Use Cases

for

Route Planner

Version 5.0 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
Huang Yongjian	29/10/2024	Third Draft	3.0
Huang Yongjian	06/11/2024	Fourth Draft	4.0

Nadya Yuki Wangsajaya	16/11/2024	Fifth Draft	5.0

Use Case Template

Use Case ID:	LOG1		
Use Case Name:	Login		
Created By:	Nadya Yuki	Last Updated By:	Huang Yongjian
Date Created:	08/09/2024	Date Last Updated:	29/10/2024

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 and presses “Sign in” button 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 password is empty 1. The system displays login error “Password should not be empty” 2. The system returns to step 1 LOG1.AF-S3: If username is empty 1. The system displays login error “Username should not be empty” 2. The system returns to step 1 LOG1.AF-S3: If username is not found or incorrect password is entered 1. The system displays login error “Incorrect credentials” 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:	Huang Yongjian
Date Created:	08/09/2024	Date Last Updated:	29/10/2024

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 and displays success message “Registration successful. Please log in.” 6. User is prompted to log in using the use case “Login”
Alternative Flows:	LOG2.AF-S5: If display name is empty 1. The system displays registration error “Name should not be empty” 2. The system returns to step 2 LOG2.AF-S5: If username is empty 1. The system displays registration error “Username should not be empty” 2. The system returns to step 2 LOG2.AF-S5: If password does not meet the requirements 1. The system displays registration error “Password must be longer than or equal to 8 characters.” 2. The system returns to step 2 LOG2.AF-S5: If username is taken by another user 1. The system displays registration error “Username already exists” 2. The system returns to step 2

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
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.EX1: If the database is not responding to user's query 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:	Huang Yongjian
Date Created:	09/09/2024	Date Last Updated:	06/11/2024

Actor:	User, Google Map API
Description:	User is able to see and interact with a map centered around the user's live location/default location
Preconditions:	User is logged in
Postconditions:	The system displays an interactive map centered around the center of the user's live location/default location
Priority:	High
Frequency of Use:	High
Flow of Events:	1. User logs in using included use case "Login" 2. The system prompts the user for live location tracking using included use case "Enable Live Location" 3. If location access is provided, the system requests Google Map API to generate a map centralized around the user's live location 4. User can interact with the map by panning and zooming 5. The system shows "Plan Route" button below the generated map 6. User can press the "Plan Route" button and perform the included use case "Plan Route"
Alternative Flows:	VM1.AF-S3: If live location is not given 1. An error message is displayed 2. The system returns to step 2
Exceptions:	VM1.EX1: If Google Map 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 Enable Live Location
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:	ELL1		
Use Case Name:	Enable Live Location		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	08/09/2024	Date Last Updated:	16/11/2024

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 shows an alert that prompts the user to turn on live location tracking in settings
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR1		
Use Case Name:	Plan Route		
Created By:	Nadya Yuki	Last Updated By:	Huang Yongjian
Date Created:	08/09/2024	Date Last Updated:	29/10/2024

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 logs in using included use case “Login” 2. The system prompts the user for live location tracking using included use case “Enable Live Location” 3. User presses the “Plan Route” button on the homepage 4. The system takes in User’s starting point, desired distance and preferred landmark using included use case “Select Start Point”, “Select Distance” and “Select Landmark” 5. The system generates and displays the route using the included use case “Generate Route” 6. User chooses a route and perform the included use case “Navigate Route”
Alternative Flows:	NIL
Exceptions:	NIL
Includes:	Login Enable Live Location Select Start Point Select Distance Select Landmark Generate Route/Generate Sheltered Route 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:	16/11/2024

Actor:	User, Google Map API, HERE API
Description:	User is able to select the start point of their run
Preconditions:	User pressed "Plan Route" on the homepage
Postconditions:	The system gathers the coordinates of the location selected by User
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system requests for the weather condition of current map location for display using the included use case "Access Weather Information" 2. The user can choose the start point by keying in the address. As user types, there will be suggestions generated by querying HERE API 3. When a start point is selected, the system queries Google Map API for the coordinates of the location inputted by User and pans the map to the selected location 4. The system requests for the weather condition of selected start point location for display using the included use case "Access Weather Information" 5. If the weather indicates that it is raining, the system toggles the "Look for sheltered route" on by default 6. The user is also able to toggle on/off for "Look for sheltered route" 7. After the user presses "Next" button, if the input location is valid, the system saves the input coordinates as "start point"
Alternative Flows:	PR2.AF-S5: If the weather indicates that it is not raining 1. The system toggles the "Look for sheltered route" off by default 2. The system continues to step 6 PR2.AF-S7: If the User's inputted location is not found 1. The system shows "Geocode Error: Location not found" 2. The system returns to step 1 PR2.AF-S7: If the user leaves the textbox empty, 1. The system saves the coordinates of the user's current location as "start point"

Exceptions:	PR2.EX1: If Google Map 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:	Access Weather Information
Special Requirements:	NIL
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	AW1		
Use Case Name:	Access Weather Information		
Created By:	Nadya Yuki	Last Updated By:	Nadya Yuki
Date Created:	09/09/2024	Date Last Updated:	16/11/2024

