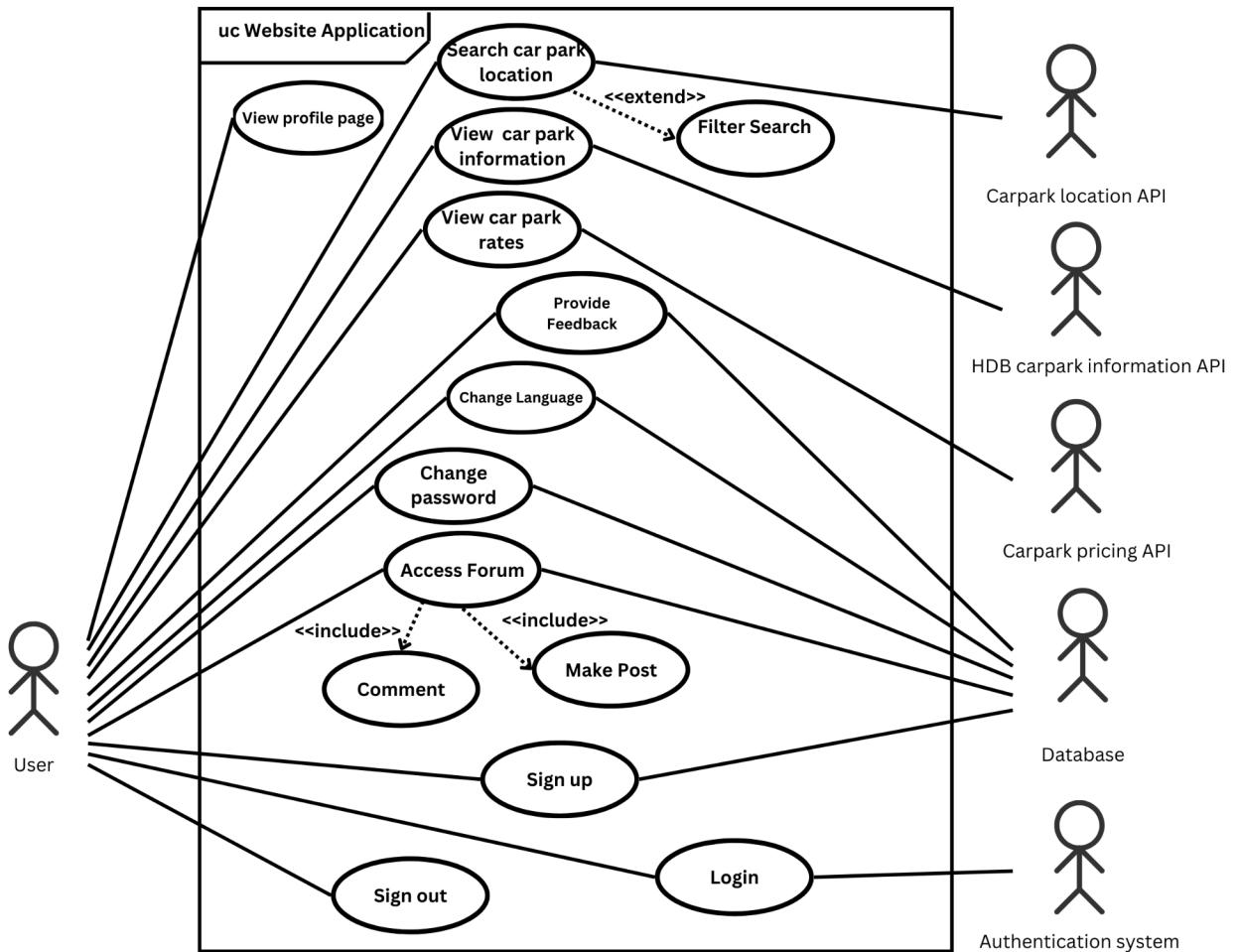


SC2006 FDAE TEAM 2 LAB 2

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USE CASE DIAGRAM



USE CASE DESCRIPTIONS

Use Case Name	Sign up
Actor:	User, Database
Description:	Allow new user to create account
Preconditions:	User does not have an existing account
Postconditions:	New user account created
Flow of Events:	<p>S1: User opens app for the first time</p> <p>S2: User is brought to login page</p> <p>S3: User clicks on “Sign up” button and redirected to sign up page</p> <p>S4: User enters relevant details (full name, email, userID, phone number, car plate number)</p> <p>S5: App stores new user information in database</p> <p>S6: User enters main page</p>
Alternative Flows:	<p>AF-S4-1: Email/Phone Number is in wrong format</p> <ol style="list-style-type: none">1. App displays “Please ensure Email/Phone Number is in correct format.” message2. App remains at step S4 until requirements are met <p>AF-S4-2: Password and Confirm Password doesn't Match</p> <ol style="list-style-type: none">1. App displays “Please ensure passwords match.” message

	<p>2. App remains at step S4 until requirements are met</p> <p>AF-S5: Email already registered</p> <ol style="list-style-type: none"> 1. App displays “Email already in use. Please use a different email or log in.” message 2. App returns to step S2
Exceptions:	<p>EX1: Database is inaccessible</p> <p>EX2: Network error</p> <ol style="list-style-type: none"> 1. App displays “Error. Not connected to the internet.”

Use Case Name	Login
Actor:	User, Authentication System
Description:	Allow user to log in
Preconditions:	<p>User has an existing account</p> <p>User has not logged in on device before</p>
Postconditions:	User is logged in and authenticated
Flow of Events:	<p>S1: User opens app</p> <p>S2: User is brought to login page</p> <p>S3: User enters email/password</p> <p>S4: Authentication System verifies login details with database</p> <p>S5: User is logged in successfully</p> <p>S6: User enters main page</p>

Alternative Flows:	<p>AF-S4-1: Login password is invalid</p> <ol style="list-style-type: none"> 1. App displays “Wrong Password. Please try again.” message 2. App returns to step S2 <p>AF-S4-2: Login email is invalid</p> <ol style="list-style-type: none"> 1. App displays “User does not exist. Please create a new account.” message 2. App returns to step S2
Exceptions:	<p>EX1: Password is entered wrongly 3 times and user exists</p> <ol style="list-style-type: none"> 1. App displays “You have entered an invalid password 3 times. Please change your password. ” 2. Initiate “Change Password” use case <p>EX2: Authentication System/ Database is inaccessible</p> <p>EX3: Network error</p> <ol style="list-style-type: none"> 1. App displays “Error. Not connected to the internet.”

Use Case Name	Change Password
Actor:	User, Database
Description:	Allow user to change password
Preconditions:	User has an existing account
Postconditions:	User password is changed
Flow of Events:	S1: User clicks on “Change Password”

	<p>S2: App requests user to enter existing password and new password twice</p> <p>S3: If no problems password is changed</p> <p>S4: App updates the database</p>
Alternative Flows:	<p>AF-S1: User forgot password and failed to login thrice and was redirected to change password</p> <ol style="list-style-type: none"> 1. App sends an OTP to user through mobile/email 2. App requests user to enter OTP 3. User enters OTP 4. App verifies OTP with authentication system 5. Skip to step S4 when OTP is correct, else display 'Please enter the correct OTP.' <p>AF-S3: Password and Confirm Password doesn't Match</p> <ol style="list-style-type: none"> 1. App displays "Please ensure passwords match." message 2. App remains at step S2 until requirements are met
Exceptions:	<p>EX1: Authentication System/ Database is inaccessible</p> <p>EX2: Network error</p> <ol style="list-style-type: none"> 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:	<p>User is logged in and authenticated</p> <p>User is on the main page</p>

