generate a route using the route generation function on the interactive map.

**1.1.5:**

User Account System

**Description:**

There will be a user account system in which a user can create an account to log into the app with a distinct username and a password of choice. The user is allowed to change their username if it is a distinct username and they may change their password as well. This user account will be used to track their reward system points and to associate with their schedule of classes.

**1.1.6:**

Schedule Integration

**Description:**

In the schedule integration feature the user can customize their schedule by adding, editing or deleting classes. When creating a class the user must insert the name of the class, the date and time of the class and the building in which the class takes place so that it may be highlighted on the map on the day that the class takes place.

**1.1.7:**

Student Wellness Hub

**Description:**

The Student Wellness hub has three sections to it, the mental health section, the physical health section and the hydration reminder. The mental health section highlights recreational locations for stress relief, psychological services and services for mental disabilities on the map. The physical health section highlights medical service locations, recreational locations for fitness and services for physical disabilities on the map. Recreational time for the improvement of student wellness can be scheduled weekly by the user through setting up reminders. The hydration reminder section takes in the weight of the user to calculate their hydration baseline and allows them to edit the amount of water they will drink during their time on campus. They can customize their reminders by dividing the amount of reminders they want in between the time they are on campus. Once a reminder is sent the nearest water fountain or water refill station will be highlighted on the interactive map.

**1.1.8:**

Reward System

**Description:**

Developers create new weekly locations objectives and random easter eggs which rewards user's with points when they complete the objectives or find the easter eggs. These points can be used to redeem them for prizes which are discounts for use on stores and restaurants on campus.

**1.1.9:**

User Surveys to build baseline data

**Description:**

Users are anonymously surveyed by the application to build baseline data for foot traffic and building capacity. The survey asks the user for their location, whether it be a specific route or one of the three capacity buildings, to state the date and time they visit their location and to rate a route on an incremental level of "Peak Times","Off-Peak Hours","Medium-Peak Hours and to rate a capacity building on a scale of 1-3 to represent completely empty (1), medium filled (2), or completely full (3) based on criteria given to them by the app.

**1.2 Out of Scope**

**1.2.1:**

Branch out the functionality of the application to campuses across the state

**Description:**

At the moment, the application does not account for other campuses within the state of California. Therefore, testing for other campus map UIs will not be necessary.

**1.2.2:**

Live updates of foot traffic and building capacities.

**Description:**

The current application uses data that is retrieved from the users of the application and sets a overall base

**1.2.3:**

Running advertisements for on-campus activities, shops, restaurants, and clubs.

**Description:**

**2. Test Methodology**

**Feature: 1.1.1**

Display Locations and Routes on Interactive Map

**Type of Testing:** API Testing

**Success Scenario:**

* Displays locations and routes on the map.
* Allows the user to move the map UI according to the user’s input/interaction with the device.
* Allow the user to zoom in and/or zoom out of the map UI according to the user’s input/interaction with the device.

**Failure Scenario:**

* Map UI does not display for the user to access or interact with.
* Map UI does not respond to user input/interaction.
* Map UI does not display routes.

**Non Functional Requirement Testing:**

**Success Scenario:**

* Locations and routes displayed within 5 seconds on the application.
* Locations on the application must be readable by any user.
* Access to the locations and routes feature will always be available for the user to access (unless otherwise specified).
* The map has to be responsive to the actions of the users when navigating such as scrolling and zooming in on the map.

**Failure Scenario:**

* Locations and routes are not displayed within 5 seconds.
* Locations on the application are unreadable to the user.
* Users are denied access to locations and routes feature
* The map UI becomes unresponsive to the actions of the user, such as scrolling and zooming in or out of the map

**Feature: 1.1.2**

Route generation

**Type of Testing:** Unit Testing

**Success Scenario:**

* All routes from one location to another on the map are generated for the user to see.
* Routes generated are viable routes that can be taken.

**Failure Scenario:**

* Routes do not generate from one location to another.
* Generated routes are not viable routes that can be taken.

**Non Functional Requirement Testing:**

**Success Scenario:**

* Routes are generated within 5 seconds.
* Viable routes are generated on the application that the user can take.
* The routes have to be responsive to the actions of the users when navigating such as scrolling and zooming in on the map.
* User interaction with routes will yield results.

**Failure Scenario:**

* Routes are not generated within 5 seconds
* Routes generated are not viable to traverse.
* Routes are not responsive to the user’s actions.
* No results when user interacts with routes.

**Feature: 1.1.3**

Show availability in capacity buildings

**Type of Testing:** Integration Testing

**Success Scenario:**

* Availability in capacity buildings is displayed for the user.
* The availability for the capacity building the user wants to examine correctly correlates to that building (i.e. availability for library is displayed for the library only).

**Failure Scenario:**

* Availability is not displayed for capacity buildings.

