Use Cases

for

ParkSmart

Version 1.2 approved

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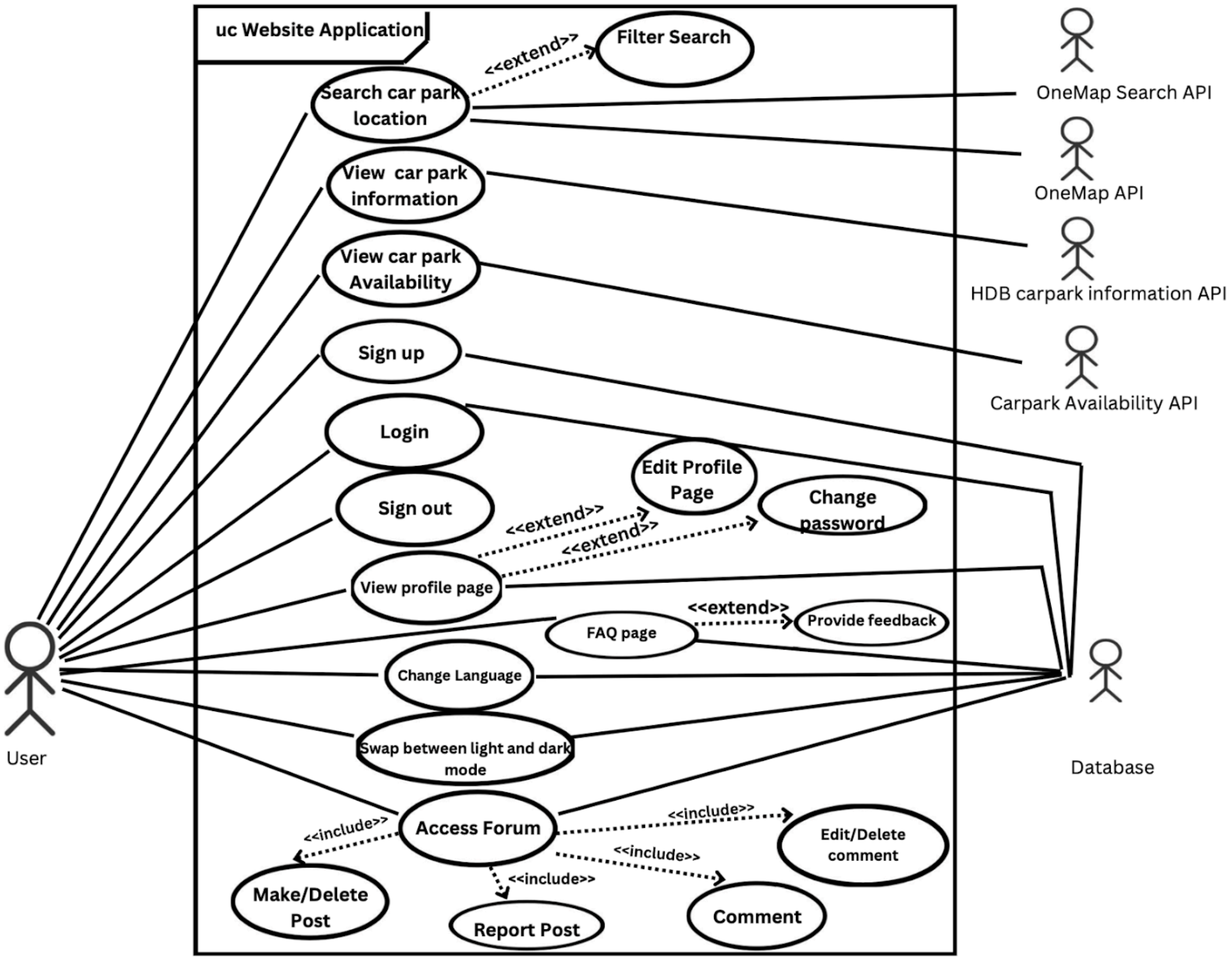
Revision History