Postconditions:	User is logged out and return to the login page
Flow of Events:	<p>S1: User taps the “Sign Out” button</p> <p>S2: App prompts user with a confirmation message “Are you sure you want to sign out?”</p> <p>S3: User confirms the sign-out action</p> <p>S4: App clears user session data</p> <p>S5: User is signed out and redirected to the login page</p>
Alternative Flows:	<p>AF-S3: User cancels sign-out</p> <ol style="list-style-type: none"> App returns to the main page without logging out
Exceptions:	<p>EX1: Sign-out fails due to a system error</p> <ol style="list-style-type: none"> App displays “There was an error signing you out. Please try again later.” message

Use Case Name	View Profile Page
Actor:	User
Description:	Allow users to view and update their profile information
Preconditions:	User is logged in and on the homepage
Postconditions:	User can view and update their profile information
Flow of Events:	<p>S1: User selects the “Profile” option from the navigation bar</p>

	<p>S2: App retrieves the user's profile data from the User Authentication System</p> <p>S3: App displays the user's profile information including email, username, vehicle number plate, and other relevant details</p> <p>S4: User can edit their details such as email, password, or vehicle number plate</p> <p>S5: User confirms changes and updates are saved to the User Authentication System</p> <p>S6: App confirms changes have been successfully updated</p>
Alternative Flows:	<p>AF-S4: User cancels profile updates</p> <ol style="list-style-type: none"> App returns to the homepage without saving any changes
Exceptions:	<p>EX1: Profile update fails due to system error</p> <ol style="list-style-type: none"> App displays "There was an error updating your profile. Please try again later."

Use Case Name	Search car park location
Actor:	User, Carpark Location API
Description:	Allow users to search for specific car park locations
Preconditions:	User is logged in and on the homepage
Postconditions:	User is presented with search results for car park locations
Flow of Events:	S1: User enters a location or address into the search bar

	<p>S2: App processes the input and retrieves matching car park locations from the Car Park Information System</p> <p>S3: App displays a list of car parks that match the search query, including their names and general location information</p> <p>S4: User can click on any car park in the list for more detailed information</p>
Alternative Flows:	<p>AF-S2-1: No matching car parks found</p> <ol style="list-style-type: none"> 1. App displays “No car parks found matching your search. Please try again with different keywords.” 2. Return to step S1
Exceptions:	<p>EX1: Search query fails due to system error.</p> <ol style="list-style-type: none"> 1. App displays “There was an error processing your search. Please try again later.” <p>EX2: API rate limit exceeded.</p> <ol style="list-style-type: none"> 1. App displays “There was an overload of requests. Please try again later.” <p>EX3: Network error</p> <ol style="list-style-type: none"> 1. App displays “Error. Not connected to the internet.”

Use Case Name	Filter Search
Actor:	User, Carpark Location API
Description:	Extends search by allowing users to filter by types of parking, payment options, and amenities like electric vehicle charging stations
Preconditions:	User is logged in and on the homepage

Postconditions:	User is presented with filtered search results for car parks
Flow of Events:	<p>S1: User enters a location or address into the search bar</p> <p>S2: User chooses from a list of filters to filter the search result by</p> <p>S3: App displays a list of car parks that match the search query and filters, including their names and general location information</p> <p>S4: User can click on any car park in the list for more detailed information</p>
Alternative Flows:	<p>AF-S3: No matching car parks found</p> <ol style="list-style-type: none"> App displays "No car parks found matching your search. Please try again with different keywords."
Exceptions:	<p>EX1: Search query fails due to system error</p> <ol style="list-style-type: none"> App displays "There was an error processing your search. Please try again later." <p>EX2: API rate limit exceeded.</p> <ol style="list-style-type: none"> App displays "There was an overload of requests. Please try again later." <p>EX3: Network error</p> <p>App displays "Error. Not connected to the internet."</p>

Use Case Name	View car park information
Actor:	User, HDB Carpark Information API

Description:	Allow users to view real-time availability and information about HDB car parks
Preconditions:	User is logged in and on the homepage
Postconditions:	User views the real-time availability and information of parking lots
Flow of Events:	<p>S1: User selects a car park from the list or searches for a specific car park</p> <p>S2: App retrieves real-time parking availability for the selected car park</p> <p>S3: App displays the parking lot details including rates, operating hours, gantry height, and payment methods</p>
Alternative Flows:	<p>AF-S2: No parking lots available</p> <ol style="list-style-type: none"> App displays “No available parking lots at the moment. Please try again later.”
Exceptions:	<p>EX1: Real-time data retrieval fails</p> <ol style="list-style-type: none"> App displays “Unable to retrieve parking availability. Please try again later.” <p>EX2: Network error</p> <p>App displays “Error. Not connected to the internet.”</p>

Use Case Name	View car park rates
Actor:	User, Carpark Pricing API
Description:	Allow users to view the parking rates for selected car parks based on the date and time

Preconditions:	User is logged in and has selected a specific car park
Postconditions:	User views the parking rates for the selected car park
Flow of Events:	<p>S1: User selects a car park to view details</p> <p>S2: App displays the car park details, including the available parking rates</p> <p>S3: User selects a date and time for parking to see specific rates for that period</p> <p>S4: App displays the relevant rates based on the user's selection</p> <p>S5: User can choose to reserve a parking spot based on the displayed rates</p>
Alternative Flows:	<p>AF-S3: No rates available for selected date and time</p> <ol style="list-style-type: none"> App displays "No available parking rates for the selected time. Please try a different time."
Exceptions:	<p>EX1: Rates retrieval fails due to system error</p> <ol style="list-style-type: none"> App displays "There was an error retrieving parking rates. Please try again later."

Use Case Name	Change Language
Actor:	User, Database
Description:	Allows user to change language of user interface
Preconditions:	User is logged in

Postconditions:	User interface language changed to preferred language
Flow of Events:	<p>S1: User enters Profile Page</p> <p>S2: User navigates to the settings section of the Profile Page</p> <p>S3: User selects the "Language" option from the settings menu</p> <p>S4: App displays a list of available languages</p> <p>S5: User selects their preferred language from the list</p> <p>S6: App updates the interface language to the selected language by fetching the translations from the Database</p> <p>S7: App confirms the language change and displays a message "Language updated successfully."</p>
Alternative Flows:	<p>AF-S4: No available languages</p> <ol style="list-style-type: none"> If there are no available languages for the user to choose from, the app displays a message "No language options are available at the moment." App returns to the Profile Page or settings section for the user to take further action. <p>AF-S5: User cancels language change</p> <ol style="list-style-type: none"> User chooses to cancel the language change after selecting a language. App returns to the Profile Page without applying any language change.
Exceptions:	<p>EX1: Language change fails due to system error</p> <ol style="list-style-type: none"> App displays "Unable to update language settings. Please try again later." App returns to the Profile Page with no language change applied.

