Use Cases

for

Route Planner

Version 2.0 approved

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Revision History

Name	Date	Reason For Changes	Version
Nadya Yuki Wangsajaya	08/09/2024	First Draft	1.0
Nadya Yuki Wangsajaya	15/09/2024	Second Draft	2.0

Use Case Template

Use Case ID:	LOG1		
Use Case Name:	Login		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	08/09/2024	Date Last Updated:	

Actor:	User
Description:	Returned users must log in to access the application features.
Preconditions:	User has registered for an account previously
Postconditions:	User is logged in
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	1. User fills in their username and password on the registration page 2. The system verifies the User's username and password from the database 3. If the User's username and password are verified, the User is logged in and the system displays the homepage 4. User is able to perform the use case "View Map"
Alternative Flows:	LOG1.AF-S3: If username is not found or incorrect password is entered 1. The system displays, "Incorrect username or password" 2. The system returns to step 1
Exceptions:	LOG1.EX1: If the database is not responding to queries 1. The system displays, "Our system is down at the moment. Please try again in a few minutes." 2. The system returns to step 1
Includes:	NIL
Special Requirements:	1. User must be able to login within 3 seconds
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	LOG2		
Use Case Name:	Register Account		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	08/09/2024	Date Last Updated:	

Actor:	User
Description:	First time users must register for an account by clicking on the button “Register”.
Preconditions:	User should not have been registered previously
Postconditions:	User has successfully created the account and automatically logged in
Priority:	Medium
Frequency of Use:	Low
Flow of Events:	1. User presses the “Register” button on the registration page 2. The system prompts the User to create an account by typing their display name, username, and password 3. User inputs their display name, username, and password, and presses “Register” 4. The system checks if the information submitted is valid and sufficient 5. If the User keys in a valid username and password, the system stores this information into a database 6. User is prompted to log in using the use case “Login”
Alternative Flows:	LOG2.AF-S5: If username is taken by another user 1. The system displays, “Username is already taken. Please user another username” 2. The system returns to step 2 LOG2.AF-S5: If password does not meet the requirements 1. The system displays “Password is not strong enough! Please enter another password. Password must be at least 8 character long.” 2. The system returns to step 2 LOG2.AF-S5: If email address is invalid 1. The system displays “Email address is invalid. Please enter a valid email address.” 2. The system returns to step 2 LOG2.AF-S5: If email address is found in the database 1. The system displays “Email address has already been used. Please log in.” 2. The system returns to step 6

Exceptions:	NIL
Includes:	NIL
Special Requirements:	1. User must be able to create a new account and get logged in within 3 seconds
Assumptions:	1. User agrees to have their data collected and stored 2. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	RH1		
Use Case Name:	View Run History		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	21/09/2024	Date Last Updated:	

Actor:	User, Database
Description:	User is able to view their run history
Preconditions:	User is logged in
Postconditions:	User is displayed a list of post-run summaries from previous runs
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	1. User presses the hamburger button on the top right of the homepage 2. The system gathers post-run summaries of previous runs from the database 3. The system displays the post-run summaries in a list, together with the date when the run is done
Alternative Flows:	NIL
Exceptions:	RH1.EX2: If the database is not responding to User queries 1. The system displays a pop-up with “Sorry, our system is down right now. Please try again later!” 2. User is returned back to the homepage
Includes:	Login
Special Requirements:	1. The run history page must be loaded within 3 seconds
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	VM1		
Use Case Name:	View Map		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	09/09/2024	Date Last Updated:	

Actor:	User, OneMap API
Description:	User is able to see and interact with a map centered around Bishan Area (center of Singapore)
Preconditions:	User is logged in
Postconditions:	The system displays an interactive map centered around the center of Singapore
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system requests OneMap API to generate a map centralized around Bishan area 2. User is able to interact with the map by panning and zooming 3. The system shows “Plan Route” button below the generated map 4. User is able to press the “Plan Route” button and perform the included use case “Plan Route”
Alternative Flows:	NIL
Exceptions:	VM1.EX1: If OneMap API is not responding to queries 1. The system will generate a pop-up, “Sorry, system is currently down. Please try again in a few minutes.” 2. The system prompts User to quit the app
Includes:	Login
Special Requirements:	1. Map must be displayed within 3 seconds 2. The map view must be clear and compatible to a variety of mobile device models and screen sizes 3. The map interface must have appropriate labels 4. The map information must be accurate
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR1		
Use Case Name:	Plan Route		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	08/09/2024	Date Last Updated:	15/09/2024

Actor:	User
Description:	User is able to input the starting point and the running distance and receive route suggestions
Preconditions:	User is logged into Route Planner App
Postconditions:	User is able to view the route chosen
Priority:	High
Frequency of Use:	High
Flow of Events:	1. User presses the “Plan Route” button on the homepage 2. The system takes in User’s starting point and preferred landmark using included use case “Select Start Point” and “Select Landmark” 3. The system generates and displays the route using the included use case “Generate Route” 4. User chooses a route and perform the included use case “Navigate Route”
Alternative Flows:	NIL
Exceptions:	NIL
Includes:	Login Generate Route Select Start Point Select Landmark Navigate Route
Special Requirements:	NIL
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR2		
Use Case Name:	Select Start Point		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	08/09/2024	Date Last Updated:	15/09/2024