Name	Date	Reason For Changes	Version
Bradley, Wen Rong	05/02/2025	Use Cases for Initial Requirements	1.0
Brandon, Wen Rong, Qi Cheng, Bradley, Jia Yuun, Aditi	19/02/2025	Adding more functional and non-functional requirements and their use cases	1.1
Wen Rong	06/04/2025	Final updates to all documentations.	1.2

USE CASE DIAGRAM



USE CASE DESCRIPTIONS

Use Case Name	Sign up
Actor:	User, Database
Description:	Allow new users to create an account
Preconditions:	User does not have an existing account
Postconditions:	New user account created
Flow of Events:	S1: User opens web app without being signed in S2: User is brought to login page S3: User clicks on “Sign up” button and is redirected to sign-up page S4: User enters relevant details (full name, email, userID, phone number, car plate number) with the correct formats S5: User clicks “Create Account” and system stores new user information in the database S6: User is redirected to home page
Alternative Flows:	AF-S4: Invalid Input AF-S4-1: Username already registered 1. App displays a cross “X” next to failed requirement 2. App remains at step S4 until requirements are met AF-S4-2: Password strength error 1. App displays “Please match the requested format.” message

	2. App remains at step S4 until requirements are met AF-S4-3: Email format wrong 1. App displays “Please include an ‘@’ in the email address. ‘(email)’ is missing an ‘@’ 2. App remains at step S4 until requirements are met AF-S5: Email already registered 1. App displays “Email already in use.” message 2. App returns to step S2
Exceptions:	EX1: Database is inaccessible EX2: Network error 1. App displays “Error. Not connected to the internet.”

Use Case Name	Login
Actor:	User, Database
Description:	Allow user to log in
Preconditions:	User has an existing account User has not logged in on device before
Postconditions:	User is logged in and authenticated
Flow of Events:	S1: User opens web app S2: User is brought to login page S3: User enters email/password

	S4: Authentication System hashes password and verifies login details with database S5: User is logged in successfully S6: User enters main page
Alternative Flows:	AF-S5-1: Login fails as password is invalid 1. App displays "Credentials are incorrect. Please try again." message 2. Password field is emptied AF-S5-2: Login fails as email is invalid 1. App displays "Credentials are incorrect. Please try again." message 2. Password field is emptied
Exceptions:	EX1: Authentication System/ Database is inaccessible EX2: Network error 1. App displays "Error. Not connected to the internet."

Use Case Name:	Sign Out
Actor:	User
Description:	Allow user to log out of the app
Preconditions:	User is logged in and authenticated User is on the main page
Postconditions:	User is logged out and return to the login page

Flow of Events:	S1: User taps the “Sign Out” button S2: App clears user session data S3: User is signed out and redirected to the login page
Exceptions:	EX1: Sign-out fails due to a system error 1. App displays “There was an error signing you out. Please try again later.” message

Use Case Name	View Profile Page
Actor:	User, Database
Description:	Allow users to view their profile information
Preconditions:	User is on web app
Postconditions:	User can view and update their profile information
Flow of Events:	S1: User selects the “Profile” option from the navigation bar S2: If logged-in, app retrieves the user’s profile data from the database S3: App displays the user’s profile information including email, username, vehicle number plate, and other relevant details
Alternative Flows:	AF-S2: User is not logged-in 1. App is redirected to Login page
Exceptions:	EX1: Database error

	1. App displays “There was an error retrieving your profile. Please try again later.”

Use Case Name	Edit Profile Page
Actor:	User, Database
Description:	Extends View Profile Page by allowing user to change profile details
Preconditions:	User is logged in and on the profile page
Postconditions:	User profile information is updated
Flow of Events:	S1: App displays the user’s profile information including email, username, vehicle number plate, and other relevant details S2: User can edit their details such as email, password, name or vehicle number plate S3: User confirms changes and authentication system updates the database S4: Profile page is updated
Alternative Flows:	AF-S3: User cancels profile updates 1. App returns to the Profile Page without saving any changes
Exceptions:	EX1: Profile update fails due to system error 1. App displays “There was an error updating your profile. Please try again later.”