	<p>EX2: Language preference not saved after session restart</p> <ol style="list-style-type: none"> 1. App displays “Your language preference could not be saved. Please try again.” 2. User is prompted to reselect their language or return to default settings. <p>EX3: Database error</p> <ol style="list-style-type: none"> 1. App displays “Unable to update language settings. Please try again later. 2. App returns to the Profile Page with no language change applied. <p>EX4: Network error</p> <ol style="list-style-type: none"> 1. App displays “Error. Not connected to the internet.”
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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 logged in
Postconditions:	User views posts from other users or successfully posts
Flow of Events:	<p>S1: User navigates to Community Page</p> <p>S2: App fetches forum data from the Database</p> <p>S3: User granted access to Forum page</p> <p>S4: User scrolls and views others' posts</p>

Alternative Flows:	<p>AF-S4-1: User adds comments</p> <ol style="list-style-type: none"> 1. See included ‘Comment’ use case <p>AF-S4-2: User makes and shares a post</p> <ol style="list-style-type: none"> 2. See included ‘Make Post’ use case
Exceptions:	<p>EX1: Database error</p> <ol style="list-style-type: none"> 1. App displays “Unable to update language settings. Please try again later.” 2. App returns to the Profile Page with no language change applied. <p>EX2: Network error</p> <ol style="list-style-type: none"> 1. App displays “Error. Not connected to the internet.”
Includes:	Comment, Make Post

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:	<p>S1: User sees a post and has something to comment</p> <p>S2: User types comment in provided text field and adds image attachment if he wants to</p>

	<p>S3: If there are no problems user posts his comment by clicking 'Comment'</p> <p>S4: App stores his comment in the Database by updating the document containing the post being commented on</p>
Alternative Flows:	<p>AF-S3-1: Attachment has invalid file type</p> <ol style="list-style-type: none"> 1. App displays "Invalid attachment type. Please try again". 2. Attachment is not uploaded <p>AF-S3-2: Attachment file size is too big</p> <ol style="list-style-type: none"> 1. App displays "Please do not exceed 10mb." 2. Attachment is not uploaded <p>AF-S3-3: User cancels comment submission</p> <ol style="list-style-type: none"> 1. App returns to the previous screen without submitting any comment <p>AF-S5: User deletes comment after posting</p> <ol style="list-style-type: none"> 1. App removes comment from post document in Database and moves it to 'Deleted Comments' 2. Comment is no longer displayed
Exceptions:	<p>EX1: Database error</p> <ol style="list-style-type: none"> 1. App displays "Unable to update language settings. Please try again later." 2. App returns to the Profile Page with no language change applied. <p>EX2: Network error</p> <ol style="list-style-type: none"> 1. App displays "Error. Not connected to the internet." <p>EX3: Comment text exceeds character limit</p> <ol style="list-style-type: none"> 1. App displays "Your comment is too long. Please shorten your message."

	<p>EX4: Comment submission fails due to system error</p> <ol style="list-style-type: none"> App displays "There was an error submitting your comment. Please try again later."
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Use Case Name	Make Post
Actor:	User, Database
Description:	Allows user to make and share a post
Preconditions:	User is logged in and in the forum
Postconditions:	User successfully posts a post
Flow of Events:	<p>S1: User has something to share</p> <p>S2: User types post in text box and includes image attachments if he wants to</p> <p>S3: If there are no problems User makes a post by clicking 'Post'</p> <p>S4: App creates a new document for his post and stores it in the Database</p>
Alternative Flows:	<p>AF-S3-1: Attachment has invalid file type</p> <ol style="list-style-type: none"> App displays "Invalid attachment type. Please try again". Attachment is not uploaded <p>AF-S3-2: Attachment file size is too big</p> <ol style="list-style-type: none"> App displays "Please do not exceed 10mb." Attachment is not uploaded <p>AF-S3-3: User cancels post submission</p>

	<p>1. App returns to the previous screen without submitting any post</p> <p>AF-S5: User deletes post after posting</p> <ol style="list-style-type: none"> 1. App sets the status of post in Database to 'Deleted' 2. The post is no longer displayed
Exceptions:	<p>EX1: Database error</p> <ol style="list-style-type: none"> 1. App displays "Unable to update language settings. Please try again later." 2. App returns to the Profile Page with no language change applied. <p>EX2: Network error</p> <ol style="list-style-type: none"> 1. App displays "Error. Not connected to the internet." <p>EX3: Post text exceeds character limit</p> <ol style="list-style-type: none"> 1. App displays "Your post is too long. Please shorten your text." <p>EX4: Post submission fails due to system error</p> <ol style="list-style-type: none"> 1. App displays "There was an error submitting your comment. Please try again later."

Use Case Name	Feedback
Actor:	User, Database
Description:	Allows users to provide feedback on their experience with the app
Preconditions:	<p>User is logged in</p> <p>User is on the feedback page</p>

Postconditions:	User's feedback is stored in the database for review
Flow of Events:	<p>S1: User selects the "Feedback" option from the navigation menu</p> <p>S2: App prompts the user to enter their feedback</p> <p>S3: User enters feedback in the provided text field</p> <p>S4: User submits the feedback</p> <p>S5: App confirms submission with a message "Thank you for your feedback"</p> <p>S6: Feedback is stored in the system for review</p>
Alternative Flows:	<p>AF-S2-1: User cancels feedback submission</p> <ol style="list-style-type: none"> 2. App returns to the previous screen without submitting any feedback
Exceptions:	<p>EX1: Feedback submission fails due to system error</p> <ol style="list-style-type: none"> 2. App displays "There was an error submitting your feedback. Please try again later." <p>EX2: Feedback text exceeds character limit</p> <ol style="list-style-type: none"> 2. App displays "Your feedback is too long. Please shorten your message." <p>EX3: Network error</p> <ol style="list-style-type: none"> 1. App displays "Error. Not connected to the internet."

KEY BOUNDARY CLASSES AND CONTROL CLASSES

Boundary Classes — interaction between actor and system

- SearchInterface
- SignupForm
- ProfilePage
- ChangeLanguageInterface
- LoginForm
- ForumPage
- FeedbackPage
- HomePage

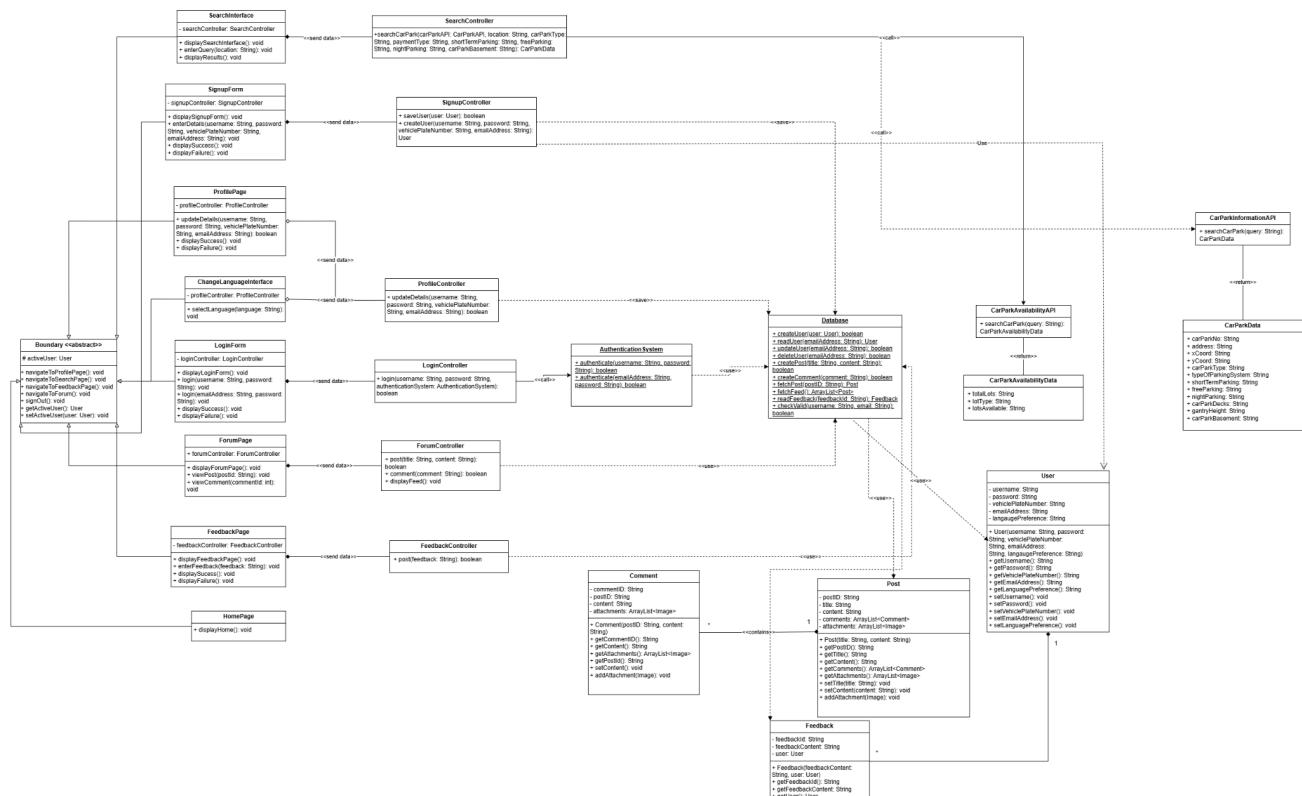
Control Classes — logic to realise use case

