

CSC-204 Software Engineering

Design Document

Uet Route Management System



Submitted by:

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USER STORIES

Admin User Stories

- **Add Driver**
As an admin, I want to add a new driver by entering their details so that they can be assigned to a route.
- **Edit Driver Details**
As an admin, I want to update a driver's details so that I can correct errors or update outdated information.
- **Delete Driver**
As an admin, I want to delete a driver from the system so that I can remove inactive or invalid driver profiles.
- **View Driver Details**
As an admin, I want to view a driver's details so that I can verify or review their information when needed.
- **Add Bus**
As an admin, I want to add a new bus to the system so that I can associate it with a route.
- **Edit Bus Details**
As an admin, I want to edit bus details so that I can update information like plate numbers or capacity.
- **Delete Bus**
As an admin, I want to delete a bus so that unused or decommissioned buses are not displayed in the system.
- **View Bus Details**
As an admin, I want to view bus details so that I can confirm or check information like assigned routes or drivers.
- **Create Route**
As an admin, I want to create a new route by defining stops and timings so that buses can serve specific areas efficiently.
- **Edit Route Details**
As an admin, I want to edit route details so that I can update stop information or timings as needed.
- **Delete Route**
As an admin, I want to delete a route so that invalid or unused routes do not clutter the system.

- **View All Routes**

As an admin, I want to view all routes so that I can oversee the routes currently in operation.

- **Track Bus Location (Real-Time)**

As an admin, I want to track the real-time location of buses so that I can monitor their movements and ensure schedule compliance.

- **Assign Bus to Route**

As an admin, I want to assign a bus to a route so that I can ensure every route is operational.

- **Log Complaints**

As an admin, I want to view and resolve complaints submitted by users so that service quality can be improved.

- **Generate Reports**

As an admin, I want to generate reports on routes, complaints, and driver performance so that I can analyze and improve operations.

- **Manage User Accounts**

As an admin, I want to manage user accounts so that I can resolve issues related to user access or misuse.

User Stories for End Users

- **Sign Up**

As a user, I want to register for the app so that I can access the route information and other features.

- **Log In**

As a user, I want to log into the app so that I can securely access my dashboard and services.

- **View Dashboard**

As a user, I want to view my dashboard so that I can quickly access important information and app features.

- **Search for Routes**

As a user, I want to search for bus routes by entering my starting and ending points so that I can plan my travel.

- **View Route Details**

As a user, I want to view the details of a selected route so that I can understand the stops, timings, and driver information.

- **Track Bus Location (Real-Time)**

As a user, I want to track the real-time location of a bus so that I can estimate its arrival time.

- **Log a Complaint**

As a user, I want to log a complaint about the bus service so that my concerns can be addressed.

- **View Complaint History**

As a user, I want to view my complaint history so that I can track the status of my submissions.

- **Rate Driver/Service**

As a user, I want to rate a driver or the overall bus service so that I can provide feedback on my experience.

- **Access Notifications**

As a user, I want to receive notifications about delays, route changes, or resolved complaints so that I am always informed.

- **Feedback Submission**

As a user, I want to submit feedback about the app or service so that I can help improve the system.

System User Stories

- **Authenticate User**

As a system, I want to verify user credentials so that only authorized users can log in.

- **Validate Admin Actions**

As a system, I want to validate admin actions so that only authorized personnel can perform critical tasks.

- **Update Database**

As a system, I want to update the database whenever a driver, bus, or route is added, edited, or deleted so that information stays accurate.

- **Send Notifications**

As a system, I want to send notifications to users about service updates so that they are well-informed.

- **Prevent Duplicate Entries**

As a system, I want to prevent duplicate drivers, buses, or routes from being added so that the database remains clean.

- **Handle Complaints**

As a system, I want to store and manage complaints so that admins can resolve them efficiently.

- **Provide Map Integration**

As a system, I want to integrate with a map API so that users and admins can view routes and track buses in real time.

WIREFRAMES

User Panel

- **User Login:**



Log In to your account

Email ID
 

Password

[Forgot Password?](#)

Log In

New user? [Sign Up](#)

- **User SignUp:**



Create new account

Full Name

Phone Number

Email ID
 

Password

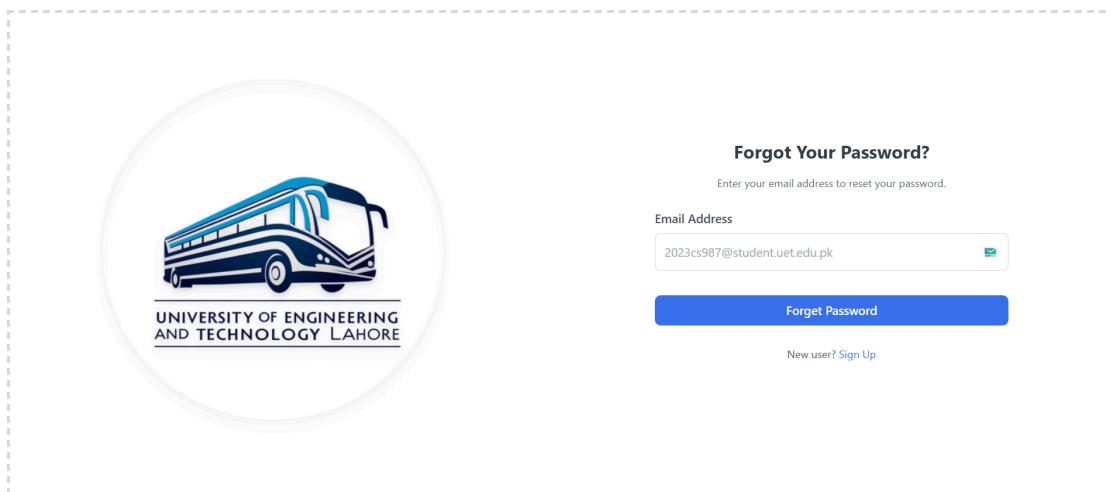
Confirm Password

Address

Sign Up

Already a user? [Login](#)

● Forget Password:



● User Dashboard:

The image shows the 'Route Manager' dashboard. The top navigation bar has a 'Logout' button on the right. On the left, there is a vertical sidebar with icons for search, location, routes, and other settings. The main content area has a blue header with the text 'Welcome here' and a sub-header 'We're glad to have you on board. Here's a quick guide to how the app works'. Below this, there is a section titled 'What Our App Does' with four cards: 'View Routes' (bus icon), 'Check Schedule' (clock icon), 'Real-Time Bus Location' (location pin icon), and 'Report Complaints' (warning icon). Each card has a brief description and a link to more information.

● Maps Page(location of stops & routes):

The image shows the 'Route Manager' map page. The map displays a detailed view of a city area with numerous bus routes represented by colored lines. Several red circular markers, each containing a white 'STOP' sign, indicate specific bus stops along these routes. The map includes street names in Urdu and English, as well as various landmarks and geographical features. The top navigation bar has a 'Logout' button on the right. On the left, there is a vertical sidebar with icons for search, location, routes, and other settings. The map interface includes zoom controls (+/-) and a search bar at the top left.

● Routes Board Page:

The screenshot shows the 'Route Manager' interface with a sidebar containing icons for route creation, stops, and user management. The main area displays three bus routes:

- Anarkali Route:** Driver name: Shafeq Ahmad, Driver Ph. no: 03120945231, Bus #: FBR-1023. All stops listed: Iet Ksk Campus, Band Road, University of Engineering and Technology (UET), Lahore.
- Route 01:** Driver name: Ansar, Driver Ph. no: 03293423457, Bus #: FBR-10232.
- Route 10:** Driver name: Maqood Khan, Driver Ph. no: 03278524486, Bus #: FBR-10234.

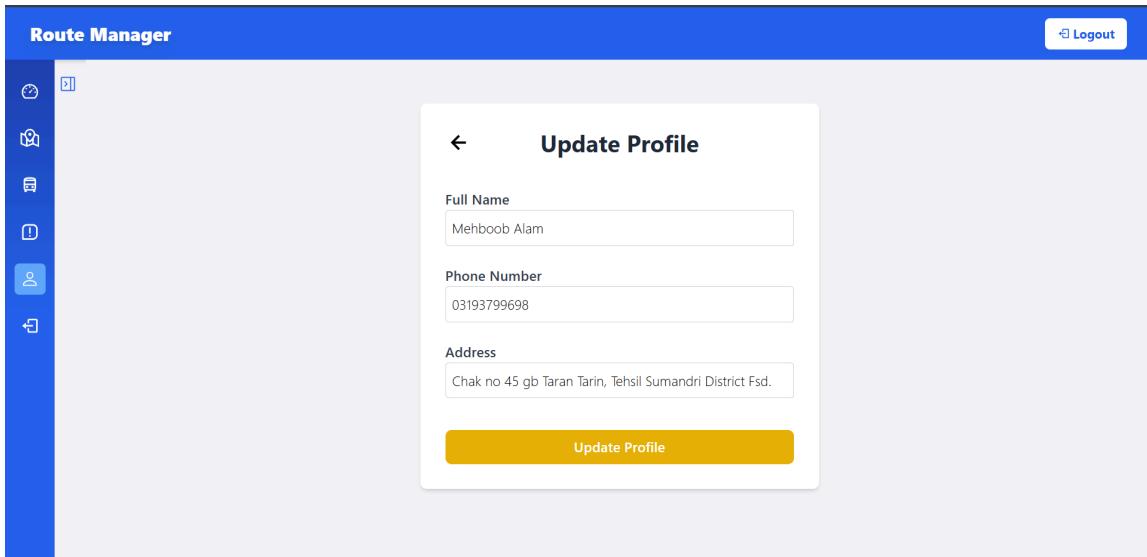
● User Complaint Page:

The screenshot shows the 'Report a Complaint' page within the 'Route Manager' interface. It features a registration number input field (e.g., 2020CS999) and a text area for complaint details, both with placeholder text. A blue 'Submit Complaint' button is at the bottom.

● User Profile Page:

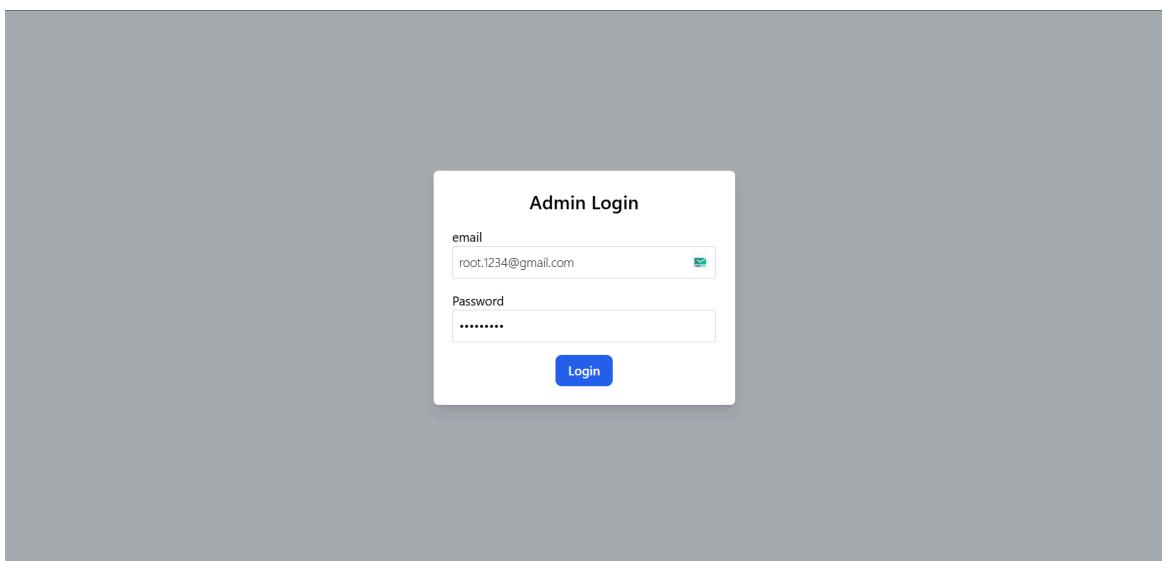
The screenshot shows the 'User Profile' page. It displays a welcome message 'Welcome, Mehboob Alam' and the email address 'mehboobalam786461@gmail.com'. Below this is a section for 'Contact Information' with the phone number '03193799698' and the address 'Chak no 45 gb Taran Tarin, Tehsil Sumandri District Fsd.'. At the bottom are 'Edit Profile' and 'Logout' buttons.

- **User Edit Profile:**

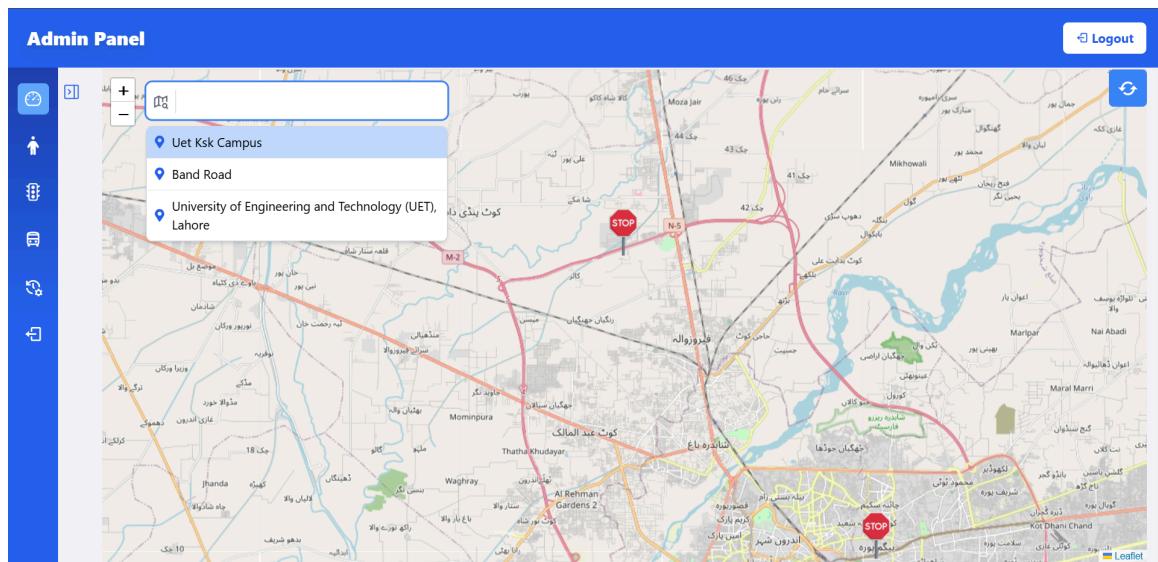


Admin Panel

- **Admin Login Page:**



● Admin dashboard:



● Drivers Page:

#	Name	Email	Available	Phone no	CNIC	Address	Actions
1	atifali@gmail.com	- available	03375926985	3310591234567	House # 15 , uet lahore new campus	edit	
2	masqoodkhan@gmail.com	- on work	03278524486	3310592420019	House # 1 , uet lahore new campus	edit	
3	shafeqAhmad@gmail.com	- on work	03120945231	3310567890018	House # 45, Uet lahore	edit	
4	ansar@gmail.com	- on work	03293423457	3310592420023	Bondi mohallah, Faisalabad	edit	

○ Add Driver:

Add New Driver

Name:

Email:

Phone Number:

CNIC:

Address:

[Back](#) [save](#)

- **Edit Driver:**

Edit Driver

Name: John Doe

Email: atifali@gmail.com

Phone Number: 03375926985

CNIC: 3310591234567

Address: House # 15 , uet lahore new campus

Back **save**

- **Stop Management Page:**

Stop Management

#	Stop Name	Latitude	Longitude	Actions
1	Uet Ksk Campus	31.693515	74.246157	
2	Band Road	31.5359839	74.2766261	
3	University of Engineering and Technology (UET), Lahore	31.5801604	74.356957	

Add New Stop

Refresh Page 1 of 1

- **Add Stop:**

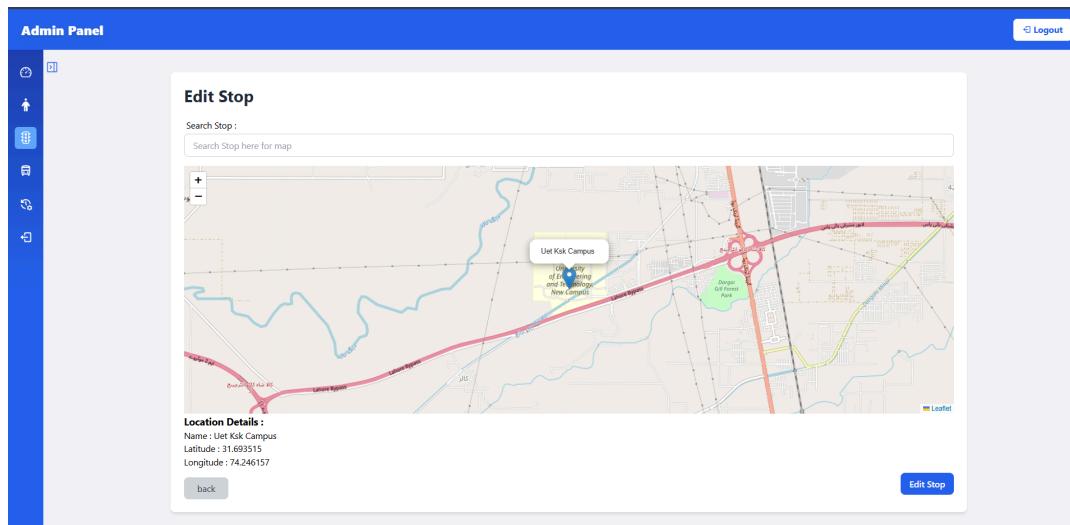
Add New Stop

Search Stop :
Search Stop here for map

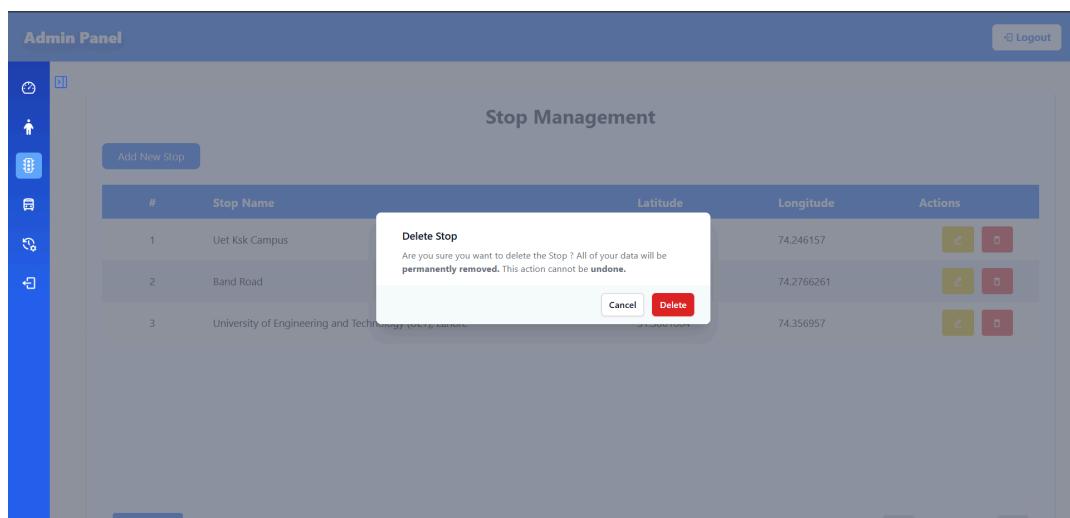
Location Details :
Name : Uet Ksk Campus
Latitude : 31.693515
Longitude : 74.246157

back **Add Stop**

- **Edit Stop:**



- **Delete Stop:**



● Routes Management Page:

The screenshot shows the 'Route Management' section of the Admin Panel. On the left, there is a vertical sidebar with icons for Home, User, Vehicle, Route, Stop, and Logout. The main area has a title 'Route Management' and a button 'Add New Route'. Below is a table with columns: #, Route, Driver Name, Bus #, Stops, and Actions. The table contains three rows:

#	Route	Driver Name	Bus #	Stops	Actions
1	Anarkali Route	Shafeq Ahmad	FBR-1023	University of Engineering and Technology (UET), Lahore - Band Road	
2	Route 01	Ansar	FBR-10232	Uet Ksk Campus - Uet Ksk Campus	
3	Route 10	Maqsood Khan	FBR-12034	Band Road - Uet Ksk Campus	

○ Add Route:

The screenshot shows the 'Add New Route' form. It includes fields for Route Name, Vehicle No, Driver (a dropdown menu with 'Select...'), and Stops (a dropdown menu with 'Select...'). There are 'Back' and 'Save' buttons at the bottom.

○ Edit Route:

Edit Route

Route Name
Anarkali Route

Vehicle No
FBR-1023

Driver
Shafeq Ahmad

Stops
Uet Ksk Campus × Band Road × University of Engineering and Technology (UET), Lahore ×

Back save

○ Delete Route:

Route Management

#	Route	Driver Name	Bus #	Stops	Actions
1	Anarkali Route	Shafeq Ahmad	FBR-1023	Uet Ksk Campus - Band Road	
2	Route 01			Uet Ksk Campus - Uet Ksk Campus	
3	Route 10			Uet Ksk Campus - Band Road	

Delete Route
Are you sure you want to delete the route Details ? All of your data will be **permanently removed**. This action cannot be **undone**.

Cancel Delete Route

● Complaint Management Page:

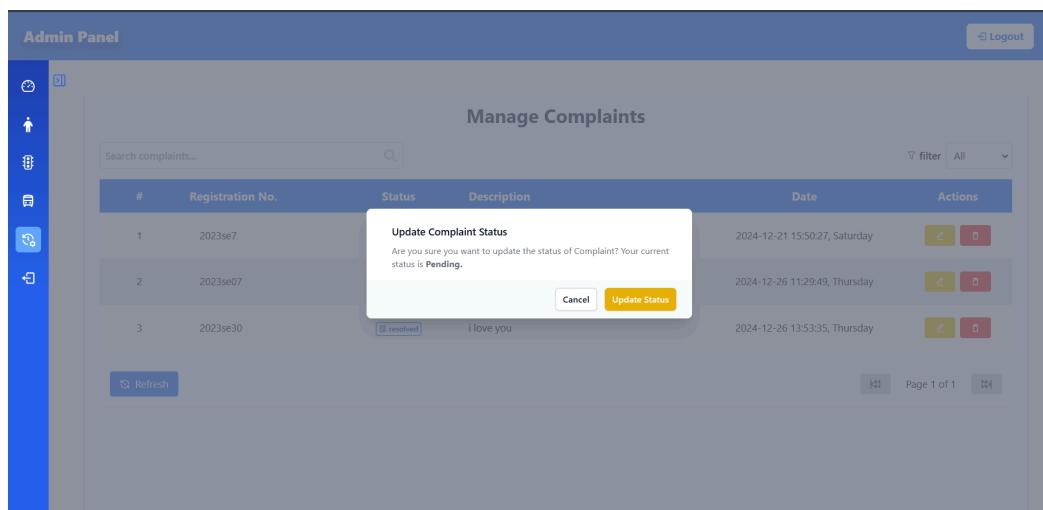
Manage Complaints

Search complaints... filter All

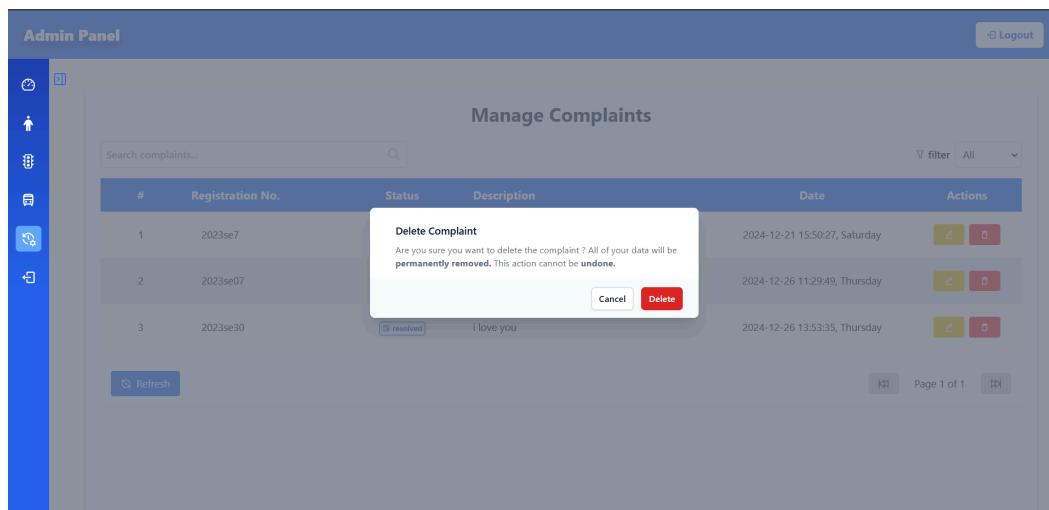
#	Registration No.	Status	Description	Date	Actions
1	2023se7		This is an error in chatting option	2024-12-21 15:50:27, Saturday	
2	2023se07		this complaint about not working email	2024-12-26 11:29:49, Thursday	
3	2023se30		i love you	2024-12-26 13:53:35, Thursday	

Refresh Page 1 of 1

- **Update Complaint Status:**

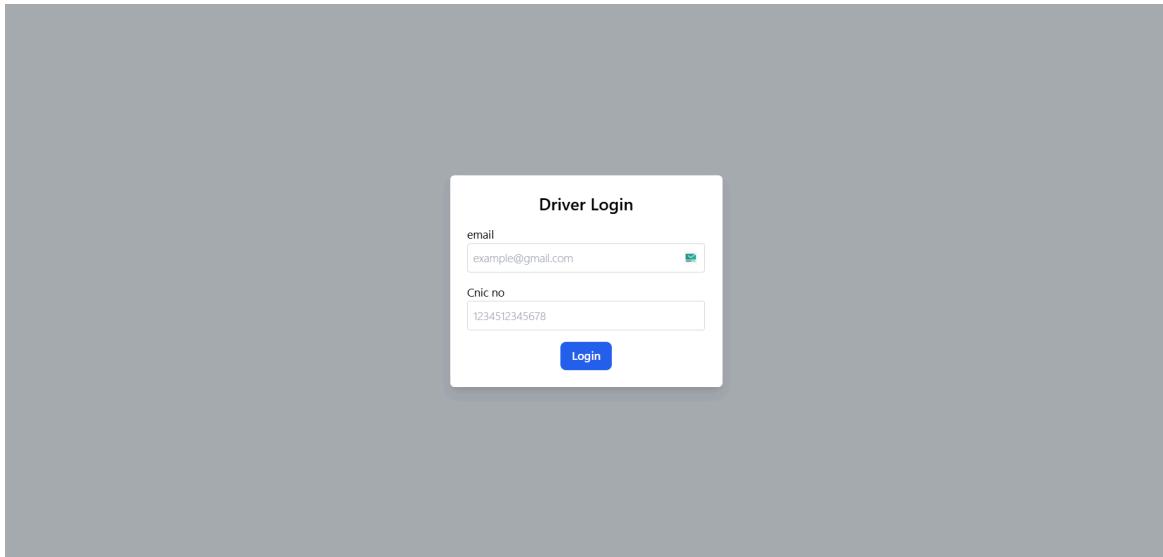


- **Delete Complaint:**

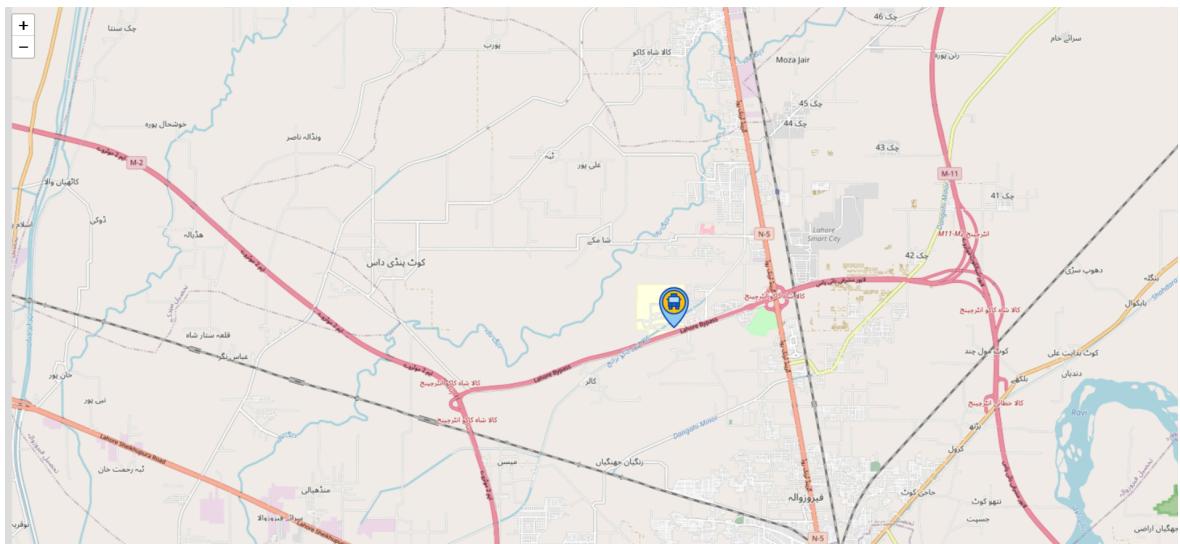


Driver Panel:

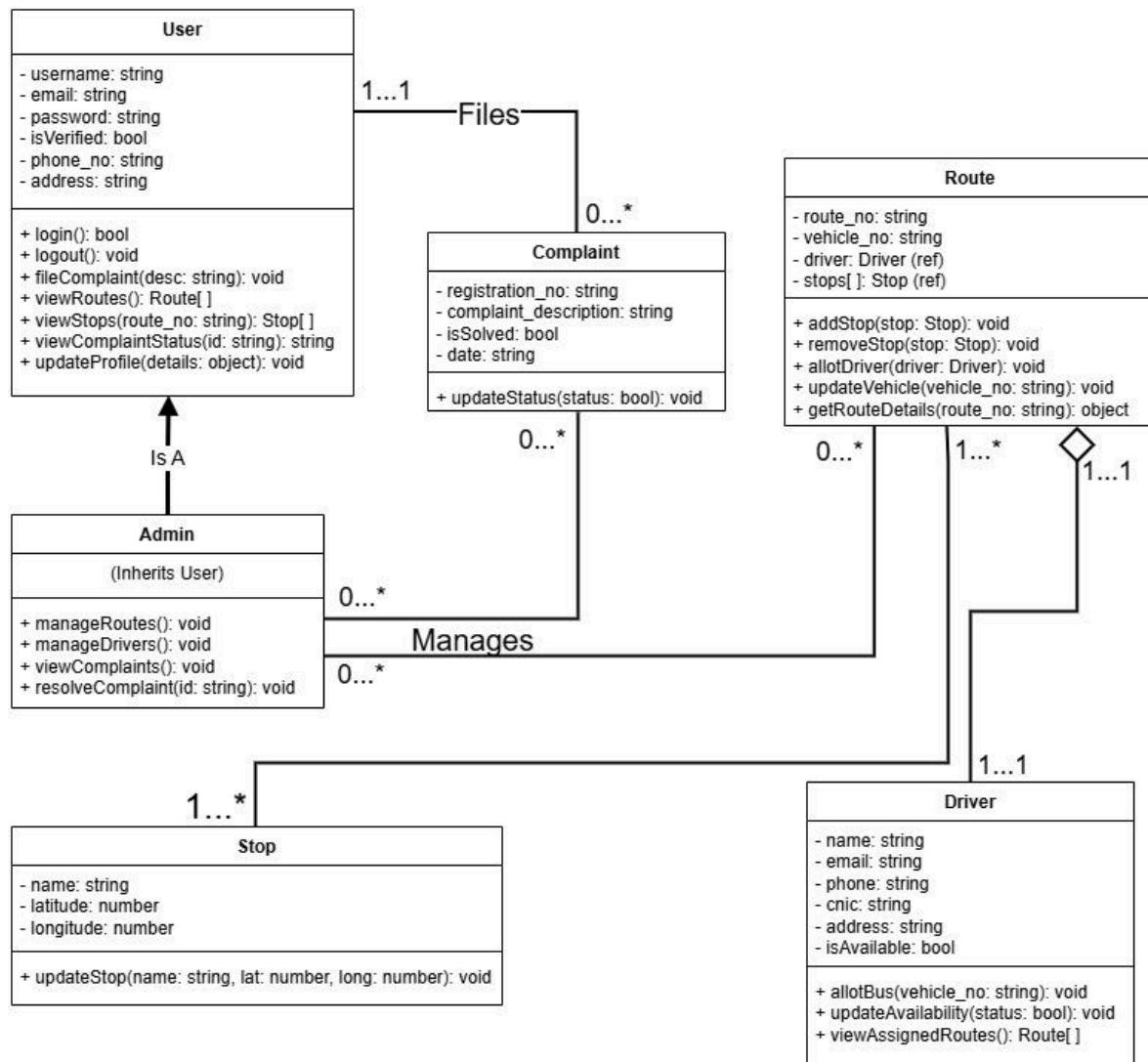
- Driver Login:



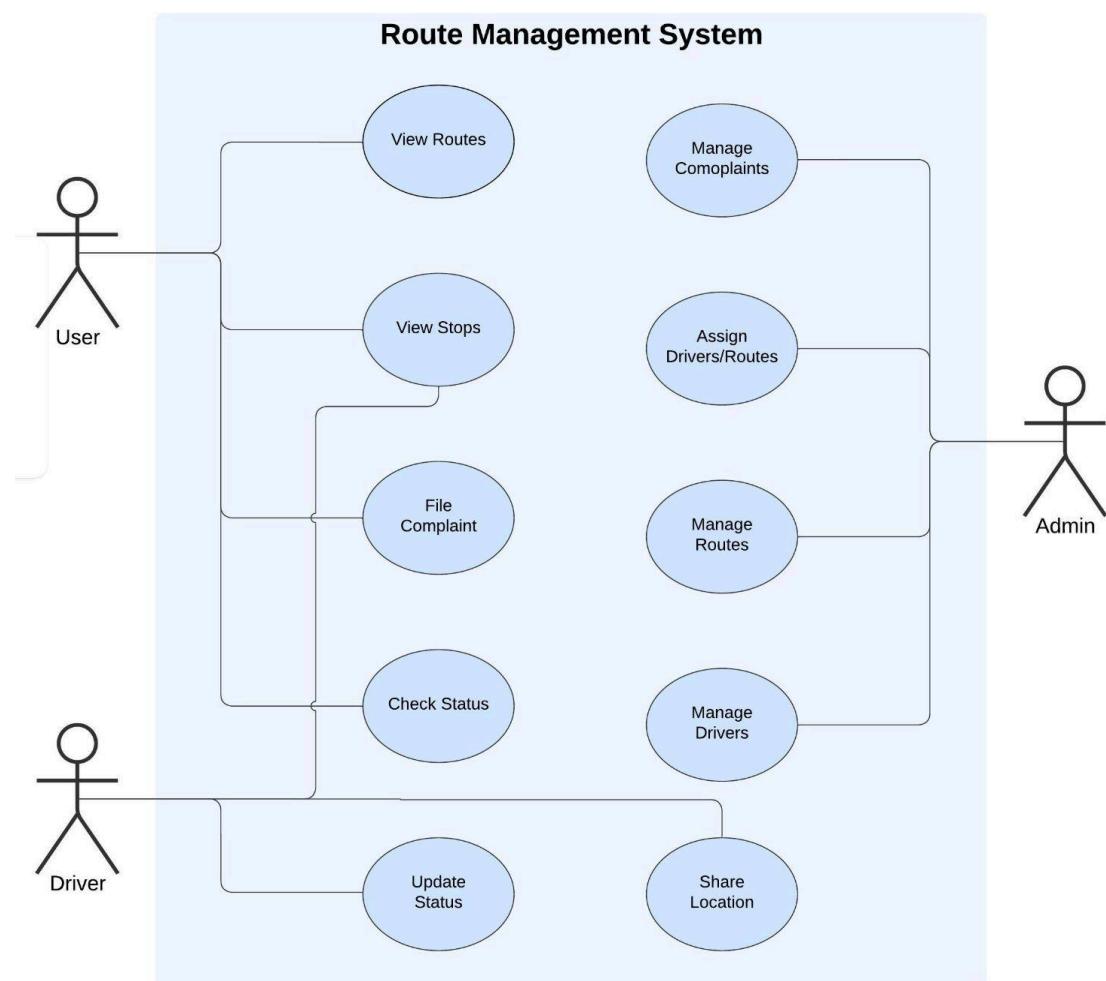
- Driver Dashboard(for location sharing):



CLASS DIAGRAM



USE CASE DIAGRAM



1. View Routes (User)

Attribute	Description
Name	View Routes
Participating Actors	User
Goals	To allow the user to view all available bus routes in the system.
Triggers	The user selects the "View Routes" option from the dashboard.
Pre-Condition	<ul style="list-style-type: none"> - The user is logged into the system. - Route data exists in the system.
Post-Condition	The system displays a list of routes with their numbers, stops, and schedules.
Basic Flow	<ol style="list-style-type: none"> 1. User clicks on "View Routes." 2. System fetches the list of routes. 3. System displays the route numbers, names, and schedules.
Alternate Flow	<ul style="list-style-type: none"> - If the user filters the routes: <ol style="list-style-type: none"> 1. User applies filters (e.g., destination, stops). 2. System shows filtered route results.
Exceptions	<ul style="list-style-type: none"> - If no routes are available, the system displays a "No Routes Available" message. - If the server is down, an error message is shown.
Qualities	<ul style="list-style-type: none"> - The system must fetch and display routes quickly. - The interface must be clear and user-friendly.

2. View Stops (User, Driver)

Attribute	Description
Name	View Stops
Participating Actors	User, Driver
Goals	To allow users and drivers to view stops for a selected route.
Triggers	The actor selects a specific route to view its stops.
Pre-Condition	<ul style="list-style-type: none"> - The actor must be logged into the system. - The selected route exists in the system.
Post-Condition	The stops for the selected route are displayed with their names and locations.
Basic Flow	<ol style="list-style-type: none"> 1. Actor selects a route. 2. System retrieves stops associated with the route. 3. Stops are displayed with their details.
Alternate Flow	<ul style="list-style-type: none"> - If no stops exist for the selected route: <ol style="list-style-type: none"> 1. System displays "No Stops Found" message.
Exceptions	<ul style="list-style-type: none"> - If the route data is unavailable due to a server issue, an error message is shown.
Qualities	<ul style="list-style-type: none"> - Stops must be displayed with accurate locations. - The interface should support a map-based view if required.

3. File Complaint (User)

Attribute	Description
Name	File Complaint
Participating Actors	User
Goals	To enable users to file a complaint regarding bus services.
Triggers	The user selects the "File Complaint" option.
Pre-Condition	<ul style="list-style-type: none"> - The user is logged into the system. - Valid route/vehicle information is provided.
Post-Condition	The complaint is stored in the system and marked as unresolved.
Basic Flow	<ol style="list-style-type: none"> 1. User selects "File Complaint." 2. User enters details such as registration number and complaint description. 3. Complaint is saved.
Alternate Flow	<ul style="list-style-type: none"> - If the user cancels the process, the complaint is not logged.
Exceptions	<ul style="list-style-type: none"> - If required fields are missing, the system prompts the user to fill in the details.
Qualities	<ul style="list-style-type: none"> - The complaint form must be intuitive and easy to fill out.

4. Check Status (User)

Attribute	Description
Name	Check Complaint Status
Participating Actors	User
Goals	To allow users to check the status of their filed complaints.
Triggers	User navigates to the complaint status section.
Pre-Condition	<ul style="list-style-type: none"> - The user is logged in. - Complaints exist in the system.
Post-Condition	The system displays the status of the user's complaints as resolved or unresolved.
Basic Flow	<ol style="list-style-type: none"> 1. User selects "Check Complaint Status." 2. System retrieves all complaints filed by the user. 3. Status is displayed.
Alternate Flow	<ul style="list-style-type: none"> - If no complaints exist, the system displays "No Complaints Filed."
Exceptions	<ul style="list-style-type: none"> - If complaint data is unavailable due to server issues, an error message is shown.
Qualities	<ul style="list-style-type: none"> - The system should retrieve and display the status quickly.

5. Update Status (Driver)

Attribute	Description
Name	Update Status
Participating Actors	Driver
Goals	To allow the driver to update their availability status.
Triggers	The driver selects "Update Status" from their dashboard.
Pre-Condition	- The driver is logged in.
Post-Condition	Availability status is updated in the system.
Basic Flow	<ol style="list-style-type: none"> 1. Driver selects "Update Status." 2. Driver toggles their status. 3. System updates and saves the status.
Alternate Flow	- None.
Exceptions	- If the update fails, the system displays an error message.
Qualities	- Status updates must reflect immediately in the system.

6. Share Live Location (Driver)

Attribute	Description
Name	Share Live Location
Participating Actors	Driver
Goals	To allow the driver to share their live location with the system for real-time tracking by users and admin.
Triggers	Driver enables location sharing from their dashboard.
Pre-Condition	<ul style="list-style-type: none"> - Driver is logged into the system. - The device's GPS is enabled.
Post-Condition	Driver's live location is displayed on the map for the assigned route.
Basic Flow	<ol style="list-style-type: none"> 1. Driver selects "Share Live Location." 2. System fetches and updates location data periodically. 3. Users can view the location.
Alternate Flow	- If location sharing is disabled, the system stops fetching updates and shows the last known location.
Exceptions	- If GPS is disabled, the system displays an error and prompts the driver to enable it.
Qualities	- Location updates must be frequent and accurate.

7. Manage Complaints (Admin)

Attribute	Description
Name	Manage Complaints
Participating Actors	Admin
Goals	To allow the admin to review, update, and resolve user complaints.
Triggers	Admin navigates to the complaint management section.
Pre-Condition	<ul style="list-style-type: none"> - Admin is logged in. - Complaints exist in the system.
Post-Condition	Complaints are resolved or updated in the system.
Basic Flow	<ol style="list-style-type: none"> 1. Admin selects a complaint from the list. 2. Admin reviews the details. 3. Admin updates the status (e.g., resolved).
Alternate Flow	- If no action is required, the admin can leave the complaint unresolved.
Exceptions	- If the complaint data is corrupted, the system displays an error.
Qualities	- The complaint list must be easy to search and filter.

8. Assign Drivers/Routes (Admin)

Attribute	Description
Name	Assign Drivers/Routes
Participating Actors	Admin
Goals	To allow the admin to assign drivers to specific buses/routes.
Triggers	Admin navigates to the driver or route assignment section.
Pre-Condition	<ul style="list-style-type: none"> - Admin is logged in. - Drivers and routes exist in the system.
Post-Condition	The driver is assigned to a specific route in the system.
Basic Flow	<ol style="list-style-type: none"> 1. Admin selects a driver. 2. Admin selects a route. 3. System updates the assignment.
Alternate Flow	- If a driver is unavailable, the admin chooses another driver.
Exceptions	- If no drivers or routes exist, the system displays an error.
Qualities	- The assignment interface must allow bulk updates.

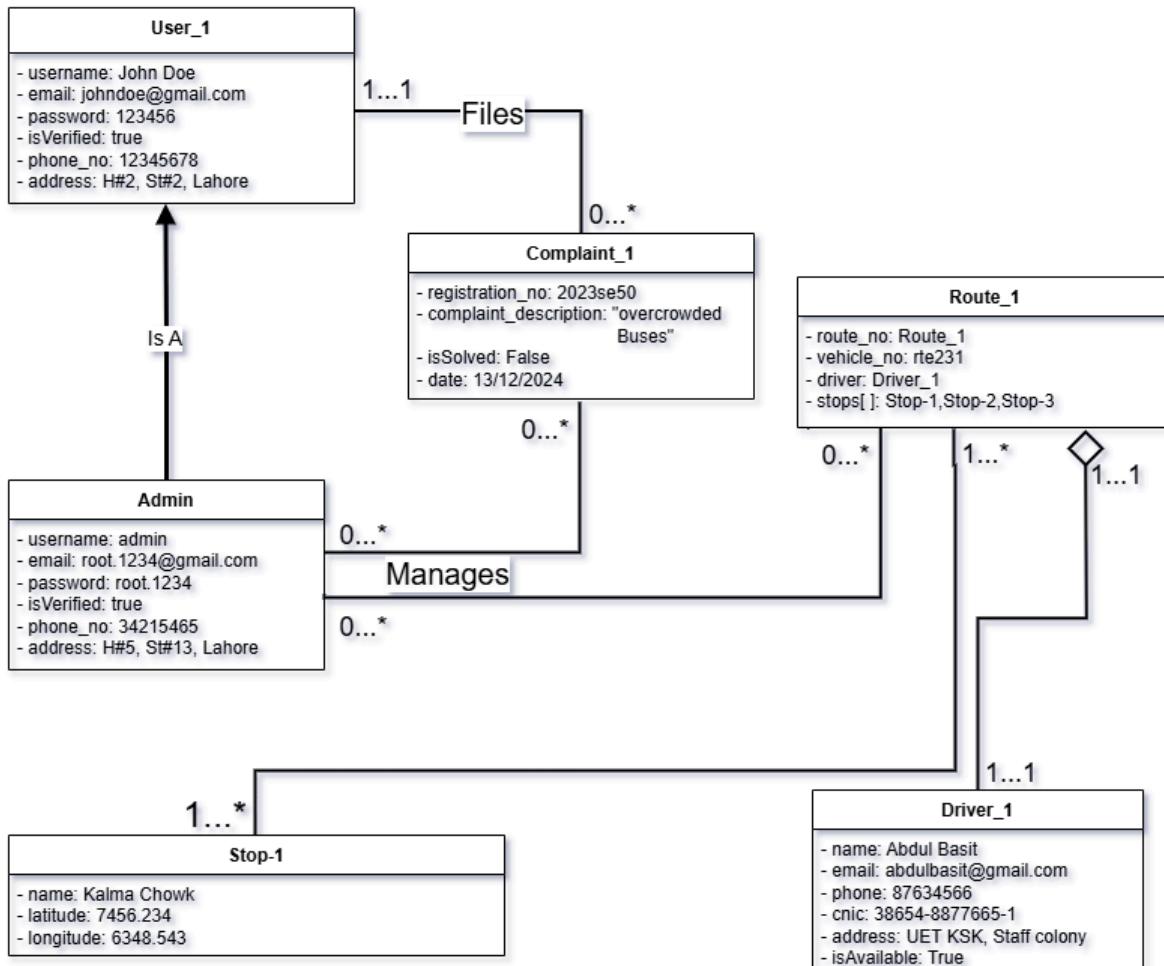
9. Manage Routes (Admin)

Attribute	Description
Name	Manage Routes
Participating Actors	Admin
Goals	To allow the admin to add, update, or delete bus routes in the system.
Triggers	Admin selects the route management option.
Pre-Condition	- Admin is logged in.
Post-Condition	The route database is updated based on admin actions.
Basic Flow	<ol style="list-style-type: none"> 1. Admin navigates to the route list. 2. Admin performs actions such as add, update, or delete. 3. System saves changes.
Alternate Flow	- If no changes are made, the admin exits the section without updates.
Exceptions	- If route data is invalid, the system displays an error.
Qualities	- Changes must be validated before being saved.