Use Case Name	Change Password
Actor:	User, Database
Description:	Extends View Profile Page by allowing user to change password
Preconditions:	User has an existing account and is on Profile Page
Postconditions:	User password is changed
Flow of Events:	S1: User clicks on “Change Password” S2: App requests user to enter existing password and new password S3: If no problems password is changed S4: App updates the database
Alternative Flows:	AF-S3-1: Current Password is wrong 1. App displays window “Failed to update password. Please try again. Error: Old password is incorrect.” message 2. App remains at step S2 until requirements are met AF-S3-2: New Password does not meet requirements 1. App displays “Please match the requested format.” message 2. App remains at step S2 until requirements are met
Exceptions:	EX1: Authentication System/ Database is inaccessible EX2: Network error 1. App displays “Error. Not connected to the internet.”

Use Case Name	Search car park location
Actor:	User, OneMap API, OneMap Search API
Description:	Allow users to search for specific car park locations
Preconditions:	User is on the searchpage
Postconditions:	User is presented with search results for car park locations
Flow of Events:	S1: App asks user for location permission S2: App shows top 10 carparks nearby to user's location S3: User enters new address into search to find nearby carparks to new address S4: User can click on any car park in the list for more detailed information (see "View Car Park Informartion" use case)
Alternative Flows:	AF-S2-1: Location permission not granted 1. No available carparks are shown AF-S2-2: User adjusts slider to show up to 100 carparks 2. Number of carparks shown changes accordingly
Exceptions:	EX1: API rate limit exceeded. 1. App displays "There was an overload of requests. Please try again later." EX2: Network error 1. App displays "Error. Not connected to the internet."

Use Case Name	Filter Search
Actor:	User, OneMap API, OneMap Search API
Description:	Extends search by allowing users to filter by “Free Parking”, “Night Parking”, “Availability”, “Height Restrictions”
Preconditions:	User is on the searchpage
Postconditions:	User is presented with filtered search results for car parks
Flow of Events:	S1: User enters address and applies filters S2: App displays a list of car parks that are nearby and match the filters, including their names and general location information S3: User can click on any car park in the list for more detailed information
Alternative Flows:	AF-S2-1: User adjusts slider to show up to 100 carparks 1. Number of carparks shown changes accordingly
Exceptions:	EX1: API rate limit exceeded. 1. App displays “There was an overload of requests. Please try again later.” EX2: Network error App displays “Error. Not connected to the internet.”

Use Case Name	View Car Park Information

Actor:	User, HDB Carpark Information API
Description:	Allow users to view information about HDB car parks (address, number of spots available, operating hours, multi-storey, height limit, basement, night parking, free parking, etc).
Preconditions:	User is on the searchpage
Postconditions:	User views the real-time availability and information of parking lots
Flow of Events:	S1: User selects a car park from the list and clicks “View Details” S2: App retrieves real-time parking availability for the selected car park S3: App displays the parking lot details, including address, rates, operating hours, gantry height, and payment methods and more
Exceptions:	EX1: Network error App displays “Error. Not connected to the internet.”

Use Case Name	View Car Park Availability
Actor:	User, Carpark Availability API
Description:	Allow users to view real-time availability of car parks
Preconditions:	User is on the searchpage and has available parking lots nearby shown
Postconditions:	User views the real-time availability of parking lots

Flow of Events:	S1: Real-time availability of car parks shown for all listed available parking lots shown (after searching/filtering is done)
Exceptions:	EX1: Real-time data retrieval fails 1. App displays “Unable to retrieve parking availability. Please try again later.” EX2: Network error App displays “Error. Not connected to the internet.”