- SearchController
- SignupController
- ProfileController
- LoginController
- ForumController
- FeedbackController
- AuthenticationSystem

Entity Classes — information tracked by System

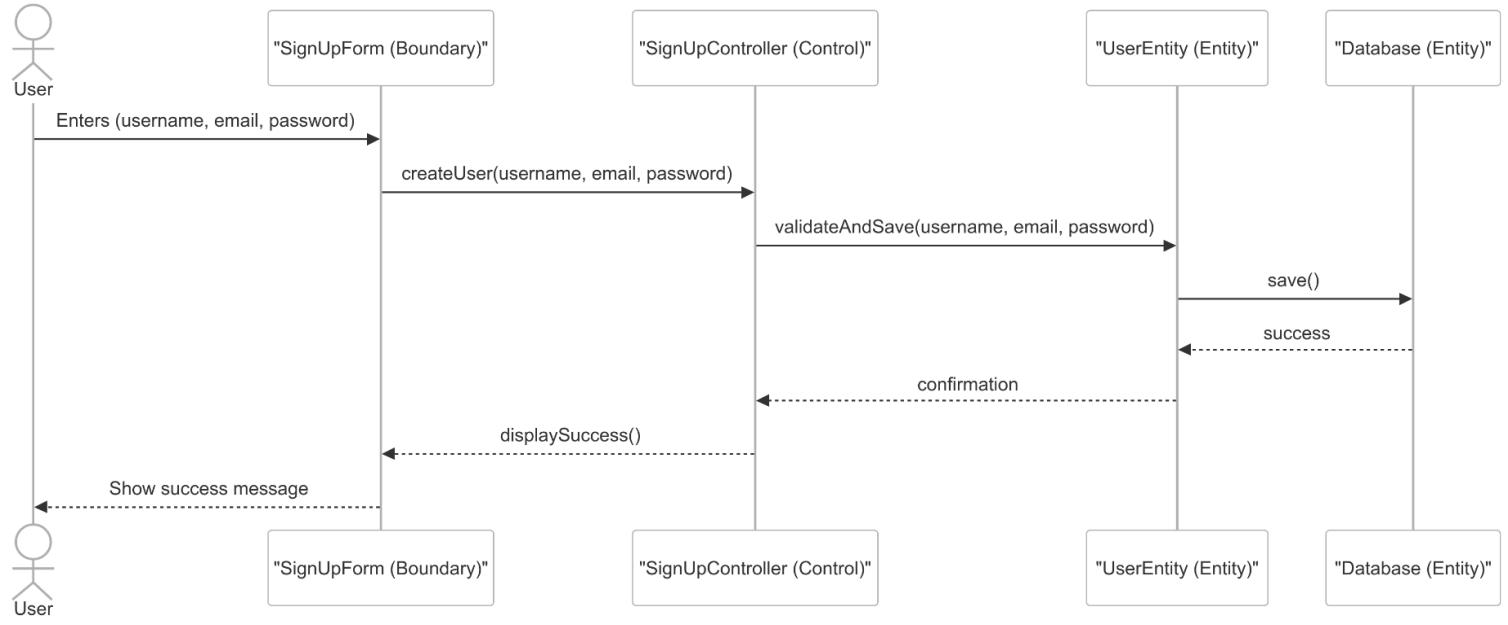
- CarparkInformationAPI
- CarparkAvailabilityAPI
- Database
- User
- Post
- Comment
- Feedback