Actor:	Weather API
Description:	The system queries the current weather for the current map location
Preconditions:	User is logged in
Postconditions:	The system gathers the current weather of map location for display
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system queries the Weather API for the current weather condition in the specified location coordinates 2. The system displays the queried weather forecast
Alternative Flows:	NIL
Exceptions:	AW1.EX1: If Weather API is not responding to queries 1. The system displays “Unknown N/A”
Includes:	Login
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:	Select Distance		
Created By:	Huang Yongjian	Last Updated By:	-
Date Created:	29/10/2024	Date Last Updated:	-

Actor:	User
Description:	User is able to key in total run distance
Preconditions:	User pressed “Next” on Select Start Point page
Postconditions:	The system gathers the desired distance selected by User
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The user keys in the desired run distance 2. The user is also able to toggle on/off for “Look for sheltered route” 3. After typing in the textbox and pressing “Next” button, the system saves the run distance for further processing.
Alternative Flows:	PR3.AF-S3: If the User keys desired distance in invalid format (i.e. not numeric or not between 1 – 30 km) 1. The system prompts user about invalid input format and returns to step 1
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR4		
Use Case Name:	Select Landmark		
Created By:	Nadya Yuki	Last Updated By:	Huang Yongjian
Date Created:	21/09/2024	Date Last Updated:	29/10/2024

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 half of the desired distance away from the start point 2. The system displays the list of landmarks to User 3. User chooses one of the landmarks 4. The user is also able to toggle on/off for "Look for sheltered route" 5. After selecting the "Next" button, the system saves the coordinates of the chosen landmark as "Landmark"
Alternative Flows:	PR4.AF-S1: If there are no nearby landmarks 1. The system saves NULL as the coordinates of the landmark. The landmark is no longer considered during the route generation process PR4.AF-S5: If User chooses "None" in the drop-down list and presses the "Next" button 1. The system saves NULL as the coordinates of the landmark. The landmark is no longer considered during the route generation process
Exceptions:	PR4.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:	PR5		
Use Case Name:	Generate Route		
Created By:	Nadya Yuki	Last Updated By:	Huang Yongjian
Date Created:	09/09/2024	Date Last Updated:	29/10/2024

Actor:	User, GraphHopper API
Description:	The system generates a route from the selected start point that passes through the selected landmark (if any)
Preconditions:	The system has gathered User's start point, desired distance, and chosen landmark (if any)
Postconditions:	Three routes are generated, sheltered routes are not prioritised
Priority:	High
Frequency of Use:	High
Flow of Events:	1. If the toggle "Look for sheltered route" is off, the system queries GraphHopper API for 3 possible routes with the desired running distance, prioritising the passing through of the selected landmark (if any) 2. The user is able to view and toggle between the 3 route, as well as to see the total distance of each route. 3. When the user presses "Select Route", the chosen route will be saved for navigation purposes.
Alternative Flows:	PR5.AF-S1: If the toggle "Look for sheltered route" is on 1. The system generates shelter-optimised route using extended use case "Generate Sheltered Route"
Exceptions:	PR5.EX1: If GraphHopper 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:	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 to indicate the start and return portion of the route 3. The routes must be generated within 5 seconds 4. The generated route must be within 500m of user's chosen distance
Assumptions:	1. User is connected to the Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	PR6		
Use Case Name:	Generate Sheltered Route		
Created By:	Huang Yongjian	Last Updated By:	Huang Yongjian
Date Created:	09/09/2024	Date Last Updated:	29/10/2024

Actor:	User, GraphHopper API
Description:	The system generates three routes that prioritise the usage of sheltered linkway
Preconditions:	The user chose to generate the route with the specified start point and landmarks (if any)
Postconditions:	Three routes are generated, sheltered routes are prioritised
Priority:	High
Frequency of Use:	High
Flow of Events:	1. The system queries the database to retrieve the nearby shelters from the start point 2. The system queries GraphHopper API for 3 possible routes with the desired running distance, prioritising the passing through of the queried nearby shelter segments from the start point as well as the selected landmark (if any) 3. The user is able to view and toggle between the 3 route, as well as to see the total distance of each route. 4. When the user presses “Select Route”, the chosen route will be saved for navigation purposes.
Alternative Flows:	NIL
Exceptions:	PR6.EX1: If GraphHopper 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 PR6.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:	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 to indicate the sheltered, start and return portion of the route 3. The routes must be generated within 5 seconds 4. 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:	NR1		
Use Case Name:	Navigate Route		
Created By:	Nadya Yuki	Last Updated By:	Huang Yongjian
Date Created:	08/09/2024	Date Last Updated:	29/10/2024

Actor:	User, Google Map 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 "Select Route" 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 continuously queries Google Map 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 will store the run data (image of route taken by user, running distance, time and pace) and displays the post-run summary using the included use case "Generate Post-run Summary"
Alternative Flows:	NR1.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 NR1.AF-S2: If the User clicks "No" button 1. The system returns to step 3
Exceptions:	NR1.EX1: If Google Map 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 NR1.EX2: 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:	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 10m
Assumptions:	1. User is connected to Internet
Notes and Issues:	NIL

Use Case Template

Use Case ID:	NR2		
Use Case Name:	Generate Post-run Summary		
Created By:	Nadya Yuki	Last Updated By:	Huang Yongjian
Date Created:	08/09/2024	Date Last Updated:	29/10/2024

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 generates a map of the route taken by User, from the start point to the current location 2. The system stores the total time taken to run in MM:SS format, the total distance covered by User in km, and the pace of the run in MM:SS format 3. The system generates a post-run summary containing the details in step 1 to 2
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