Use Case Name	FAQ Page
Actor:	User, Database
Description:	Allows users to provide feedback on their experience with the app
Preconditions:	User is on web app
Postconditions:	User obtains ParkSmart contact information, sees frequently asked questions (FAQs) and can submit feedback (“Feedback” use case)
Flow of Events:	S1: User clicks “Support” in navigation bar S2: User is brought to support page and can email developers and see a list of FAQs
Alternative Flows:	AF-S2: If user is logged in and is an admin 1. Admin is redirected to admin dashboard 2. Feedback and reports are fetched by the system from the database 3. Admin can see feedback, average rating and reports

	4. Admin can review reports and navigate directly to the post page where the reported post or comment is found 5. Admin can delete reported posts or comments
Exceptions:	EX1: Database error 1. Fails to retrieve feedback and reports, nothing is shown EX2: Network error 1. App displays “Error. Not connected to the internet.”

Use Case Name	Provide Feedback
Actor:	User, Database
Description:	Extends FAQ page by allowing users to provide feedback on their experience with the app
Preconditions:	User is logged in and is on the Support page
Postconditions:	User's feedback is stored in the database for review
Flow of Events:	S1: User scrolls down to feedback form S2: User enters name, email, message, selects a subject and gives a rating S3: User clicks “Submit Feedback” S4: App confirms submission with a window message "Thank you for your feedback. We appreciate your input." S5: Feedback is stored in the system for admin to review
Alternative Flows:	AF-S3-1: Email is missing ‘@’

	1. App displays message “Please include an ‘@’ in the email address.” 2. Submission fails AF-S3-2: Input field is missing 1. App displays message “Please fill out this field.” 2. Submission fails AF-S3-3: No rating is given 1. Submission fails
Exceptions:	EX1: Feedback submission fails due to system error 1. App displays "There was an error submitting your feedback. Please try again later." EX2: Feedback text exceeds character limit 1. App displays "Your feedback is too long. Please shorten your message." EX3: Network error 1. App displays “Error. Not connected to the internet.”

Use Case Name	Change Language
Actor:	User, Database
Description:	Allows user to change language of user interface
Preconditions:	User is on web app
Postconditions:	User interface language changed to preferred language
Flow of Events:	S1: User clicks “EN” dropdown in the header

	S2: App dropdown displays the available languages S3: User selects a different language, and system retrieves translations from database S4: User interface language changed and system saves language chosen in local storage as a string S5: Language is constant when user navigates to other pages
Alternative Flows:	AF-S3: User clicks dropdown again and cancels language change 1. No change in user interface
Exceptions:	EX1: Language change fails due to system error 1. App displays “Unable to change language. Please try again later.” EX2: Database error 1. App displays “Unable to change language. Please try again later. EX3: Network error 1. App displays “Error. Not connected to the internet.”

Use Case Name	Swap between light and dark mode
Actor:	User
Description:	Allows user to enable light or dark mode
Preconditions:	User is on web app

Postconditions:	User interface colours changed
Flow of Events:	S1: User clicks sun (or moon) icon to enable dark (or light) mode S2: User interface colours changed

Use Case Name	Access Forum
Actor:	User, Database
Description:	Allows user to access community forum to interact with other users and share experiences
Preconditions:	User is on web app
Postconditions:	User views posts from other users or successfully posts/comments
Flow of Events:	S1: User navigates to Forum Page S2: App fetches recent posts from the Database S3: User scrolls and views others' posts S4: If user is logged in, he can make posts, comments, report post/comment (see included use cases)
Alternative Flows:	AF-S4-1: User is not logged in 1. User can only view posts 2. App displays message "Please log in to create a post."
Exceptions:	EX1: Database error

	1. App displays “Unable to fetch posts” EX2: Network error 1. App displays “Error. Not connected to the internet.”
Includes:	Make/Delete Post, Report Post, Comment, Edit/Delete Comment

Use Case Name	Make/Delete Post
Actor:	User, Database
Description:	Allows user to make and share a post
Preconditions:	User is logged in and in the forum page
Postconditions:	User successfully posts a post
Flow of Events:	S1: User enters title, content and attaches an image if he wants to S2: User makes a post by clicking ‘Create Post’ S3: If there are no problems app creates a new document for his post and stores it in the database, with relevant attributes like id, title, content, image, username, date, comments array and deleted S4: User can edit posts he made by clicking “View Post” on his post then “Edit Post” S5: If user edits post, he can edit title, content and image S6: User is done editing and clicks “Save Changes”, post is updated