CLASS DIAGRAM

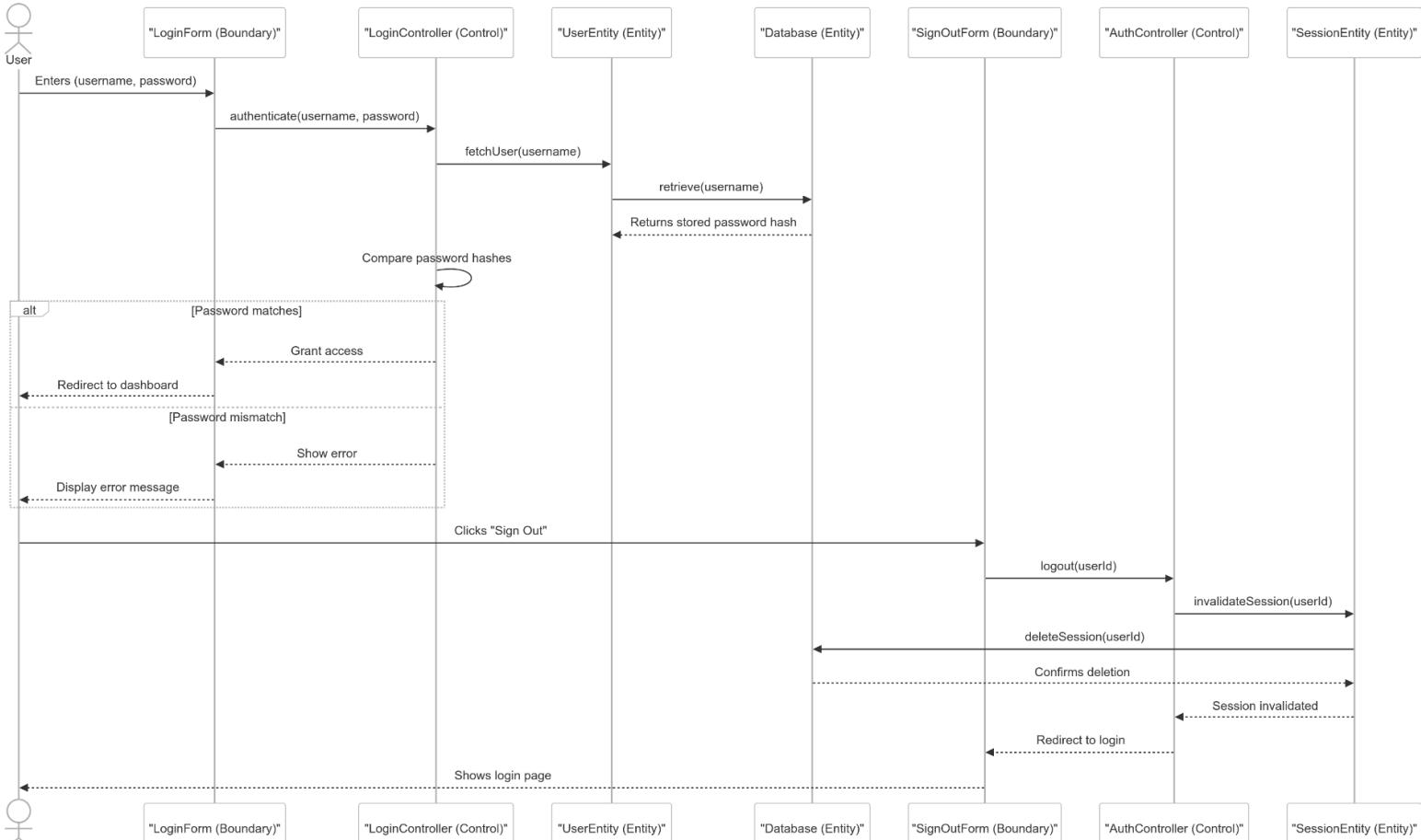


SEQUENCE DIAGRAM

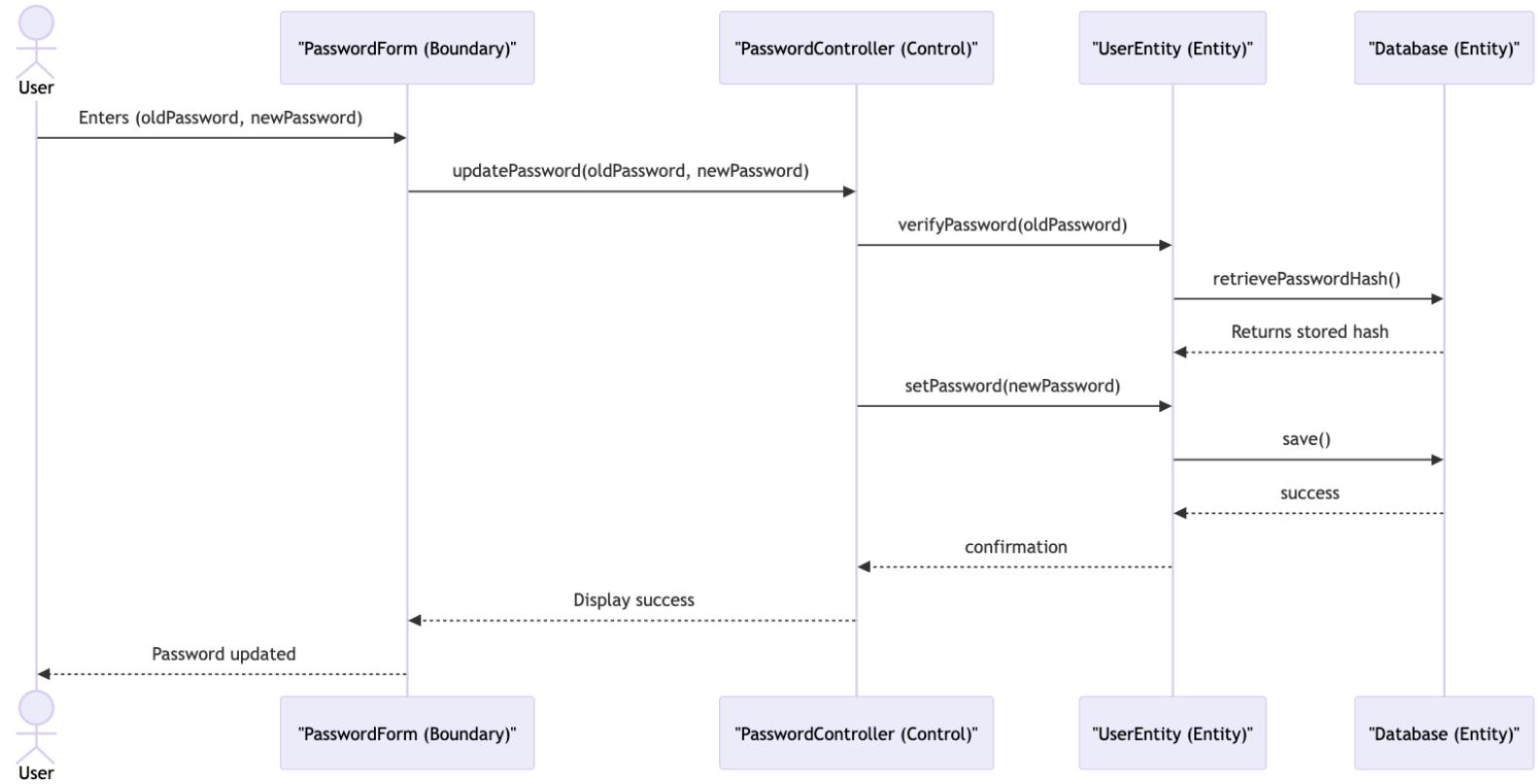
1. Sign Up