**Non Functional Requirement Testing:**

**Success Scenario:**

* Availability for capacity buildings loads within 5 seconds.
* Availability range for capacity buildings will be based on maximum capacity of the building itself (this value is determined by the International Building code for each building).
* User interaction with the application will display the appropriate information.

**Failure Scenario:**

* Availability for capacity buildings does not load within 5 seconds.
* Maximum capacity of the capacity building is not correct or does not correlate to the correct capacity building.
* User interaction with the application does not display the appropriate information.

**Feature: 1.1.4**

Quick Find feature

**Type of Testing:** Integration Testing

**Success Scenario:**

* User is able to interact with and type letters into the search bar.
* User is able to see the list of locations found on the map UI that have similar characters to the ones the user entered into the search bar.
* Search bar returns no possible locations if the letters input into the search bar by the user do not match any possible location on the map UI.
* Users are able to interact with a list of locations after entering letters into the search bar.

**Failure Scenario:**

* User cannot interact with or type letters into the search bar.
* User does not see the correct locations found on the map uI that have similar characters to the ones the user entered into the search bar.
* When selecting a location provided by input from the search bar, the location is not correctly displayed on the map UI.

**Non Functional Requirement Testing:**

**Success Scenario:**

* The alphabetical list should load up within 5 seconds when the quick find feature is selected
* When typing up certain characters the quick find feature will pull up locations that match these characters within 5 seconds
* Interaction with Quick Find will allow the user to scroll down the list of options available from keywords input into the search bar

**Failure Scenario:**

* Then the alphabetical list of all modeled locations on the map fails to load within 5 seconds or at all.
* The quick find feature fails to bring up search results within 5 seconds or at all
* The quick find feature becomes unresponsive to the actions of the user not allowing them to scroll through the list of options available or input anything into the search bar

**Feature: 1.1.5**

User Account System

**Type of Testing:** System Test

**Success Scenario:**

* System creates a new user when a unique username and password are inputted in the create account page
* System registers a successful user login when an existing username and corresponding password combination is entered in the login page
* Successful user login allows access to the application and all of its functionalities
* Login page is loaded within five seconds, responds intuitively to user inputs
* User account information, such as the username and password, is kept confidential.
* Users are able to change their username and password for their account as many times as they wish.

**Failure Scenario:**

* System does not create a new user account despite a unique username and password being inputted by the user in the create account page
* System does not allow access to application or it's full functionalities despite the user logging in with an existing username and corresponding password combination entered in the login page
* Login page does not load in a timely manner
* Public user account information is made public
* User's are not able to change their username and password of their account/ any changes made to their username and password is not fully applied to their account

**Non Functional Requirement Testing:**

**Success Scenario:**

* User account system will load within 5 seconds.
* User account information, such as the username and password, is kept confidential.
* Users are able to change their username and password for their account as many times as they wish.
* Actions to either change username or password, and/or logout will happen according to the user.

**Failure Scenario:**

* User account does not load within 5 seconds or at all after logging in
* User account information, such as the username and password, are leaked and lose their confidentiality
* Users are not able to change their username and password or changes to the username and password are not saved.
* App becomes unresponsive to the user when they try to do actions such as changing username or password in the user account feature

**Feature: 1.1.6**

Schedule Integration

**Type of Testing:** Integration Test

**Success Scenario:**

* Users are able to add, edit, and delete classes according to the users interaction/input with the application.
* Schedule is correctly displayed so that the user is able to see when their next class is.
* Class location correctly correlates to building location when displayed on the application.
* Information for classes remains consistent and does not change, unless it is done so by the user.

**Failure Scenario:**

* Users do not have the ability to add, edit, or delete classes based on the user’s interaction/input with the application.
* User’s schedule does not display on the application.
* Class location does not correlate to the building specified to the user’s input.

**Non Functional Requirement Testing:**

**Success Scenario:**

* User schedules load within 5 seconds.
* Users can add as many classes to their schedule as they want.
* Users are not required to have classes in their schedule.
* User’s schedule is kept confidential and is not made public to other users.
* Schedule integration is available for all user accounts.
* Interaction with classes on the schedule will be carried out according to the user’s input.

**Failure Scenario:**

* User schedules do not load within 5 seconds.
* Users are limited to the number of classes they can add to their schedule.
* Users are required to have classes in their schedule.
* User’s schedule is compromised and made available for any person to access/view.
* Schedule integration is not available for some/all accounts.
* Interaction with classes on the schedule do not correlate to what the user input.