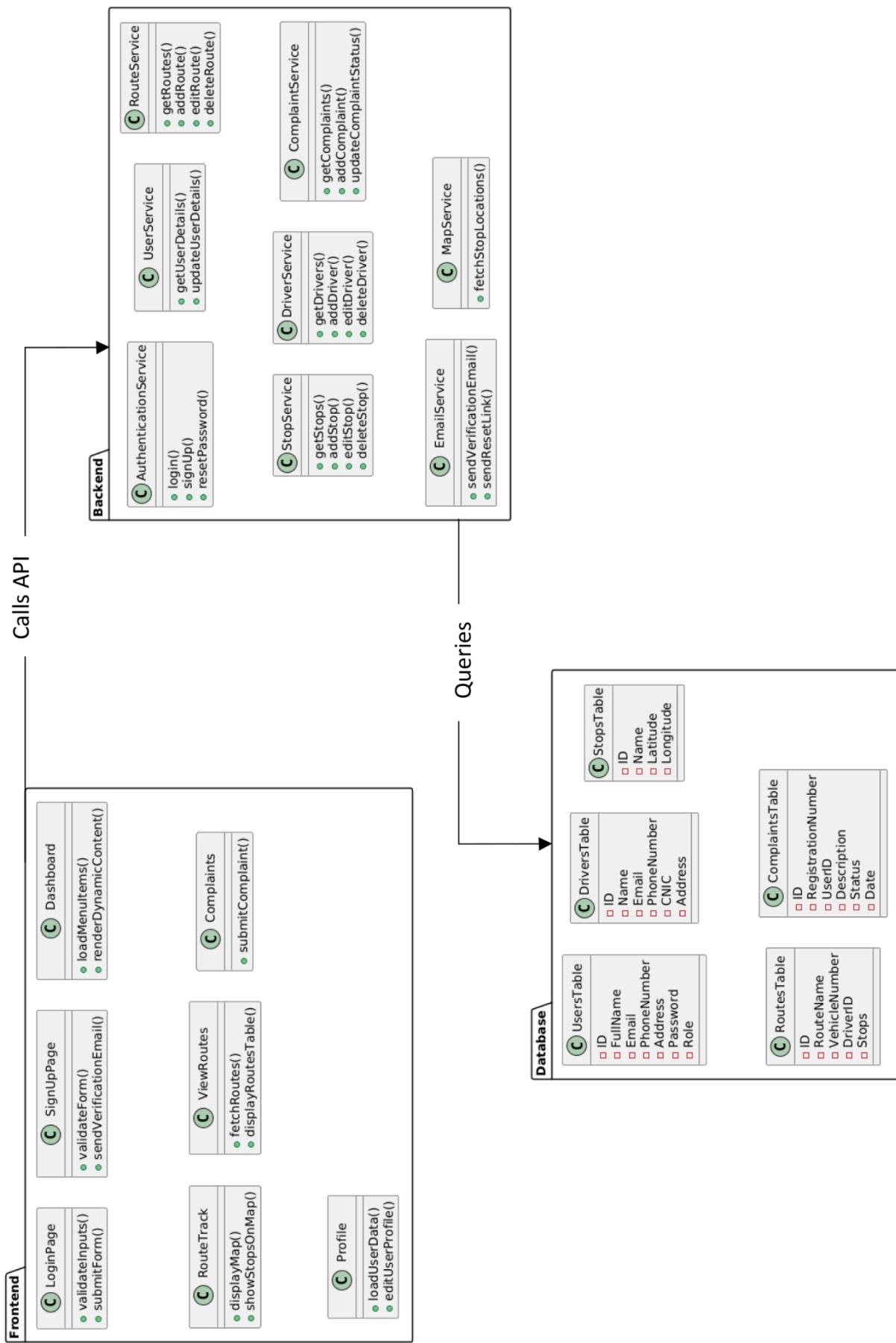
10. Manage Drivers (Admin)

Attribute	Description
Name	Manage Drivers
Participating Actors	Admin
Goals	To allow the admin to add, update, or remove driver records.
Triggers	Admin selects the driver management option.
Pre-Condition	- Admin is logged in.
Post-Condition	The driver database is updated based on admin actions.
Basic Flow	<ol style="list-style-type: none"> 1. Admin navigates to the driver list. 2. Admin performs actions such as add, update, or remove. 3. System saves changes.
Alternate Flow	- If no changes are made, the admin exits the section without updates.
Exceptions	- If driver data is invalid, the system displays an error.
Qualities	- The interface must ensure accurate data entry and validation.