Actor:	User, OneMap API
Description:	User is able to select the start point of their run
Preconditions:	User pressed "Plan Route"
Postconditions:	The system gathers the coordinates of the location selected by User
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user can choose the start point by keying in the address or placing a pin on the map 2. If User chooses to input the starting point by typing in the textbox and pressing "Next" button, the system queries OneMap API for the coordinates of the location inputted by User 3. If the input location is valid, the system saves the coordinates as "start point"
Alternative Flows:	PR2.AF-S2/AF-S4: If User chooses to input the starting/end point by placing a pin on the displayed map 1. The system evokes "Pin Location" use case and saves the returned coordinates as "start point" PR2.AF-S3: If the User's inputted location is not found 1. The system queries OneMap API for suggestions of other locations with similar names 2. The system displays these other locations as drop-down options 3. User can choose one of the options, otherwise the system returns to step 1
Exceptions:	PR2.EX1: If OneMap API is not responding to queries 1. The system will generate a pop-up, "Sorry, system is currently down. Please try again in a few minutes." 2. The system prompts User to quit the app
Includes:	Pin Location
Special Requirements:	NIL
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR3		
Use Case Name:	Pin Location		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	15/09/2024	Date Last Updated:	

Actor:	User
Description:	User is prompted on whether to enable live location tracking
Preconditions:	User sees the map
Postconditions:	The system is able to gather the coordinates of the pin
Priority:	High
Frequency of Use:	Medium
Flow of Events:	1. The system gathers User's location using the included use case "Enable Live Location" 2. The pin is initially at the User's current location 3. User is able to interact with the map using the use case "View Map" 4. User selects the starting point pointed by the pin and pressing "Next" button 5. The system queries OneMap API for the coordinates of the pin, and returns the coordinates
Alternative Flows:	NIL
Exceptions:	NIL
Includes:	Enable Live Location
Special Requirements:	NIL
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR4		
Use Case Name:	Enable Live Location		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	08/09/2024	Date Last Updated:	15/09/2024

Actor:	User
Description:	User is prompted on whether to enable live location tracking
Preconditions:	User sees the map
Postconditions:	The system is able to gather User's location
Priority:	High
Frequency of Use:	Medium
Flow of Events:	1. The system displays a pop-up message box prompting the user to enable live location tracking 2. The system will explain the purpose of collecting the location data 3. User chooses to enable live location tracking
Alternative Flows:	PR4.AF-S3: If the User chooses not to enable live location tracking 1. The system returns to step 1
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR5		
Use Case Name:	Select Landmark		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	21/09/2024	Date Last Updated:	

Actor:	User, OneMap API
Description:	User is able to choose their desired landmarks from a drop-down list
Preconditions:	User has chosen the start location and desired distance
Postconditions:	The system gathered coordinates of the chosen landmark
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system queries OneMap API for a list of landmarks within the distance inputted by User 2. The system displays the list of landmarks to User 3. User chooses one of the landmarks 4. The system saves the coordinates of the landmark as "Landmark"
Alternative Flows:	PR5.AF-S1: If there are no suitable landmarks 1. The system saves -1 as the coordinates of the landmark. The landmark is no longer considered during the route generation process PR5.AF-S2: If User chooses NIL in the drop-down list 1. The system saves -1 as the coordinates of the landmark. The landmark is no longer considered during the route generation process
Exceptions:	PR5.EX1: If OneMap API is not responding to queries 1. The system will generate a pop-up, "Sorry, system is currently down. Please try again in a few minutes." 2. The system prompts User to quit the app
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR6		
Use Case Name:	Generate Route		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	09/09/2024	Date Last Updated:	

Actor:	OneMap API
Description:	The system generates a route from the selected start point that passes through the selected landmark
Preconditions:	The system has gathered User's start point, distance, and chosen landmark
Postconditions:	Three route is generated, each with their sheltered version
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system queries OneMap API for possible routes from start point that pass through the selected landmark (if any), with the desired distance 2. If there are more than 3 possible routes, the system randomly chooses 3 routes with different distances 3. The system generates an alternative sheltered route using the included use case "Generate Sheltered Route" 4. The system gathers weather information using the included use case "Access Weather Information" 5. If the weather is bad, the system displays the alternative sheltered routes first 6. If the weather is fair, the system displays the default unsheltered routes first
Alternative Flows:	PR6.AF-S1: If the landmark coordinates is -1 1. The system no longer consider landmarks as a part of route generation. 2. The system generates possible routes from start point and distance only 3. The system returns to step 2 PR6.AF-S2: If there are less or equal than 3 routes 1. The system returns to step 3
Exceptions:	PR6.EX1: If OneMap API is not responding to queries 3. The system will generate a pop-up, "Sorry, system is currently down. Please try again in a few minutes." 4. The system prompts User to quit the app
Includes:	Generate Sheltered Route Access Weather Information
Special Requirements:	1. More than 95% of users should be able to complete the route generation and selection process within 2 minutes