Alternative Flows:	AF-S3-1: Attachment has invalid file type or its size is too big 1. Attachment is not uploaded and post is created without it AF-S4-1: User clicks “Delete Post” instead of “Edit Post” 1. App pops up a window and asks, “Are you sure you want to delete this post?” 2. User clicks “Yes” (if “No” skip 3 and 4) 3. App sets the “deleted” status of the post in database to true 4. The post is no longer displayed AF-S4-2: If user is admin account and post is not his 1. Admin can delete all posts but not edit others’ posts AF-S6-1: Attachment has invalid file type or its size is too big 1. Attachment is not uploaded and post is updated without it
Exceptions:	EX1: Database error 1. App displays “Database error. Please try again later.” EX2: Network error 1. App displays “Error. Not connected to the internet.” EX3: Post text exceeds character limit 1. App displays "Your post is too long. Please shorten your text." EX4: Post submission fails due to system error 1. App displays "There was an error submitting your post. Please try again later."

Use Case Name	Report Post
Actor:	User, Database
Description:	Allows user to report post or comment
Preconditions:	User is logged in and in the forum page
Postconditions:	User successfully reports a post or comment
Flow of Events:	S1: User clicks “View Post” on a post he wants to make a report on S2: User clicks the flag icon below a post or comment and text box opens S3: User enters reason for reporting and clicks “submit” S4: System stores report in database for admin to review
Alternative Flows:	AF-S2: If not logged-in or creator of post or comment is user 1. Flag icon is not shown AF-S3: User clicks “Cancel” instead of “Submit” 1. Text box closes
Exceptions:	EX1: Database error 2. App displays “Database error. Please try again later.” EX2: Network error 2. App displays “Error. Not connected to the internet.” EX3: Report text exceeds character limit

	2. App displays "Your post is too long. Please shorten your text." EX4: Report submission fails due to system error 2. App displays "There was an error submitting your report. Please try again later."

Use Case Name	Comment
Actor:	User, Database
Description:	Allows user to comment on other's posts
Preconditions:	User is logged in and on a post page
Postconditions:	User successfully comments on a post
Flow of Events:	S1: User sees a post and has something to comment S2: User types comment in provided text field S3: If there are no problems user posts his comment by clicking ‘Comment’ S4: App stores his comment in the database by updating the document containing the post being commented on and appending a comment object into the “comments” array
Exceptions:	EX1: Database error 3. App displays “Database error. Please try again later.” EX2: Network error 3. App displays “Error. Not connected to the internet.” EX3: Comment text exceeds character limit

	3. App displays "Your commentt is too long. Please shorten your text." EX4: Comment submission fails due to system error 3. App displays "There was an error submitting your comment. Please try again later."

Use Case Name	Edit/Delete Comment
Actor:	User, Database
Description:	Extends “Comment” by allowing users to edit or delete comments they made
Preconditions:	User is logged in and on a post page and has posted a comment
Postconditions:	User successfully edits or deletes comment on a post
Flow of Events:	S1: User clicks pencil icon S2: Text box opens and user edits comment S3: User clicks “Save” S4: System updates comment in database
Alternative Flows:	AF-S1: User clicks trash bin icon 1. App pops up a window and asks, “Are you sure you want to delete this comment?” 2. User clicks “Yes” (if “No” skip 3 and 4) 3. App sets the “deleted” status of the comment in database to true 4. The comment is no longer displayed AF-S3: User cancels edit comment

	1. Text box closes
Exceptions:	EX1: Database error 4. App displays “Database error. Please try again later.” EX2: Network error 4. App displays “Error. Not connected to the internet.” EX3: Comment text exceeds character limit 4. App displays "Your comment is too long. Please shorten your text." EX4: Comment submission fails due to system error 4. App displays "There was an error submitting your comment. Please try again later."