1. Functional Requirements

1.1. Login Feature

1.1.1. Description and Priority

User will login using a Facebook or Google account.

Priority: High

- *Benefit: 9*
- *Cost: 5*
- *Penalty: 5*

1.1.2. Stimulus/Response Sequences

1.1.2.1. *On initial login, user will be prompted to enable location permission (Refer to 1.2 for location permission feature)*

1.1.3. Functional Requirements

1.1.3.1. The user must be able to login with their *Facebook or Google account.*

1.1.3.2. Upon logging in, the application must have a sign out option.

1.2. Request for location permission feature

1.2.1. Description and Priority

User is prompted to allow the system to access their GPS location, via a pop up window.

Priority: Medium

- *Benefit: 9*
- *Cost: 3*
- *Penalty: 5*

1.2.2. Stimulus/Response Sequences

1.2.2.1. *After selecting a permission option, the user will see the <Home Page>.*

1.2.3. Functional Requirements

1.2.3.1. *The application must request for permission before accessing the user's location via GPS.*

1.3.   Full Map Display Feature

1.3.1.   Description and Priority

The feature will display all amenities.

Priority: High

- *Benefit: 9*
- *Cost: 8*
- *Penalty: 9*

1.3.2.   Stimulus/Response Sequences

1.3.2.1.   *After selecting the <View Map> button on the <Home Page> or click the 'Map' icon, the user will see the <Full Map Display Page>.*

1.3.2.2.   *After selecting the relevant filters in the dropdown list, the relevant amenities nearby will be displayed on the <Full Map Display Page>.*

1.3.2.3.   *After searching for specific amenities in the search bar, the map will zoom in to the area with that specific amenity.*

1.3.3.   Functional Requirements

1.3.3.1.   If location permission is enabled, the application will zoom in and display all the amenities near the user.

1.3.3.2.   If location permission is disabled, the application must prompt user to allow location permission once.

1.3.3.3.   If location permission is disabled, the application will display a zoomed-out Singapore map.

1.3.3.4.   The application must allow the user to select amenities to be displayed on the map.

1.3.3.5.   The application must display the names of amenities.

1.3.3.6.   The application must allow the user to search for the names of the specific amenities.

1.4.   Cycling Session Tracking Feature

1.4.1.   Description and Priority

The user will be able to track their cycling sessions using this feature with the start, pause, and stop options.

Priority: High

- *Benefit: 8*
- *Cost: 8*
- *Penalty: 8*

1.4.2. Stimulus/Response Sequence

1.4.2.1. *Upon clicking the 'Start' button on <Start Cycling Page>, the user will be led to the <Live Cycling Progress Page>, where the distance travelled, time taken and average speed of the live cycling session will be displayed live.*

1.4.2.2. *Upon clicking the 'Pause' button, the distance travelled and time taken will be halted.*

1.4.2.3. *Upon clicking the 'Resume' button, the tracking of distance travelled and time taken will continue.*

1.4.2.4. *Upon clicking the 'Stop' button, the user will be led to the <Session Summary Page> where the final distance traveled, time taken and calories burnt will be calculated and displayed.*

1.4.3. Functional Requirements

1.4.3.1.   If location permission is not granted, the application must disable the start cycling session function.

1.4.3.2.   The user must be able to track their current cycling session.

1.4.3.3.   The user must be able to start a cycling session.

1.4.3.4.   The user must be able to pause a cycling session.

1.4.3.5.   The user must be able to resume a paused cycling session.

1.4.3.6.   The user must be able to stop a cycling session.

1.4.3.7.   The application must display the current distance traveled by the user in kilometers, to 2 decimal points of accuracy.

1.4.3.8.   The application must display amenities near the user.

1.4.3.9.   When the user ends the cycling session, the application must display the locations of nearest bicycle racks from the location where the user ends the cycling session.

1.5. Cycling Route Recommendation Feature

1.5.1. Description and Priority

The application will recommend the top few preset cycling routes, sorted based on user ratings.

Priority: High

- *Benefit: 9*
- *Cost: 9*
- *Penalty: 7*

1.5.2. Stimulus/Response Sequences

1.5.2.1. *The user will be able to see a condensed list of top 4 recommended bike routes on the <Home Page>. Upon clicking on the "See all" option, the user will see the <Recommendations Page> with the full list of recommended routes.*

1.5.2.2. *Upon clicking any recommended routes, the user will see the <Start Cycling Page> showing the selected route and amenities along the route.*

1.5.2.3. *Upon clicking the "Stop" button on the <Live Cycling Progress Page>, the user will see the <Session Summary Page>, and will be able to rate the cycling session using a scale of 1 to 5. Upon rating the session, the user will return to the <Cycling History Page>*

1.5.3. Functional Requirements

1.5.3.1. The application must display a list of top 4 recommended preset bicycle routes, sorted based on user ratings.

1.5.3.2. The application must display the user ratings of each cycling route.

1.5.3.3. The user must be able to select a preset cycling route to start a new cycling session on.

1.5.3.4. If a cycling route is selected, the application must navigate to the <Start Cycling Page> and display the suggested route and amenities along the way.