	2. Each unique route generated must be traced with different colours 3. The routes must be generated within 5 seconds 4. The routes must only run through accessible paths 5. The generated route must be within 5% of user's chosen distance
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR7		
Use Case Name:	Generate Sheltered Route		
Created By:	Huang Yongjian	Last Updated By:	
Date Created:	09/09/2024	Date Last Updated:	

Actor:	OneMap API
Description:	The system generates a route that prioritises usage of sheltered linkway
Preconditions:	The user chose to generate the route with the specified starting and end point and landmarks (if any)
Postconditions:	A sheltered route between starting and end point will be generated.
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system queries OneMap API for the routes from start and end point that pass through the selected landmark (if any) 2. The system queries its database to retrieve the sheltered linkway dataset and overlay onto the route generated 3. The system will choose the route with the most overlap with the sheltered linkway locations 4. The system will use heuristic search strategies to identify the nearest shelter for each of the unsheltered portions of the route and redirect the route to prioritise sheltered linkway usage
Alternative Flows:	PR7.AF-S4: If the nearest shelter that fulfills the defined heuristic function does not exist, the unsheltered portion will be retained in the route.
Exceptions:	PR7.EX1: If OneMap API is not responding to queries 1. The system will generate a pop-up, “Sorry, system is currently down. Please try again in a few minutes.” 2. The system prompts User to quit the app PR7.EX2: If the database is not responding to queries 1. The system will generate a pop-up, “Sorry, system is currently down. Please try again in a few minutes.” 2. The system prompts User to quit the app
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR8		
Use Case Name:	Access Weather Information		
Created By:	Nadya Yuki	Last Updated By:	
Date Created:	09/09/2024	Date Last Updated:	

Actor:	Weather API
Description:	The system queries the weather forecast for route generation purposes
Preconditions:	The three routes and their sheltered version have been generated
Postconditions:	The system gathered the weather forecast
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system queries the Weather API for the weather forecast in the next hour in the perimeter of the start and end point 2. The system categorises the weather forecast as “fair” or “bad” (the latter means raining / too hot)
Alternative Flows:	NIL
Exceptions:	PR8.EX1: If Weather API is not responding to queries 1. The system displays “Current weather is unavailable” 2. The system returns the default fair weather
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	NR1		
Use Case Name:	Navigate Route		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	08/09/2024	Date Last Updated:	15/09/2024

Actor:	User, OneMap API
Description:	User is able to navigate the route via a small cursor overlayed on a map
Preconditions:	User has chosen a route
Postconditions:	Post-run summary is displayed to User
Priority:	High
Frequency of Use:	High
Flow of Events:	1. User presses the "Start run" button 2. User is able to view and interact with the map with the chosen route highlighted 3. If User's location is enabled and User starts to run, the system queries continuously queries OneMap API for the User's real-time location 4. The system displays the User's location as a cursor on the map 5. The system displays the distance, time, and pace of User 6. Once the User reaches endpoint, or stopped running, the user presses "End Run" button 7. The system will display a pop-up to confirm if the user wants to end the run. 8. If the User clicks "Yes" button, the system displays the post-run summary using the included use case "Generate Post-run Summary"
Alternative Flows:	RN1.AF-S3: If User's location is not enabled 1. The system will explain that the start run feature is only accessible if the app has permission to the User's location 2. The system will prompt the user to provide location access using the included use case "Enable Live Location" 3. The system returns to step 3 RN2.AF-S2: If the User clicks "No" button 1. The system returns to step 3
Exceptions:	RN1.EX1: If OneMap API is not responding to queries 1. The system will generate a pop-up, "Sorry, system is currently down. Please try again in a few minutes." 2. The system prompts User to quit the app
Includes:	Enable Live Location Generate Post-run Summary

Special Requirements:	1. The cursor must follow the User in real-time 2. The cursor's location and User's actual location must be within 5%
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	RN2		
Use Case Name:	Generate Post-run Summary		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	08/09/2024	Date Last Updated:	15/09/2024

Actor:	User
Description:	User is able to view the post-run summary, which includes the time taken, distance ran, average pace, and a map showing the path taken during the run
Preconditions:	The system has gathered the end point location
Postconditions:	The system displays the post-run summary
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system calculates the total time taken to run in HH:MM:SS format 2. The system generates a map of the route taken by User, from the start point to the current location 3. The system calculates the distance covered by User 4. The system generates a post-run summary containing the details in step 1 to 3
Alternative Flows:	NIL
Exceptions:	NIL
Includes:	NIL
Special Requirements:	1. The post run summary must be generated within 3 seconds
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:			
Use Case Name:			
Created By:		Last Updated By:	
Date Created:		Date Last Updated:	

Actor:	
Description:	
Preconditions:	
Postconditions:	
Priority:	
Frequency of Use:	
Flow of Events:	
Alternative Flows:	
Exceptions:	
Includes:	
Special Requirements:	
Assumptions:	
Notes and Issues:	