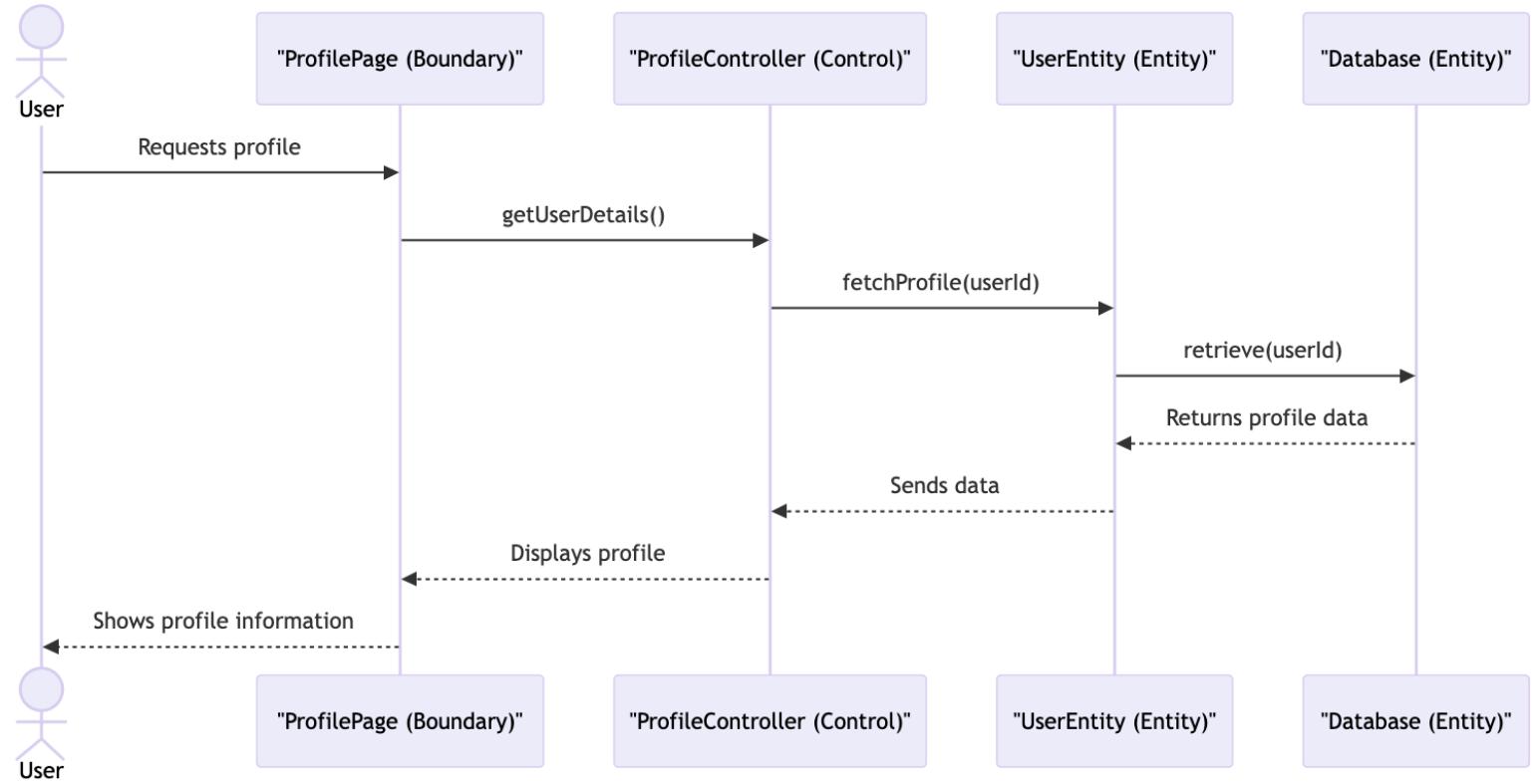
2. Login and Sign Out



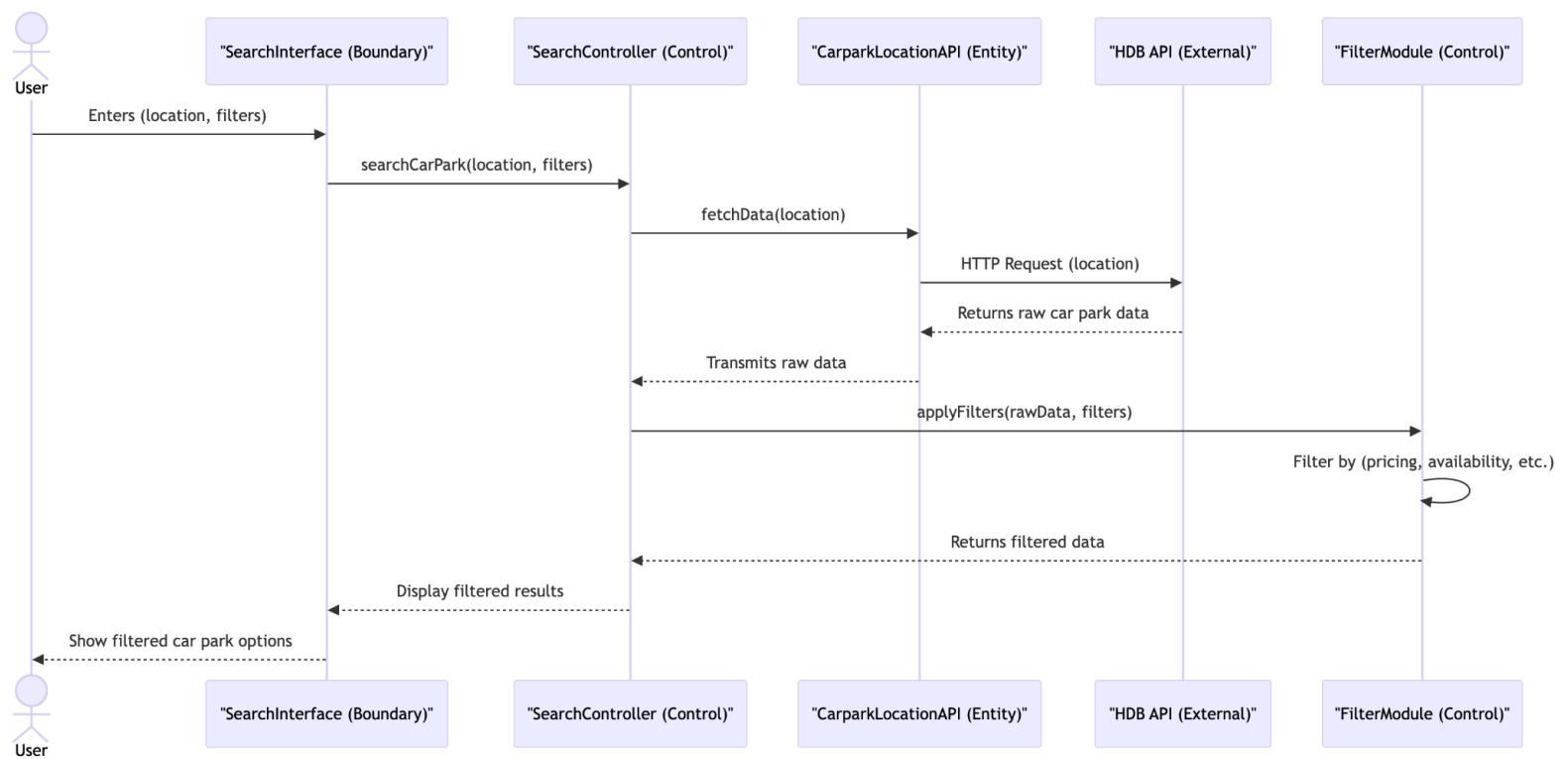
3. Change password



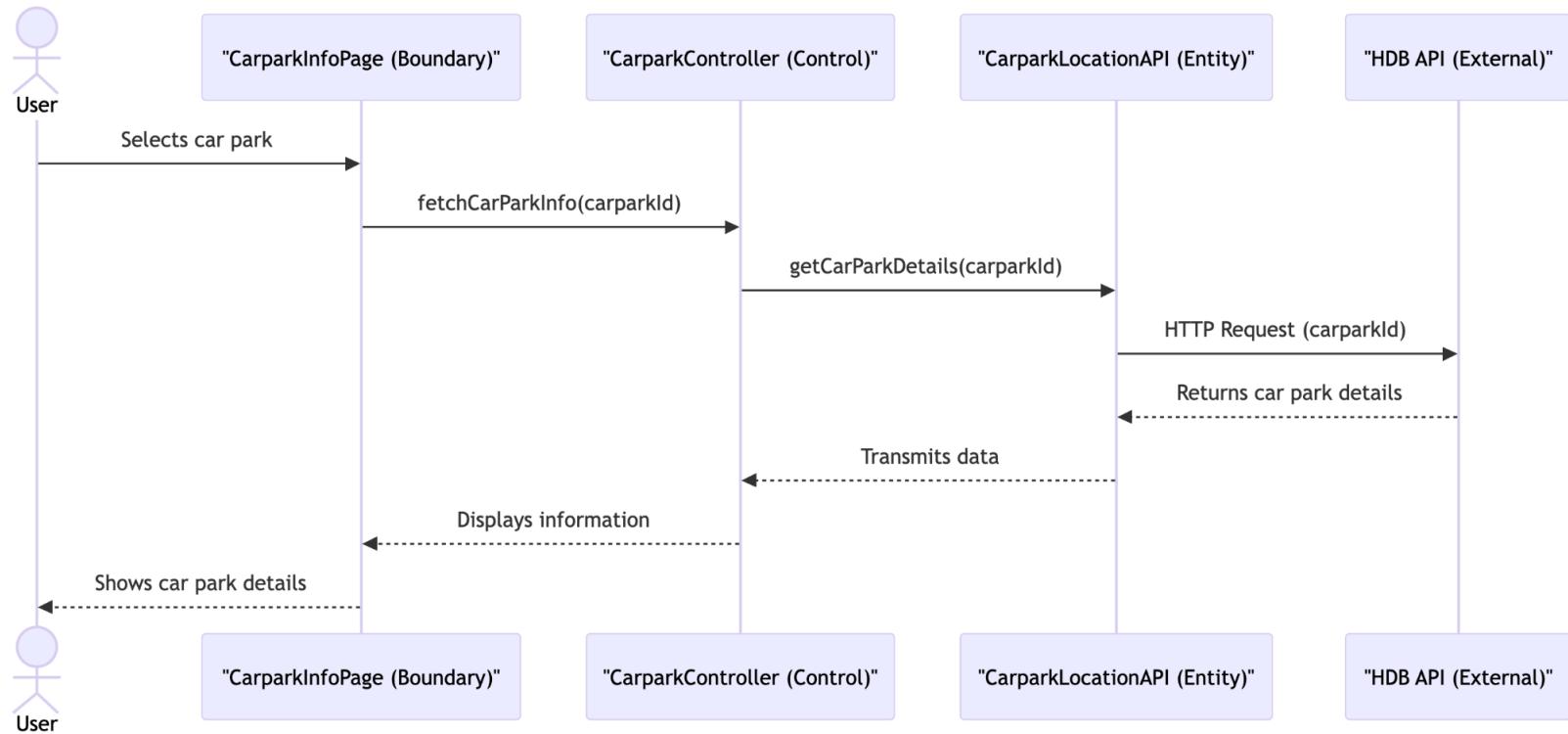