OBJECT DIAGRAM

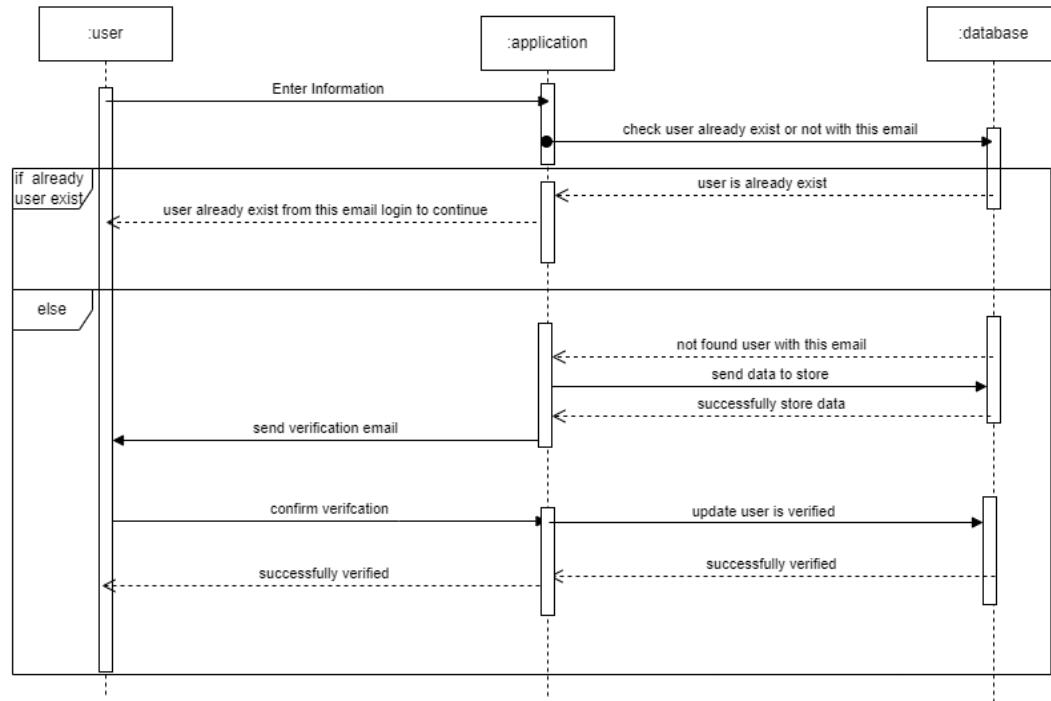


PACKAGE DIAGRAM

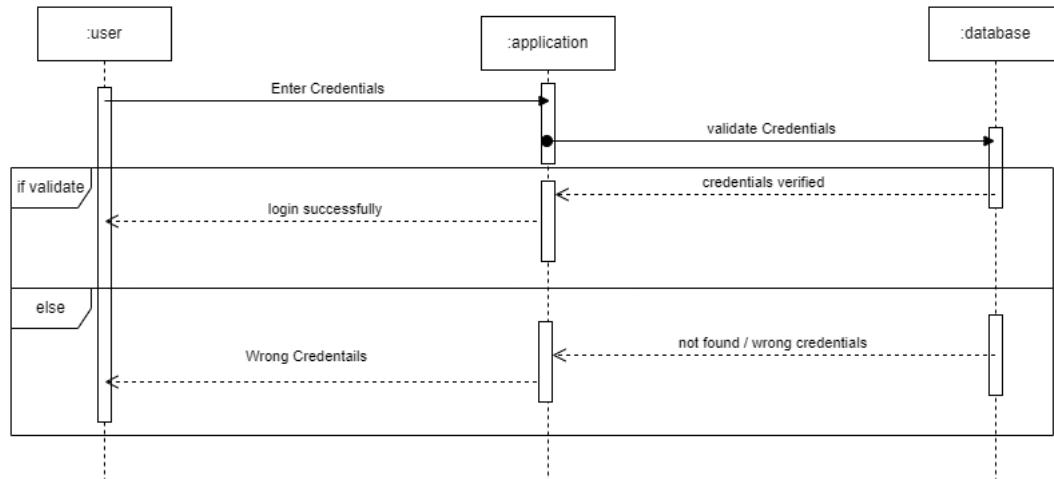


SEQUENCE DIAGRAM

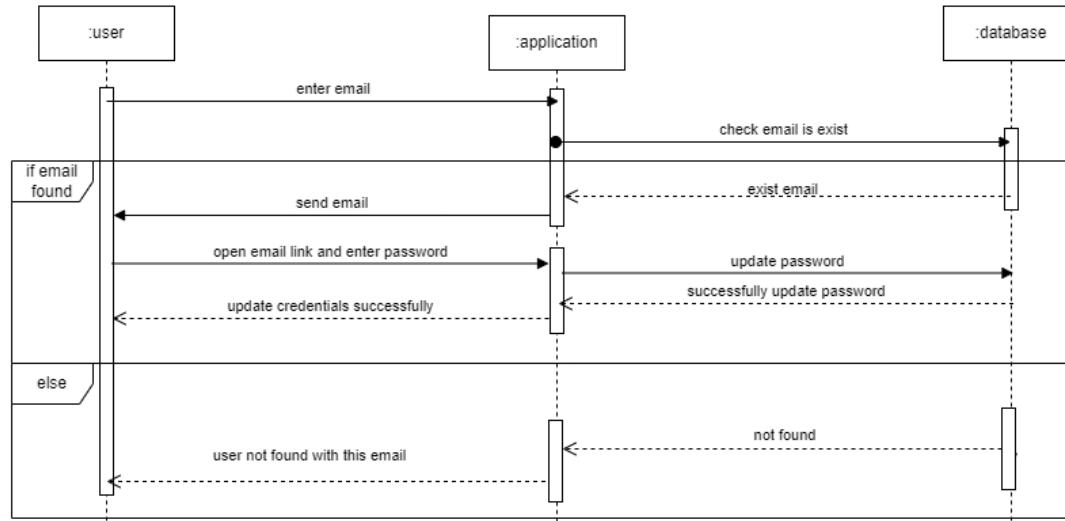
- Register



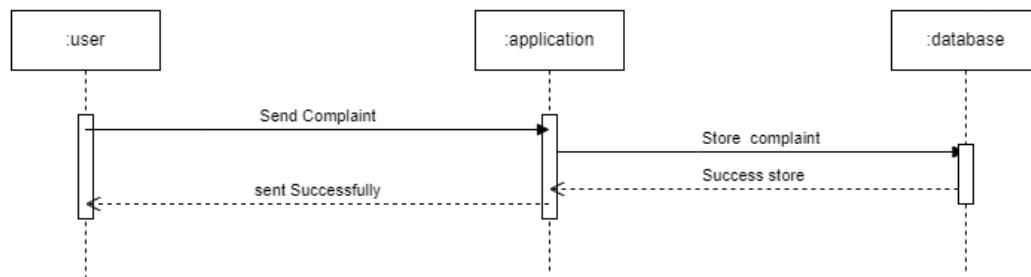
- Login



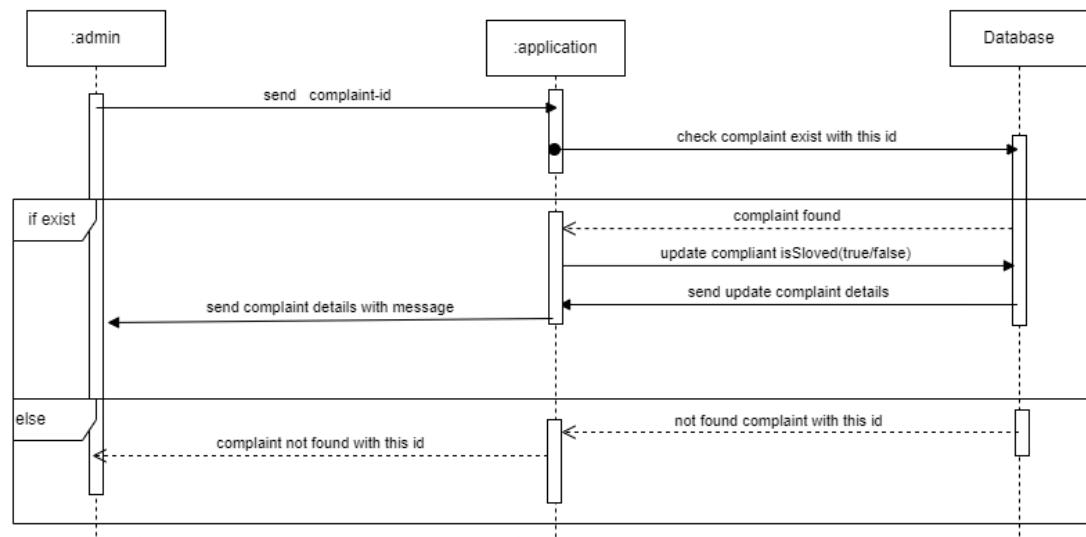
- **Forget Password:**



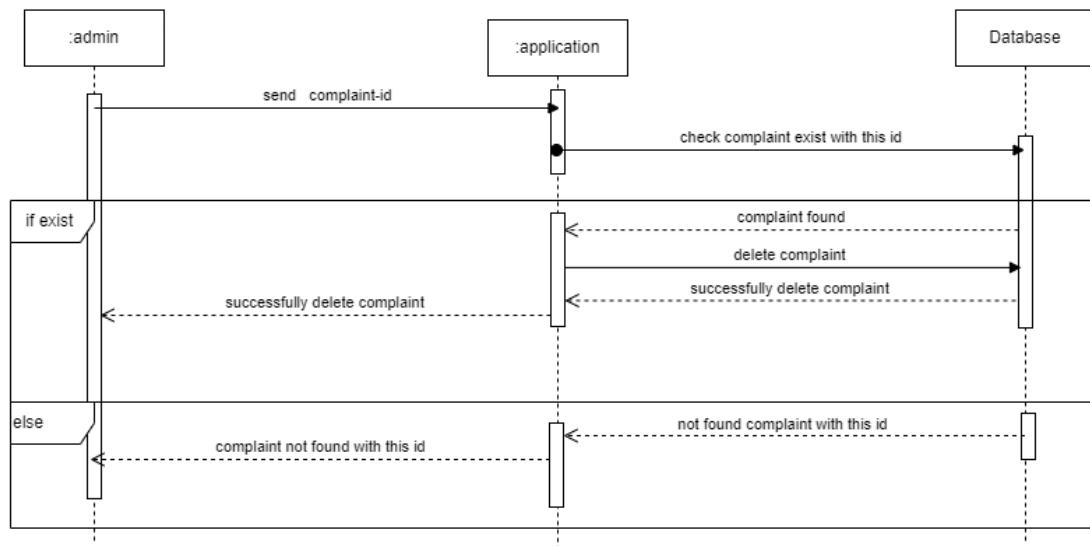
- **User Complaint:**



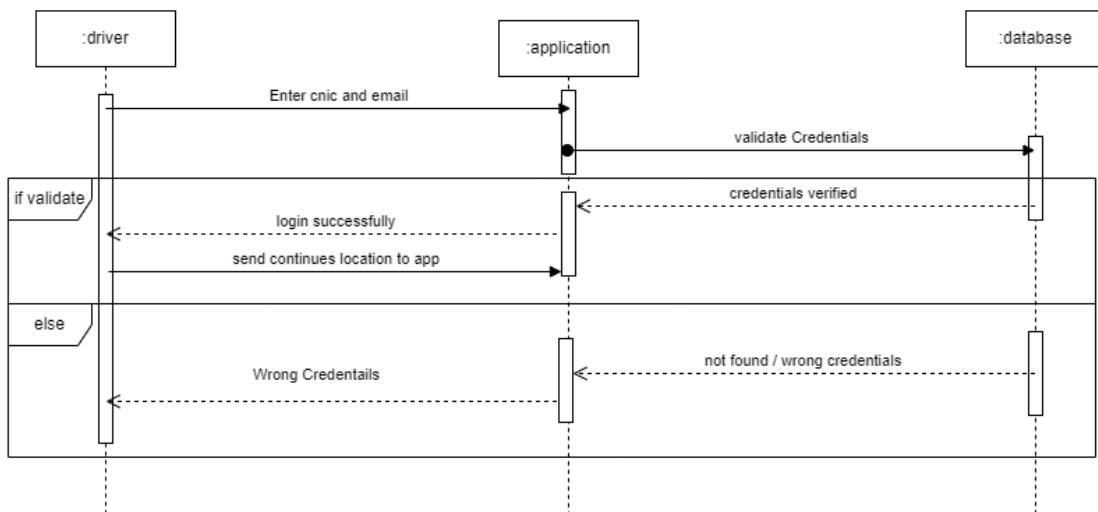
- **Update Complaint Status:**



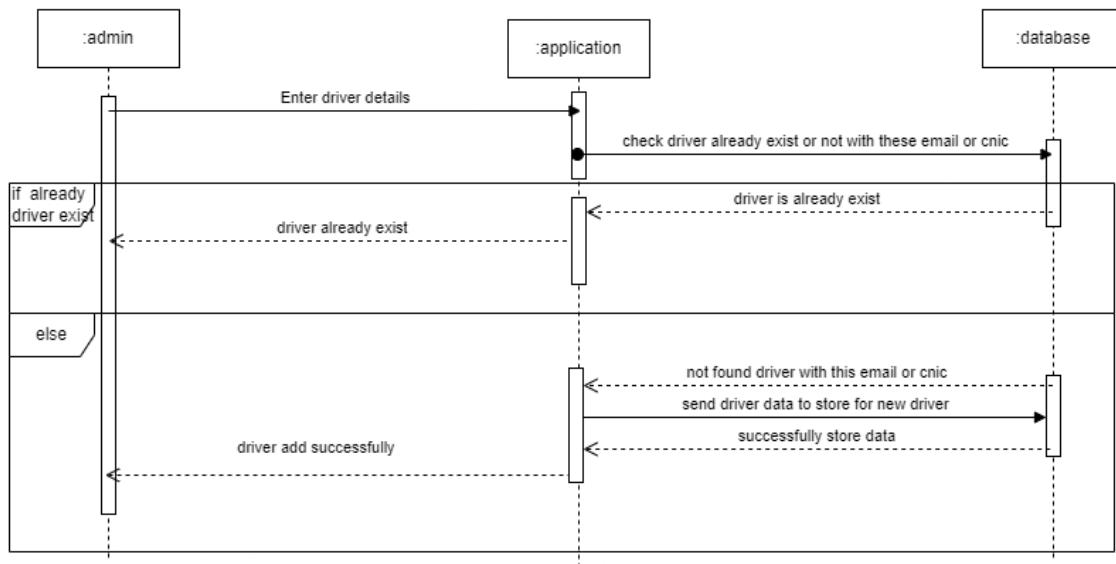
- **Delete Complaint:**



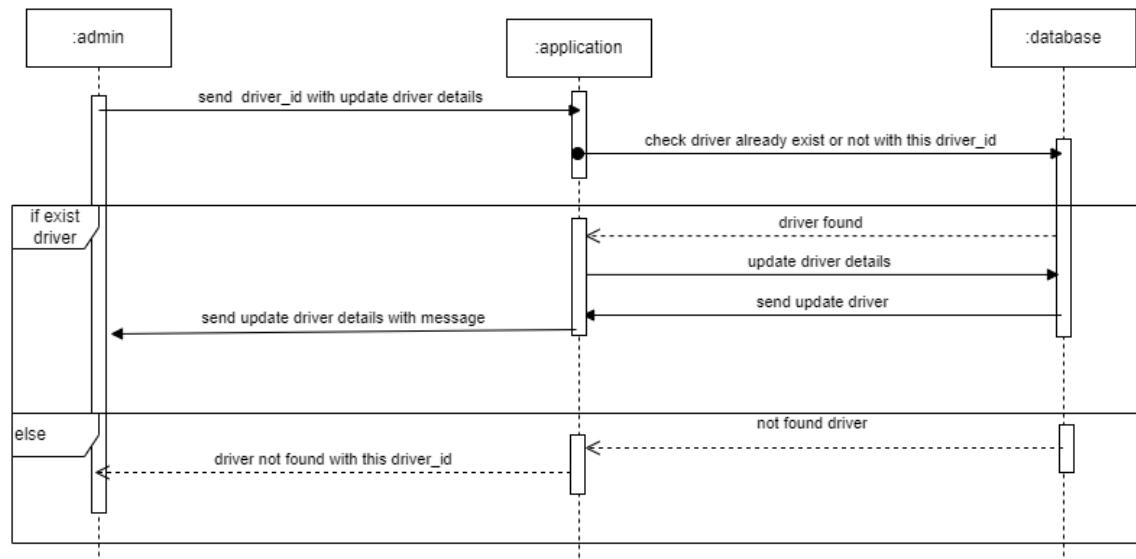
- **Driver workFlow:**



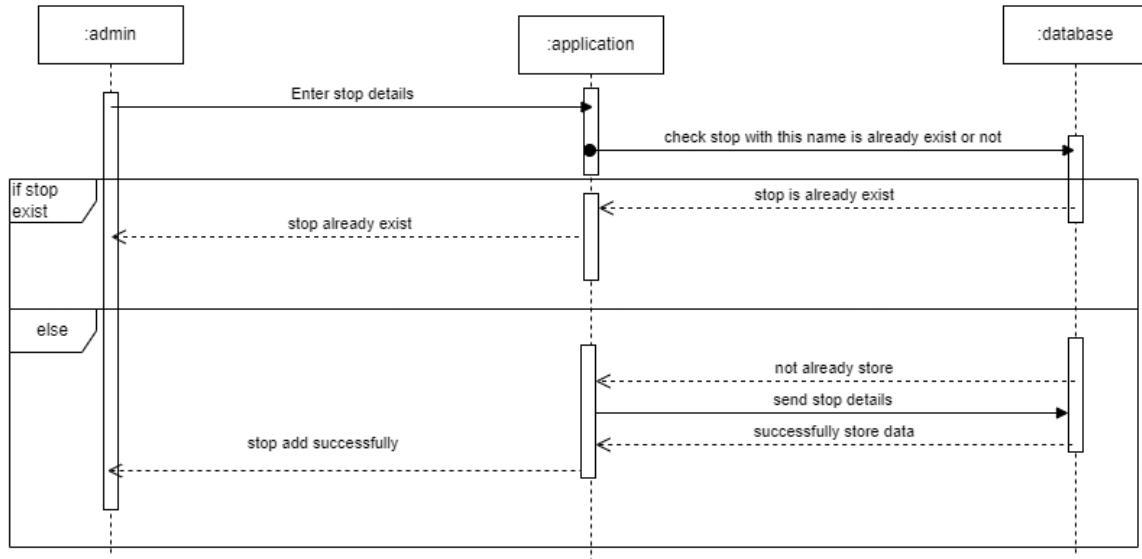
- **Add driver:**



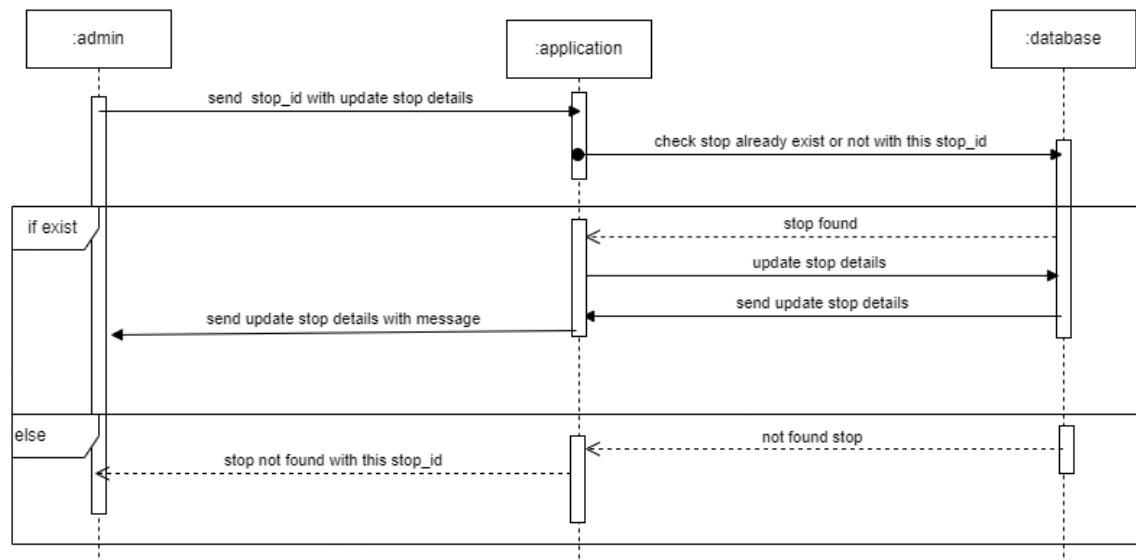
- **Update Driver:**



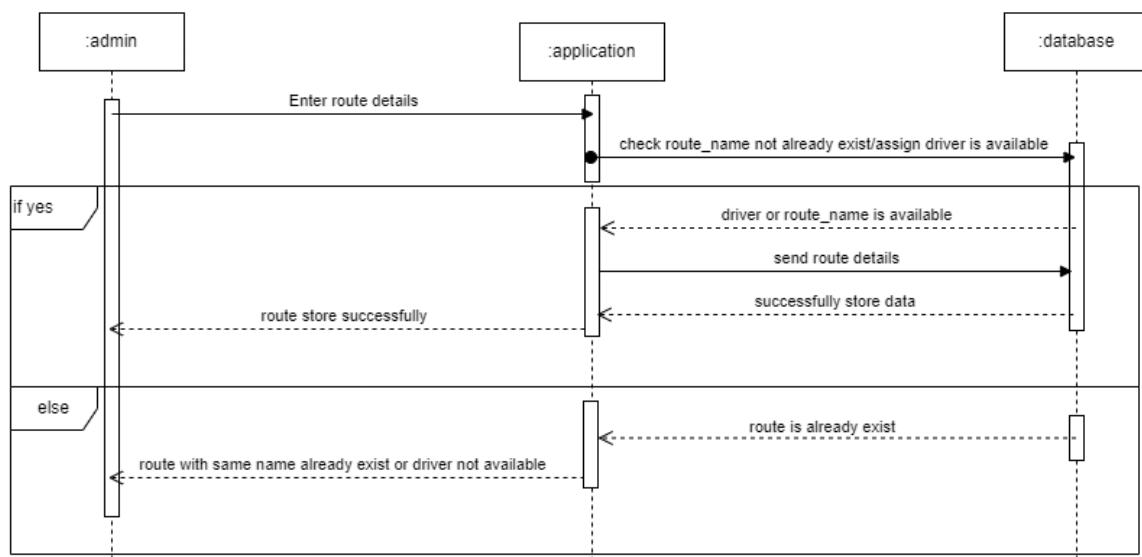
- **Add Stop:**



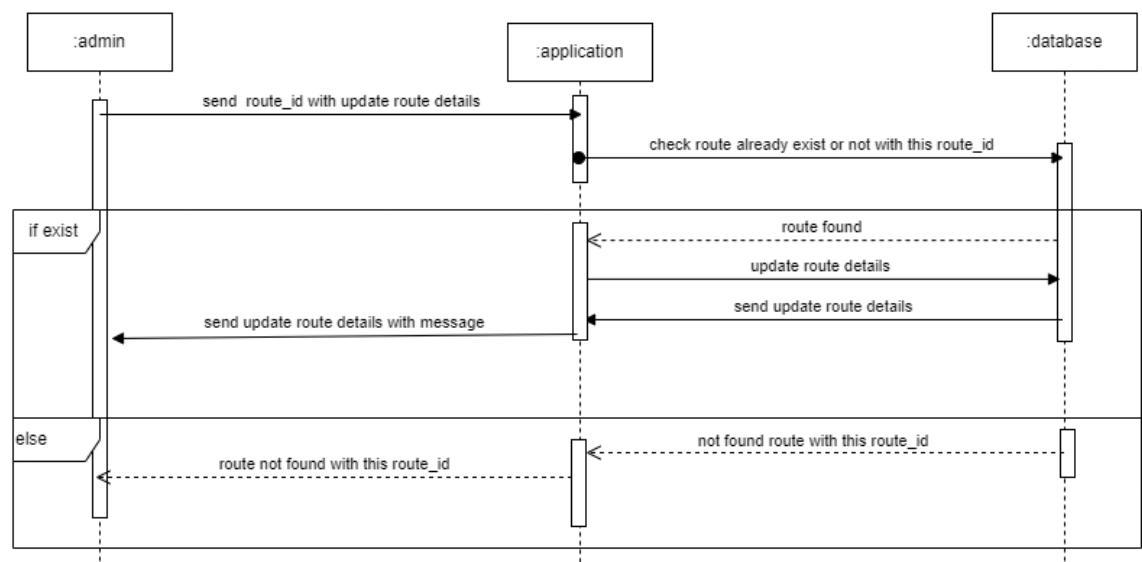
- **Update stop:**



● Add Route:

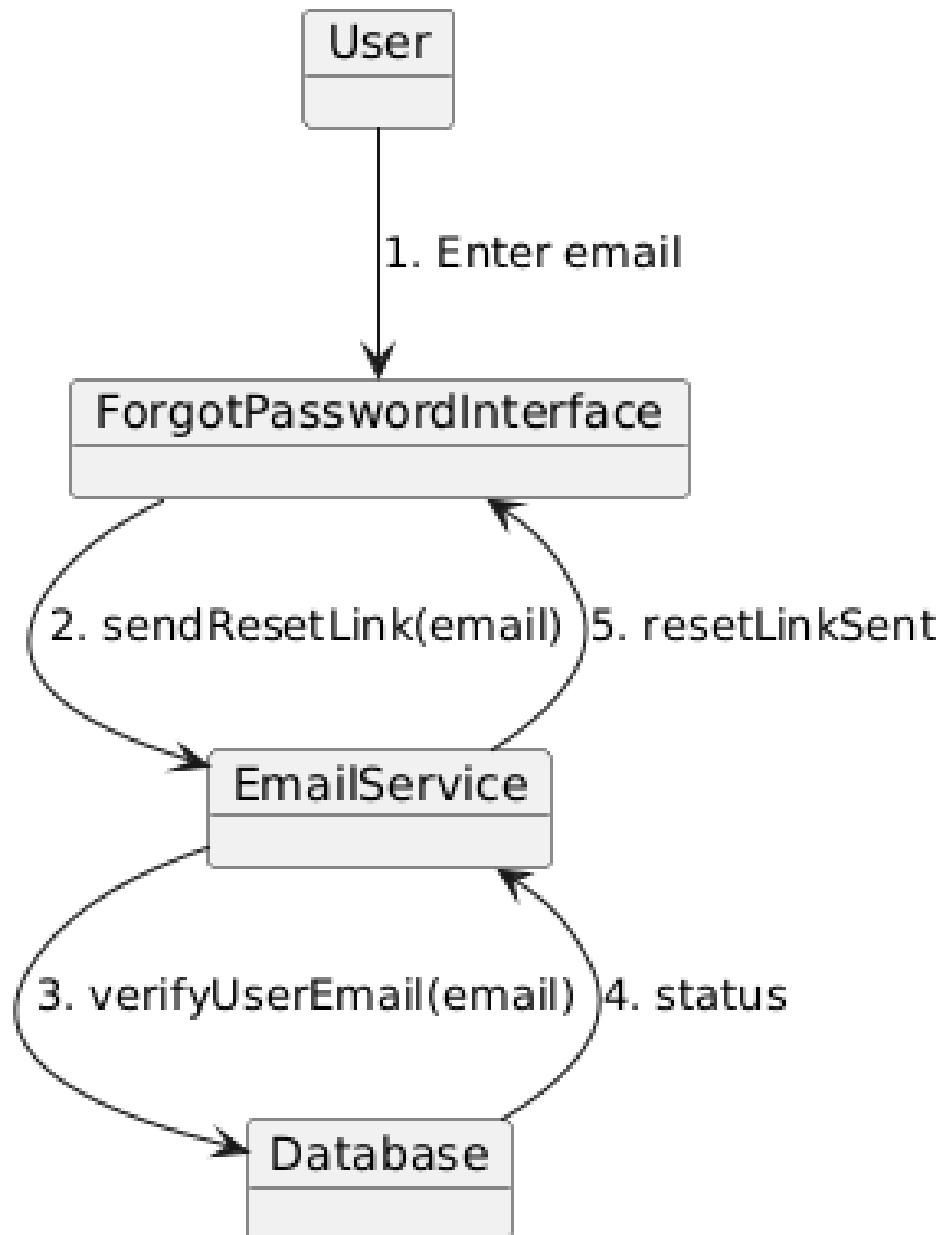


● Update Route:

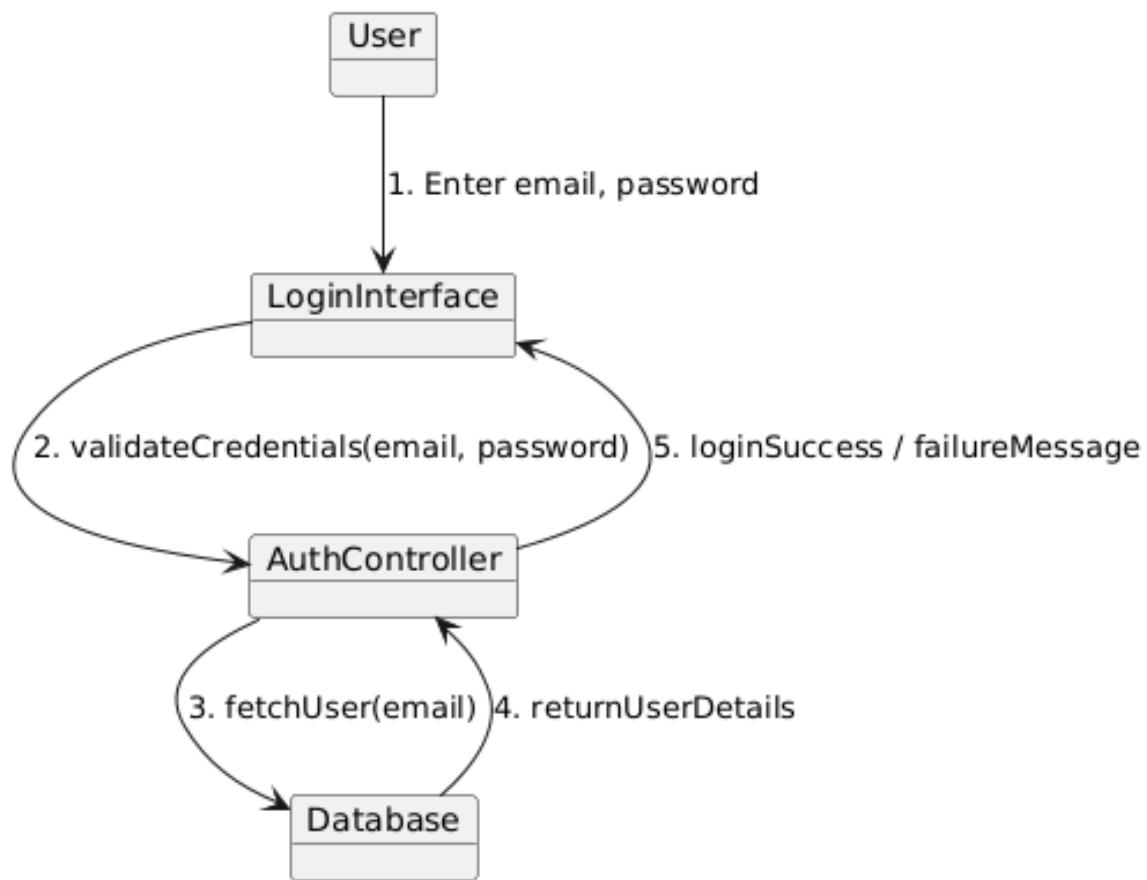


COLLABORATION / COMMUNICATION DIAGRAMS

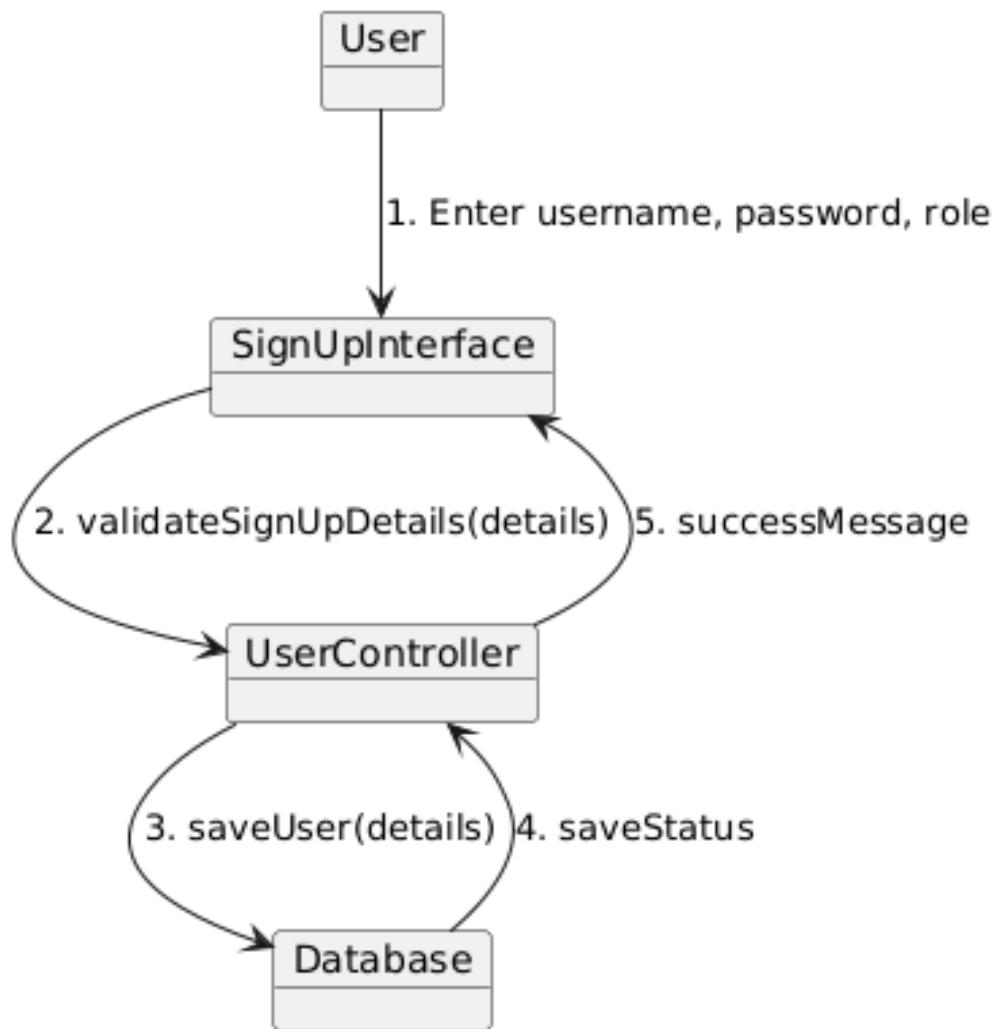
- Forget Password



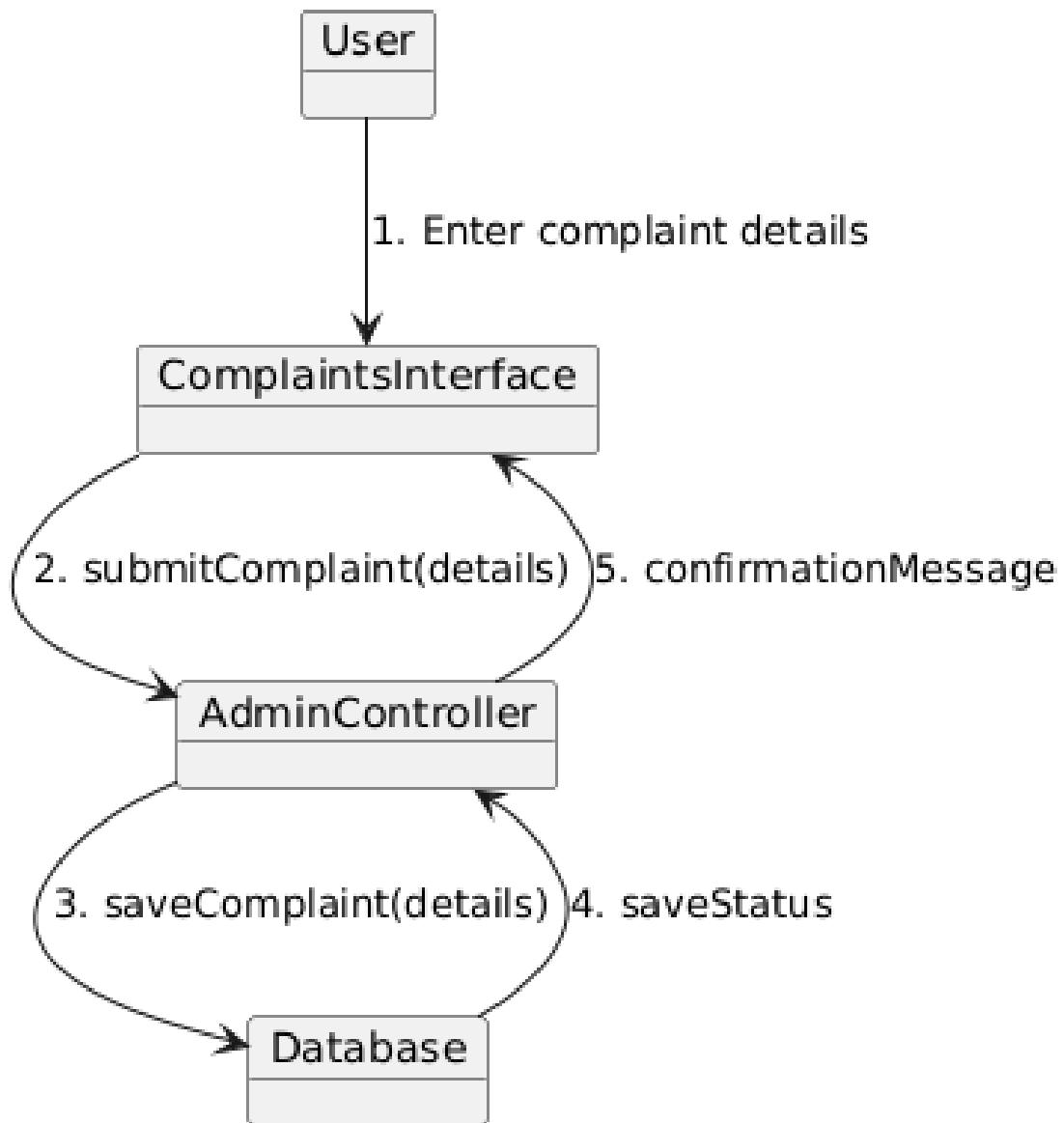
- **Login**



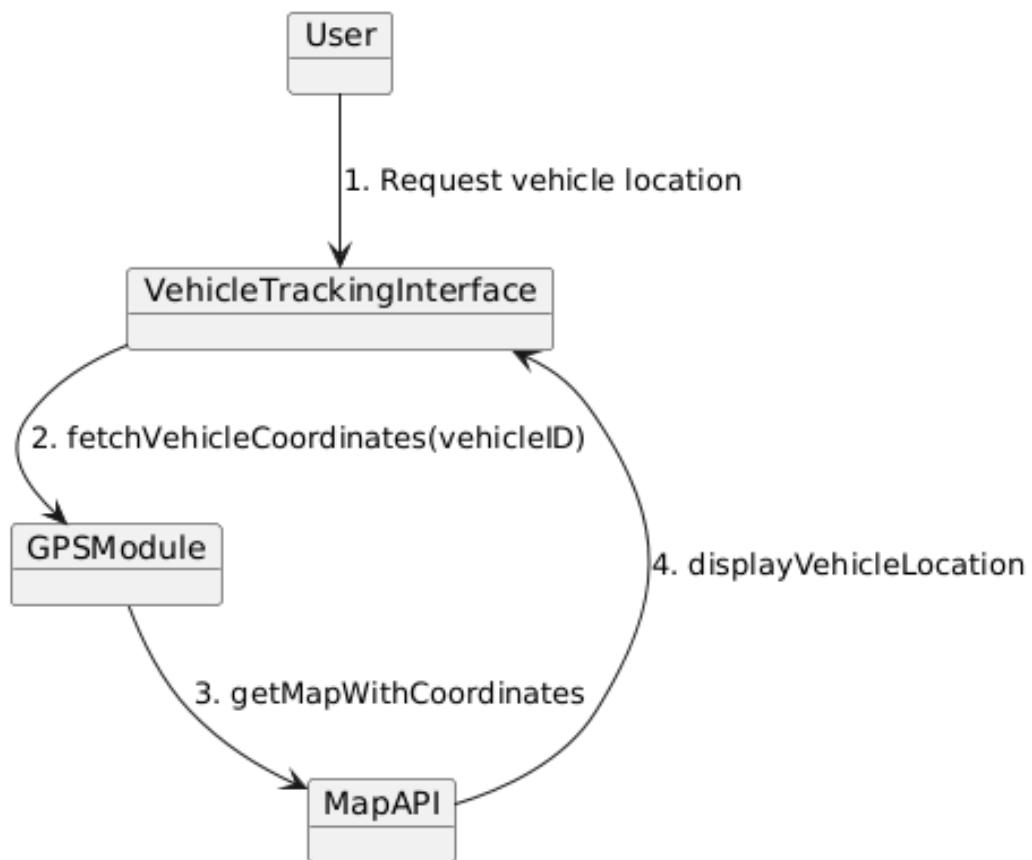
- **Sign up**



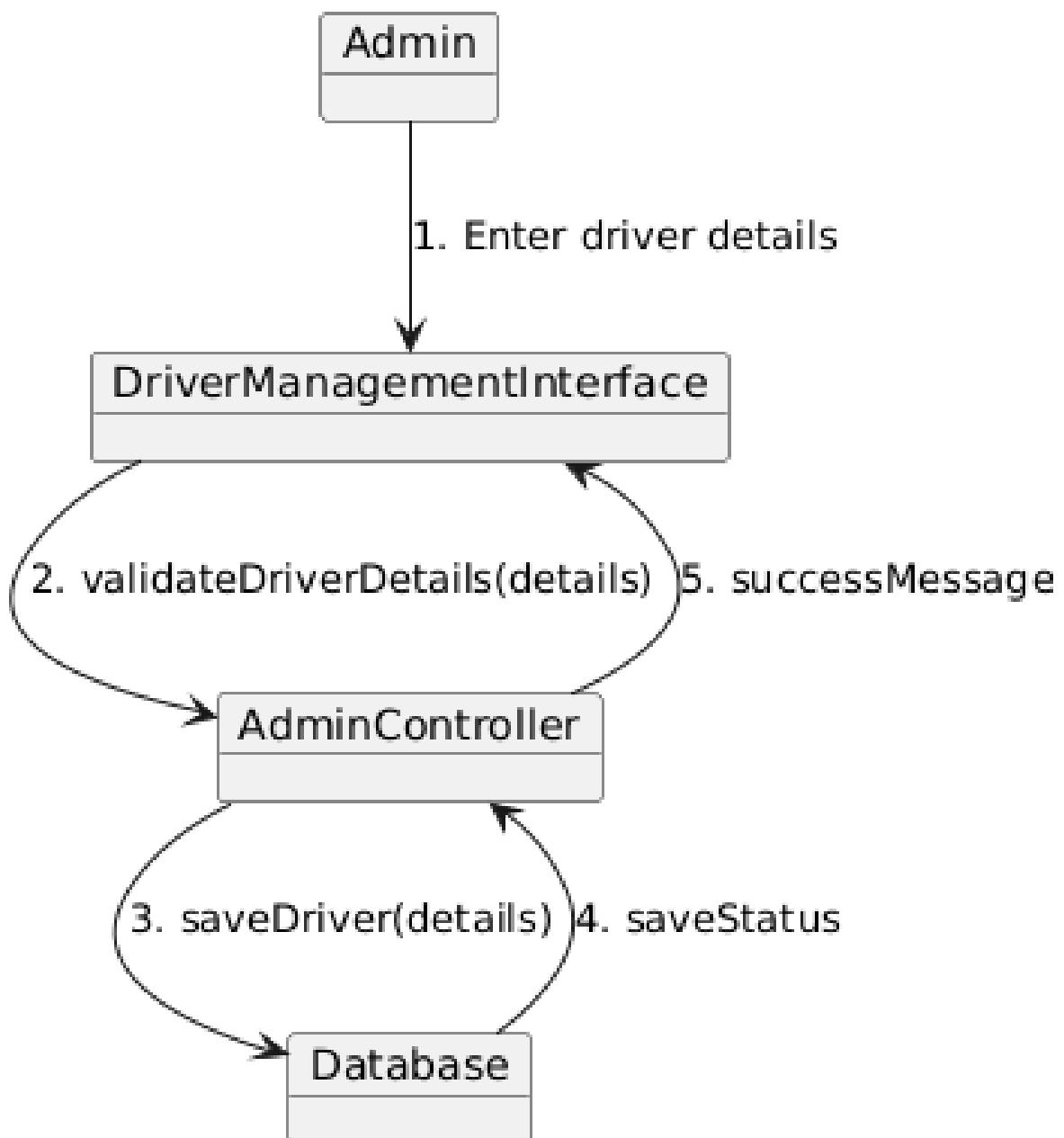
- **Submit Complaint**



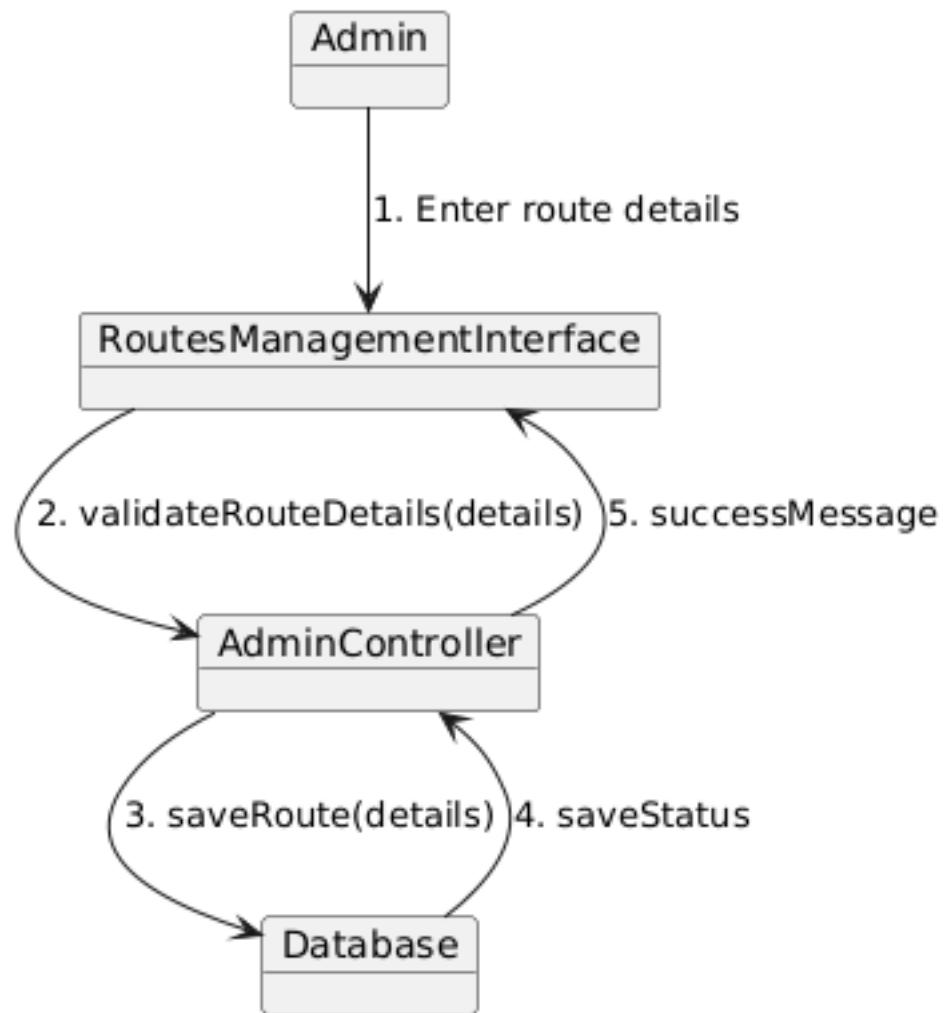