1.5.3.5.　At the end of a cycling session of a preset bicycle route, the user must be able to rate the route out of 5 stars.

1.6.　Cycling History Feature

1.6.1.　Description and Priority

The user is able to track the history of their cycling sessions.

Priority: High

- *Benefit: 9*
- *Cost: 7*
- *Penalty: 7*

1.6.2.　Stimulus/Response Sequences

Upon clicking the 'Cycling History' icon, user will be navigated to the <Cycling History Page>. Upon selecting a particular day, the particular day's distance, average speed will be displayed.

1.6.3.　Functional Requirements

1.6.3.1.　The application must display the details of past cycling sessions.

1.6.3.1.1.　The application must display the distance traveled for each past cycling session in kilometers, to two decimal points of accuracy.

1.6.3.1.2.　The application must display the speed of each past cycling session in kilometers per hour, to two decimal points of accuracy.

1.7. Shared Forum Feature

1.7.1. Description and Priority

The user is able to share messages and connect with like minded individuals through a shared forum.

Priority: Medium

- *Benefit: 4*
- *Penalty: 2*
- *Cost: 3*

1.7.2. Stimulus/Response Sequences

Upon clicking on the 'chat' icon, user will be led to the <Chat Forum Page>. There, the user can see posts made by other users on the forum.

Users can click on the chat box to type and click the 'send' button to post their message.

1.7.3. Functional Requirements

1.7.3.1.   The user must be able to post messages on a shared forum.

1.7.3.1.1.   The application must display the associated user's name on each message.

1.7.3.1.2.   The application must display the time at which each message was sent, in a 24 hour format.

1.8. Weather Forecast Feature

1.8.1. Description and Priority

Using data from the 2h weather forecast, displays Singapore's general weather forecast.

Priority: Low

- *Benefit: 2*
- *Penalty: 2*
- *Cost: 3*

1.8.2. Stimulus/Response Sequences

Upon entering or refreshing the <Home Page>, a weather icon will be displayed based on the current weather forecast.

1.8.3. Functional Requirements

1.8.3.1. The application must be able to display the current weather forecast.

1.9. Set, Edit and Track Goals Feature

1.9.1. Description and Priority

User can input their weekly and monthly goals for the cycling distance.

Priority: Medium

- *Benefit: 4*
- *Penalty: 2*
- *Cost: 3*

1.9.2. Stimulus/Response Sequences

Upon clicking on the 'Edit goal' button on the <Cycling History Page> or the 'View Goals' button on the <Home Page>, the user will be led to the <Goal Tracking Page> where the user can input his monthly and weekly goals and see how much of his monthly cycling distance goal is achieved.

1.9.3. Functional Requirements

1.9.3.1. The application must display the weekly and monthly goal set.

1.9.3.2. The application must allow the user to edit the goal.

2. Nonfunctional Requirements

2.1. Performance Requirements

2.1.1. The application must be compatible with phones running on Android 5.0 and above.

2.1.2. The application must be able to continue a cycling session in the

background.

    2.1.2.1.   The application must be able to track the user's location in the background

    2.1.2.2.   In the case where network connection is lost, the application must be able to continue the cycling session once network connection is up.

        2.1.2.2.1.   The application must automatically pause the cycling session when there is no network connection.

        2.1.2.2.2.   The application must automatically resume the cycling session when network connection is re-established.

  2.1.3.   The application must fetch cycling route data within 2s when the user requests cycling route suggestions.

    2.1.3.1.   If the data fetching fails, the application must retry up to 3 times before displaying an informative error message.

2.2.   Safety Requirements

  2.2.1.   The application must not require user interaction during a cycling session.

2.3.   Security Requirements

  2.3.1.   The application must not access the user's location without their permission.
  2.3.2.   Users should not be able to view other users' cycling sessions.

2.4.   Software Quality Attributes

  2.4.1.   90% of first-time users must be able to start a cycling session within 2 minutes of starting to use the system.

2.5.   Business Rules

  2.5.1.   Each user must provide valid Facebook or Google login credentials to create an account

    2.5.1.1.   An email is considered valid when the user enters the 2-factor authentication code sent to their email into our app.