4. View profile page



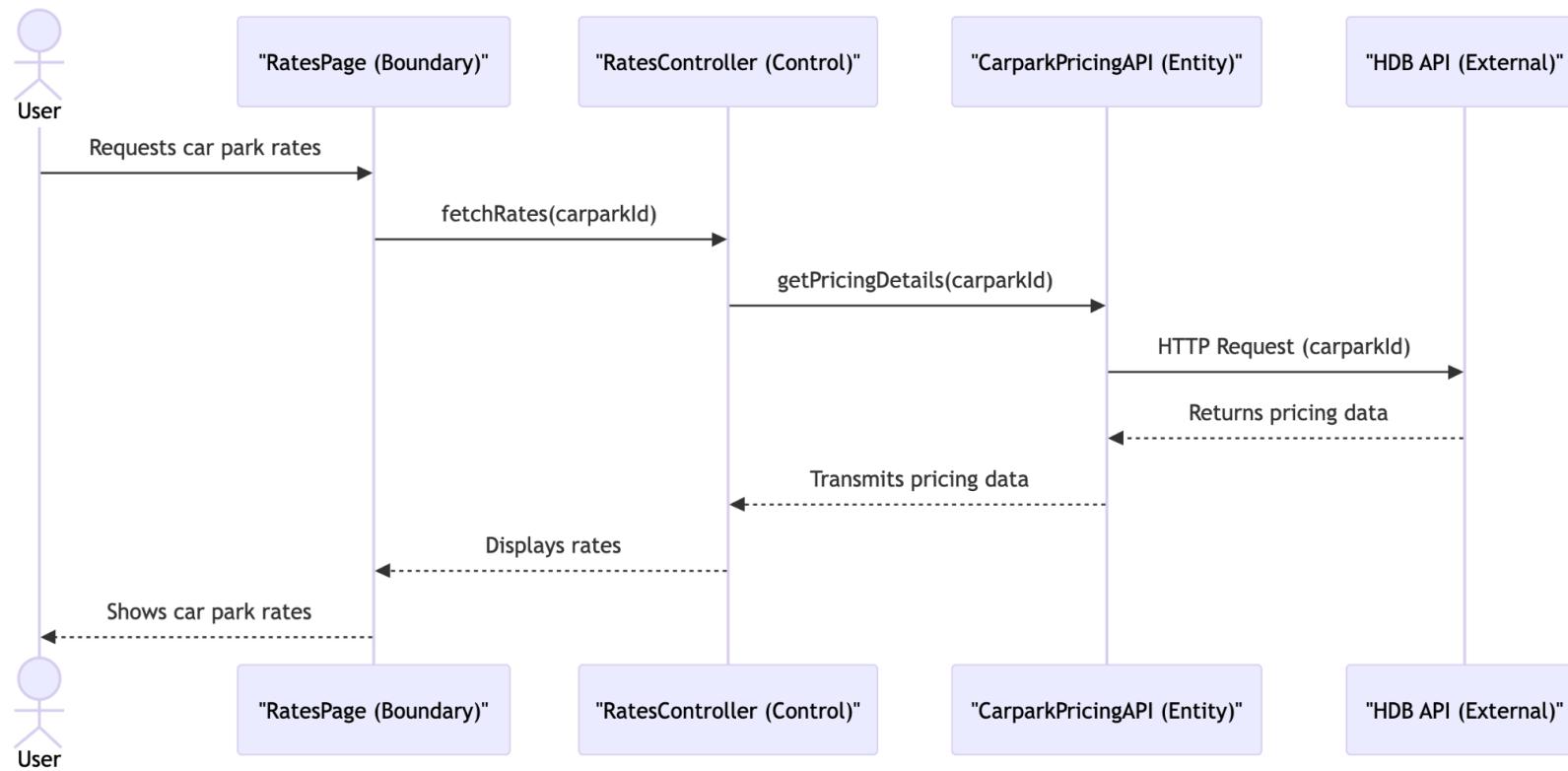
5. Search car park location (extend to) -> filter search