**Feature: 1.1.7**

Student Wellness Hub

**Type of Testing:** System Test

**Success Scenario:**

* Allows access to the 3 sections of the Student Wellness hub when selected (Physical Health, Mental Health, Hydration Reminders)
* Selecting the Physical Health section highlights medical service locations, recreational locations for fitness and services for physical disabilities on the map.
* User may create reminders for recreational time within the Physical health section
* Recreational time reminders are successfully sent through email in a timely manner
* Selecting the mental health section highlights recreational locations for stress relief, psychological services and services for mental disabilities on the map.
* Hydration reminder takes in User weight input to calculate a hydration baseline
* Users are able to edit their hydration baseline after it is calculated by the system
* Users are able to customize their reminders by dividing the amount of reminders they want in between the time they are on campus.
* Hydration reminder highlights the nearest water fountain or water refill station on an interactive map.
* Student Wellness Hub and all of its features will load within 5 seconds after interaction.
* All users have access to the Student Wellness Hub.
* All changes made in the student wellness hub such as created reminders are saved.

**Failure Scenario:**

* User is denied access to the Student Wellness Hub
* User is denied access to the three sections of the Student Wellness Hub
* Medical service locations, recreational locations for fitness and services for physical disabilities are not highlighted on the map when the Physical Health section of the Student Wellness Hub is selected.
* Users can not create Recreational time reminders in the Physical Health section
* Recreational Time reminders are not being sent through emails or being sent in a timely manner
* Recreational locations for stress relief, psychological services and services for mental disabilities are not highlighted on the map when the Mental Health Section is selected
* The hydration reminder is not taking in the input by the user and does not properly calculate the hydration baseline
* Users are not able to edit the hydration baseline and saved
* Users can not customize the rate of their hydration reminders
* A hydration reminder does not highlight the nearest water refill station or water fountain on the map to the user
* The student wellness hub and its features do not load in a timely manner.
* users are denied access to the student wellness hub
* All changes made in the student wellness hub such as created reminders are not saved

**Non Functional Requirement Testing:**

**Success Scenario:**

* Student Wellness Hub and all of its features will load within 5 seconds after interaction.
* All users have access to the Student Wellness Hub.
* Interaction with features of the Student Wellness Hub will direct the user to the correct feature.

**Failure Scenario:**

* The Student Wellness Hub and it's features fail to load within 5 seconds or at all after interaction with the feature
* Users are denied access to the Student Wellness Hub and its 3 sections (Mental Health, Physical Health and the hydration hub)
* The app becomes unresponsive to the actions of the user within the Student Wellness Hub

**Feature: 1.1.8**

Reward System

**Type of Testing:** Integration Test

**Success Scenario:**

* The number of points a user has in their account is correct (correctly updates whether it increases or decreases).
* Users are able to interact with and obtain deals/discounts from the rewards section of the application.
* Users can input the code for the scavenger hunt to obtain points.
* Messages for the scavenger hunt are displayed for the user to read.

**Failure Scenario:**

* Points are not (correctly) displayed for the user’s account.
* User cannot interact or obtain deals/discounts.
* User cannot enter a code for the scavenger hunt.
* Message for the scavenger hunt is not displayed for the user.

**Non Functional Requirement Testing:**

**Success Scenario:**

* Rewards feature loads within 5 seconds.
* Users are able to interact and acquire deals on the reward system.
* All deals across all user devices will be the same. Not one device is offered a different or specific deal compared to other users.
* Deals the user acquired will be specific to the user’s account.

**Failure Scenario:**

* Rewards feature does not load within 5 seconds.
* Users are not able to interact and/or acquire deals on the rewards system.
* Deals vary and/or are different for other users' accounts.
* Deals the user acquired not retained/remembered by the account.

**Feature: 1.1.9**

User Surveys to build baseline data

**Type of Testing:** System Test

**Success Scenario:**

* Users are surveyed over the traffic of route locations and the level of fullness in certain capacity buildings
* Surveys submitted by the users are used to gather data and create a data baseline for the routes traffic and the buildings capacity level

**Failure Scenario:**

* Users are denied access to the surveys.
* surveys are not submitted to gather data

**Non Functional Requirement Testing:**

**Success Scenario:**

* Questions regarding availability in capacity buildings will load within 5 seconds of entering said building.
* User responses regarding building capacity are kept confidential and anonymous.
* Users have access to the surveys

**Failure Scenario:**

* Questions regarding the availability in capacity buildings and route traffic fail to load within 5 seconds or at all
* Data regarding the identity of Users taking the surveys are leaked and lose their anonymity
* Users are denied access to the surveys

**3. Test Timeline**

**3.1 Features Tested Bi-Weekly**

* Display Locations and Routes on Interactive Map
* User Account System
* Student Wellness Hub

**3.2 Features Tested Monthly**

* Route generation
* Show availability in capacity buildings
* Quick Find feature
* Schedule Integration
* Reward System
* User Surveys to build baseline data

**4. Test Deliverables**

* Test Plan
* Test Cases

**5. Resource & Environment Needs**

**5.1 Testing Tools**

* Requirements Tracking Tool

**5.2 Test Environment**

* Visual Studio 2019 - Community Edition (Ver. 16.11)
* IIS 10+
* SQL Server Express 2019 (Ver. 15.0. 2000.5)
* Desktop/Laptop