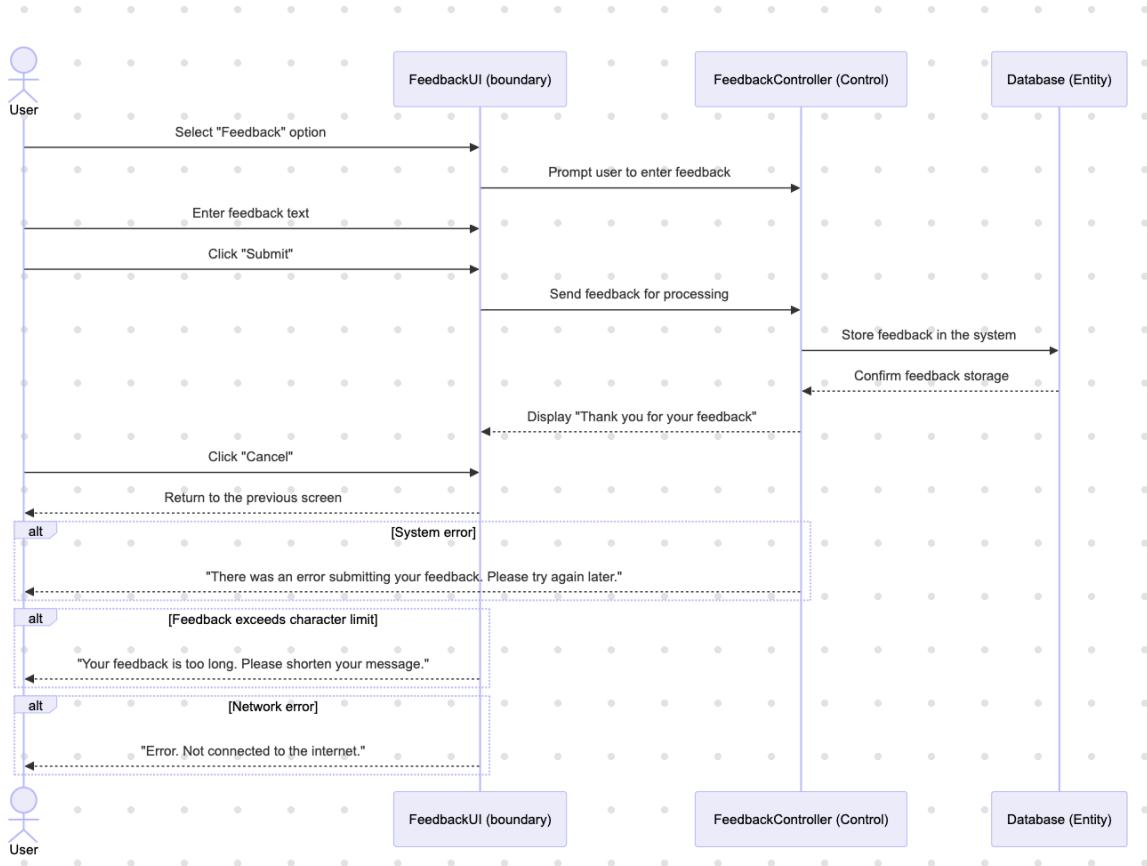
6. View car park information



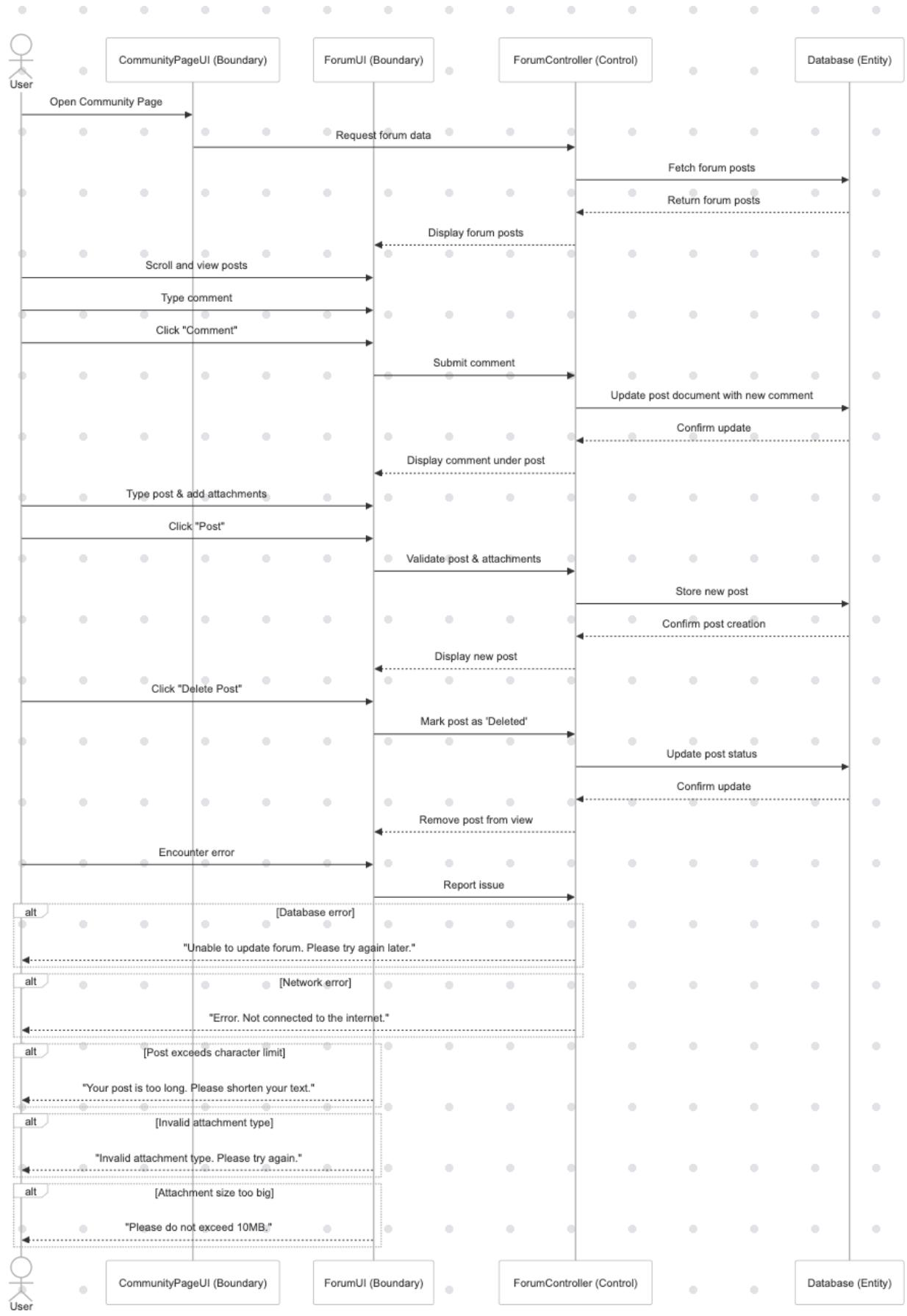
7. View car park rates



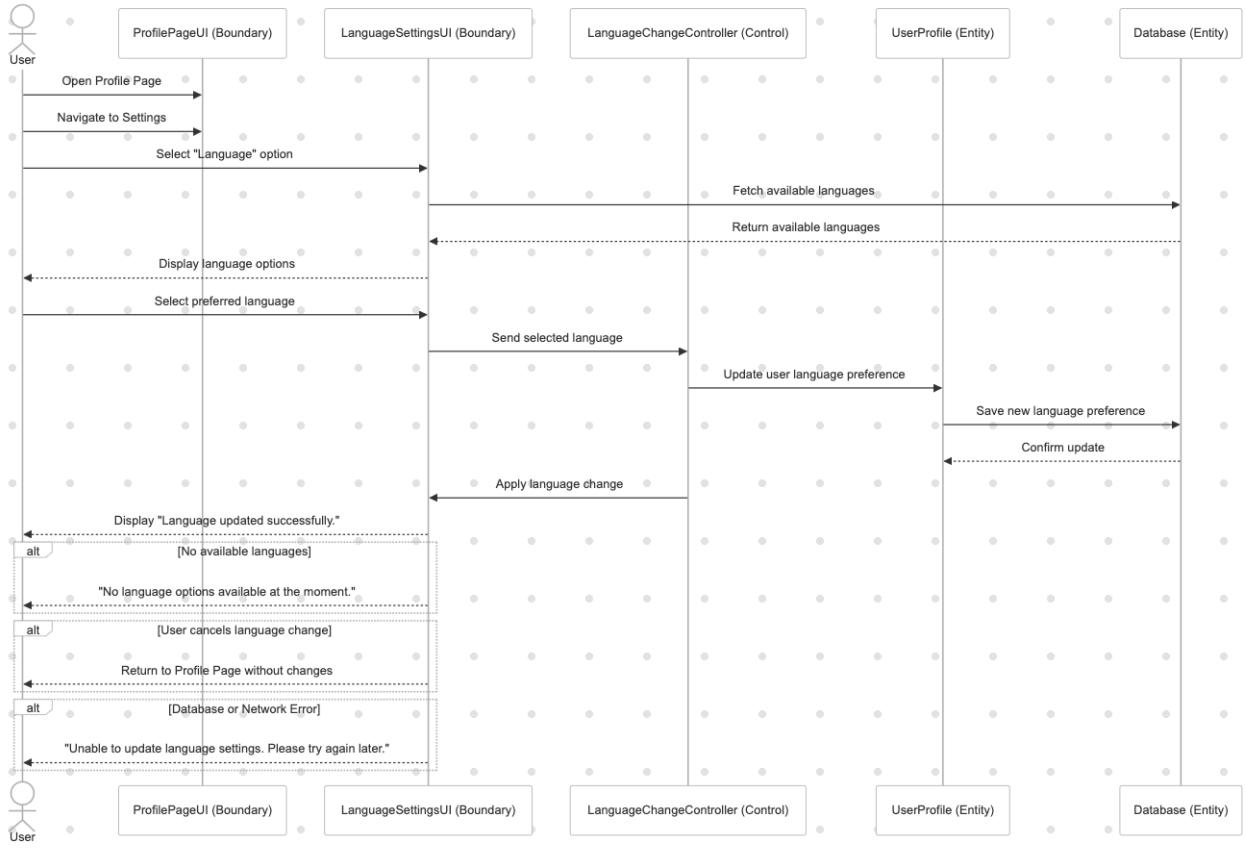
8. Give feedback



9. View forum (posting comments & pictures)



10. Change language



DIALOG MAP