- **Route Tracking**



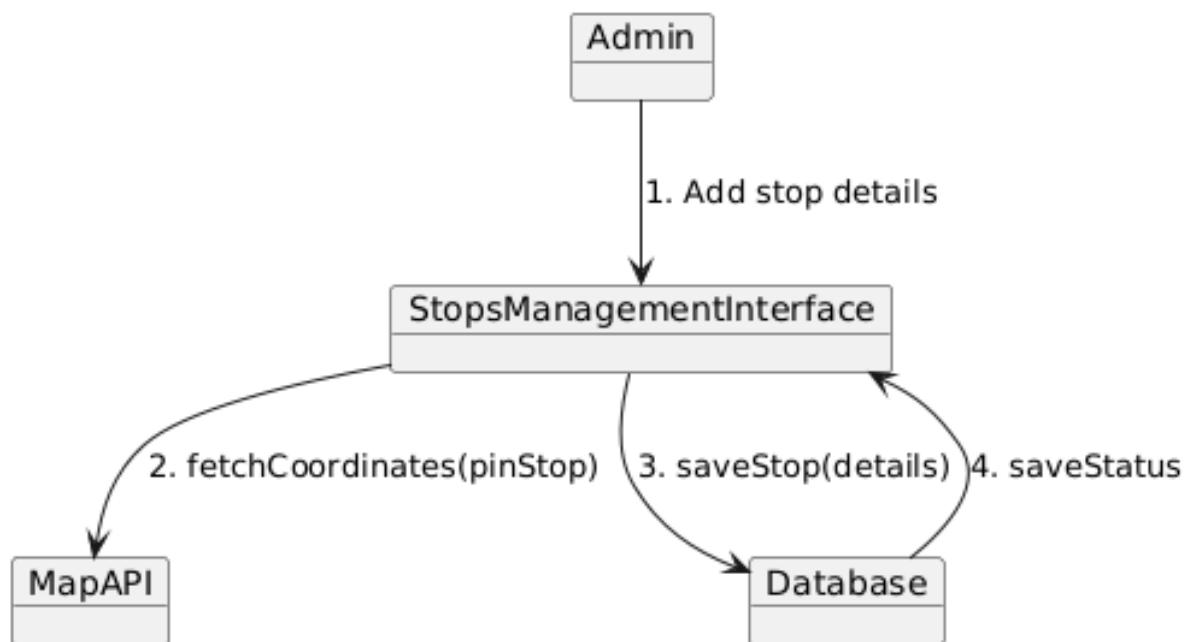
- Add Driver



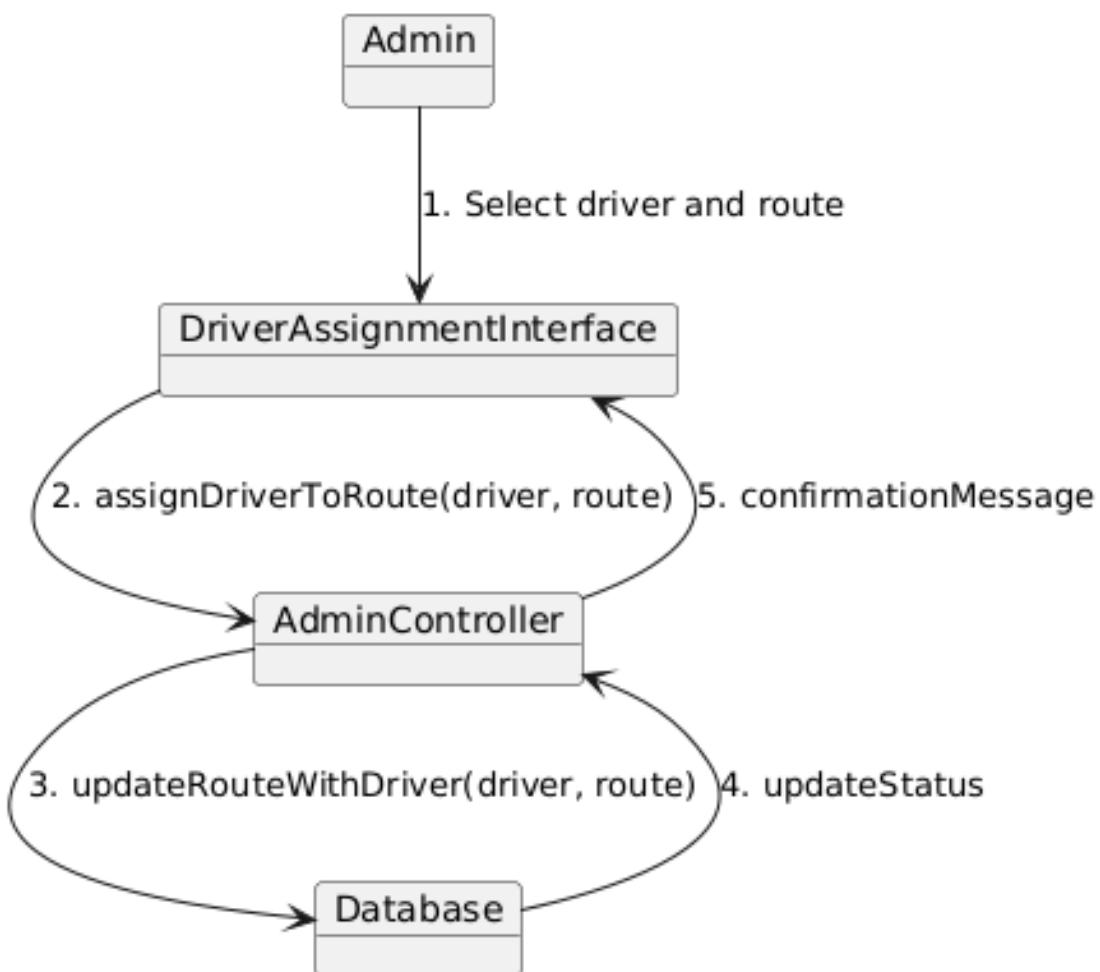
- **Add Route**



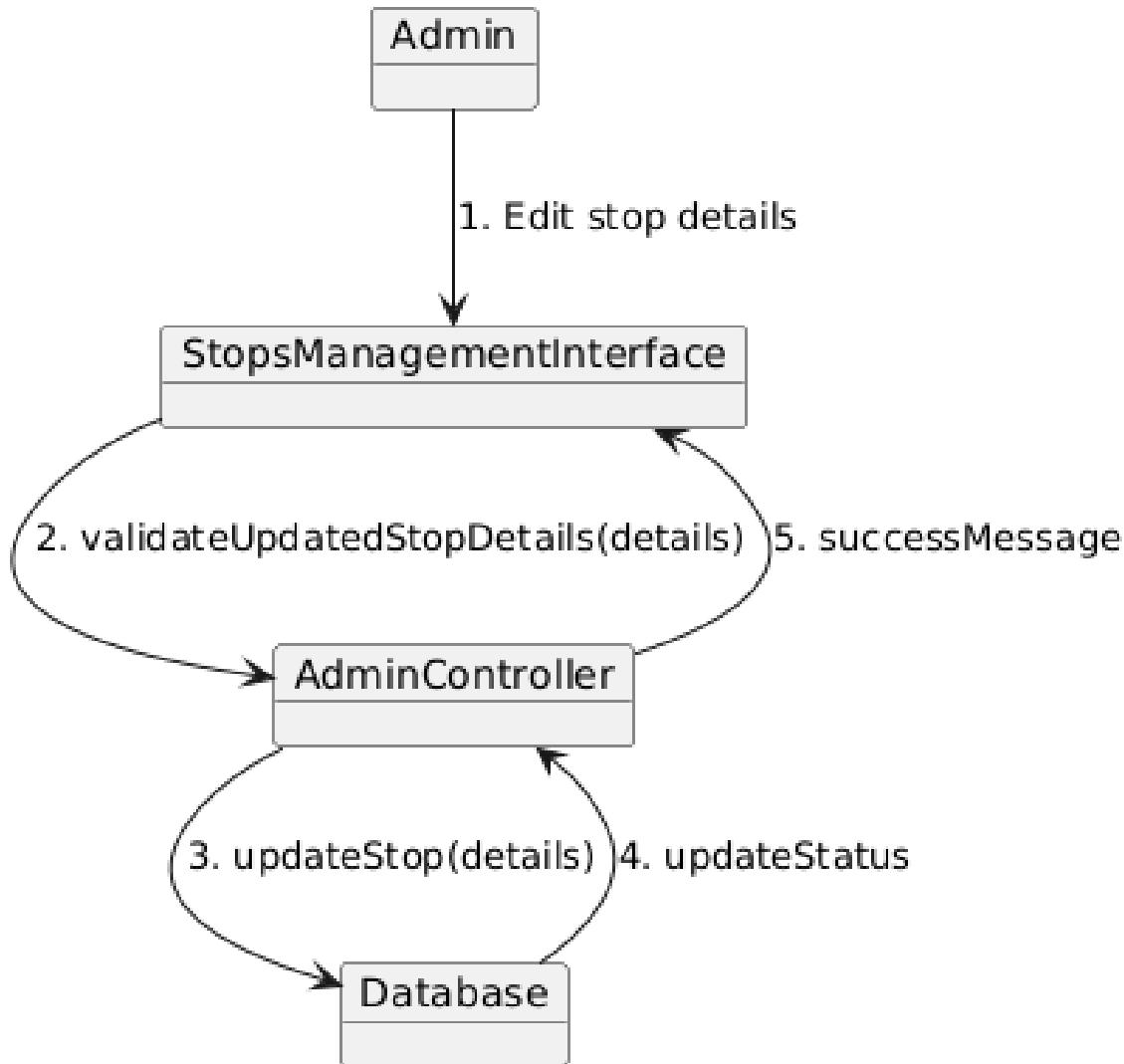
- Add Stop



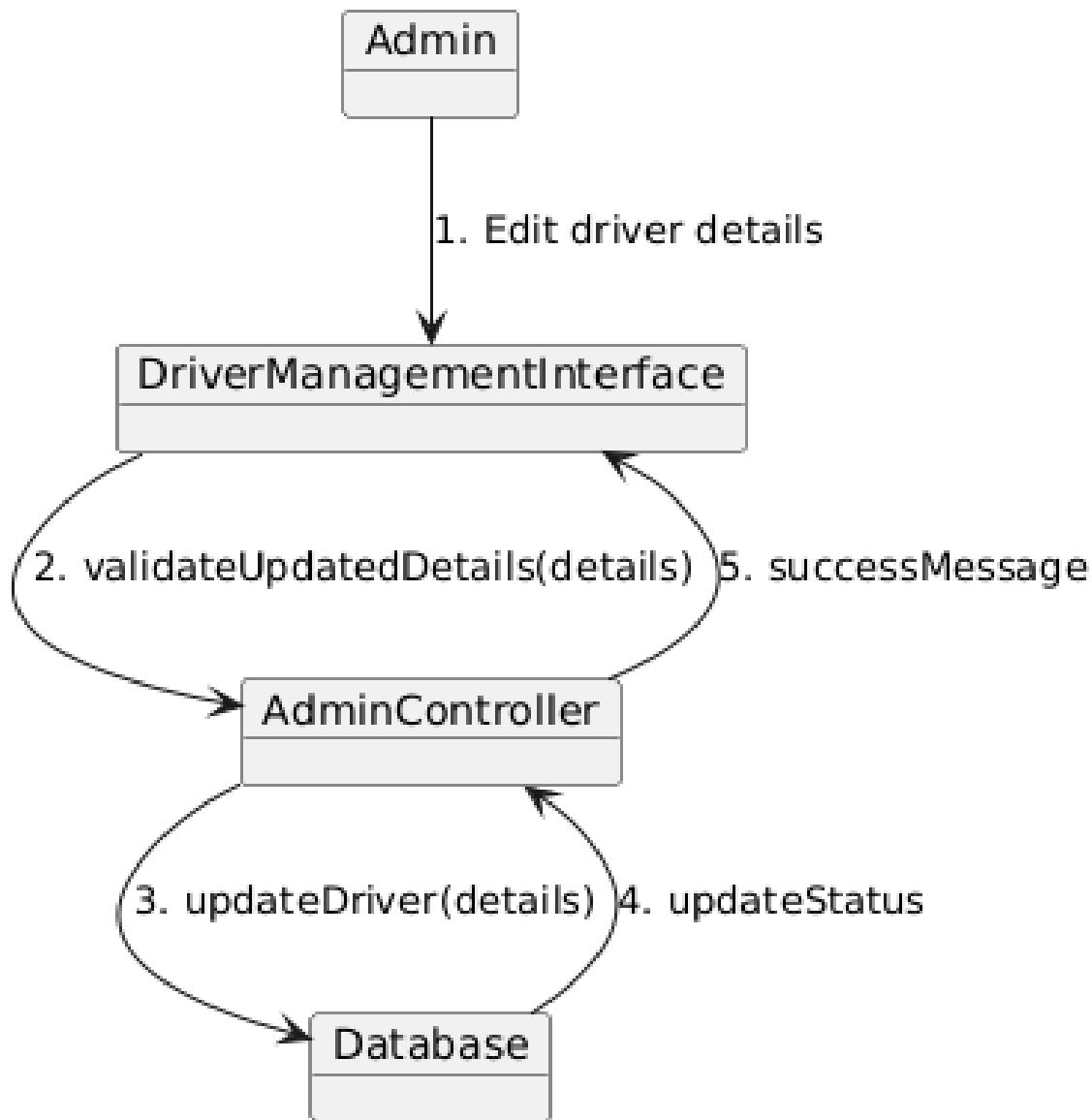
- Assign Driver to Route



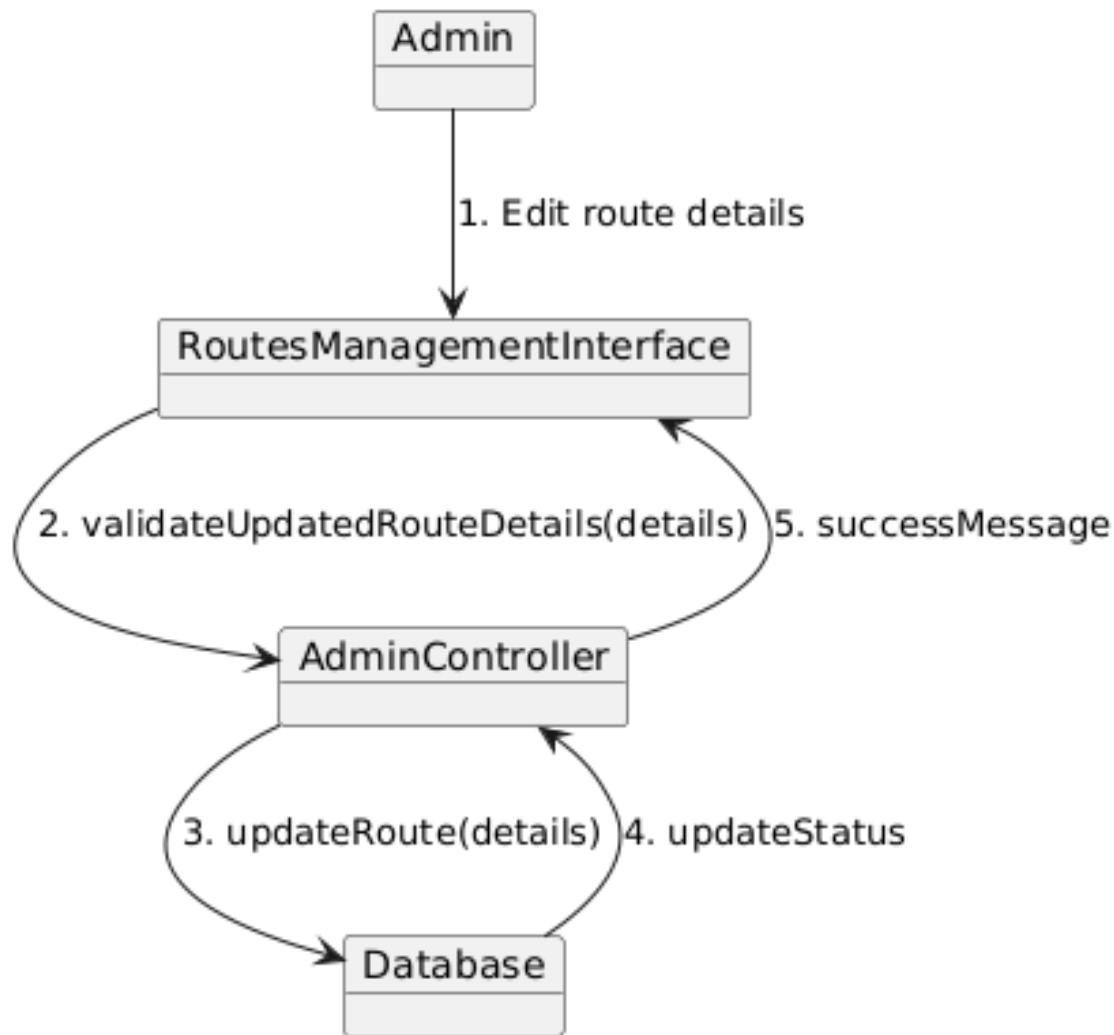
- **Edit Stop**



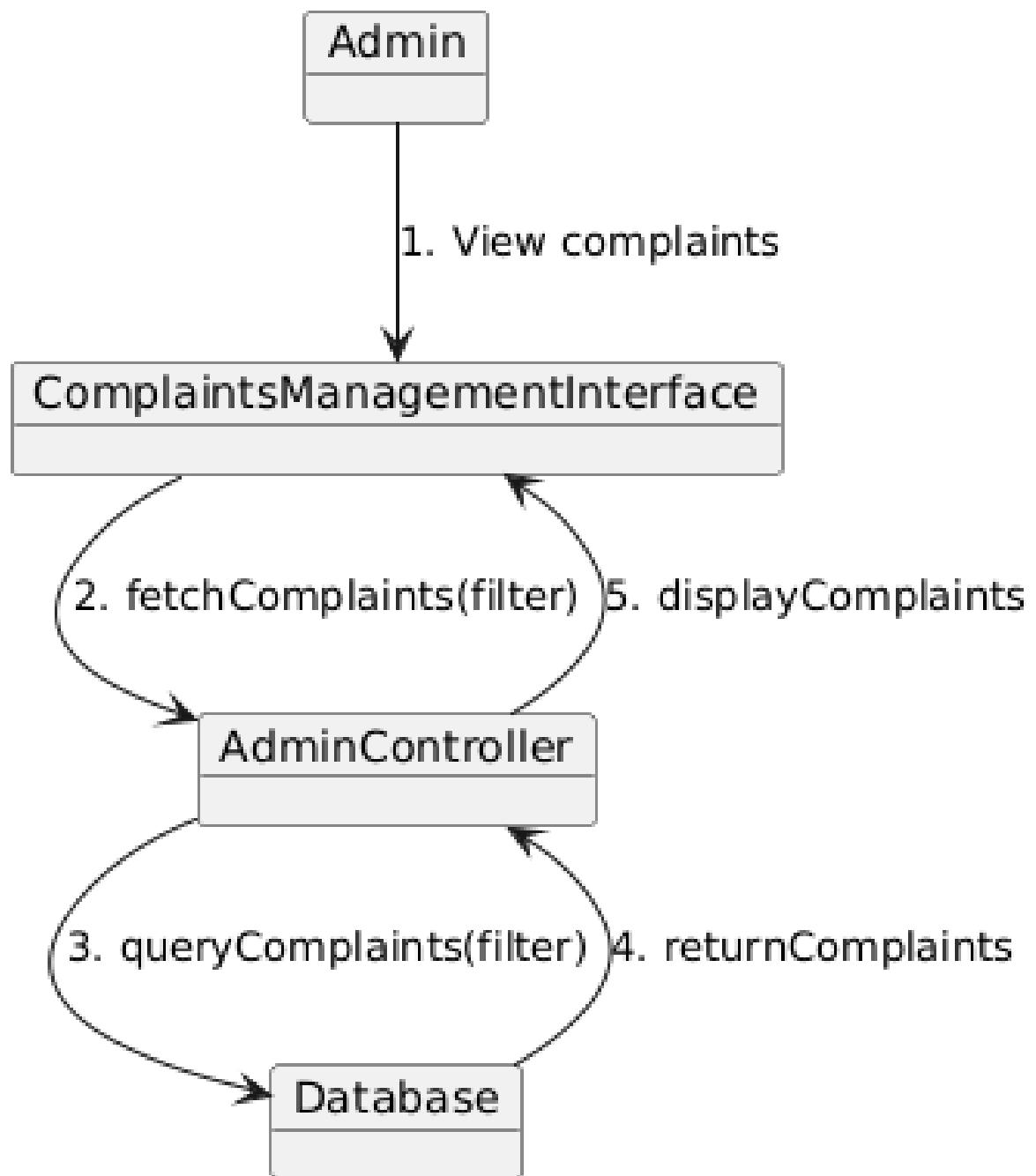
- **Update Driver**



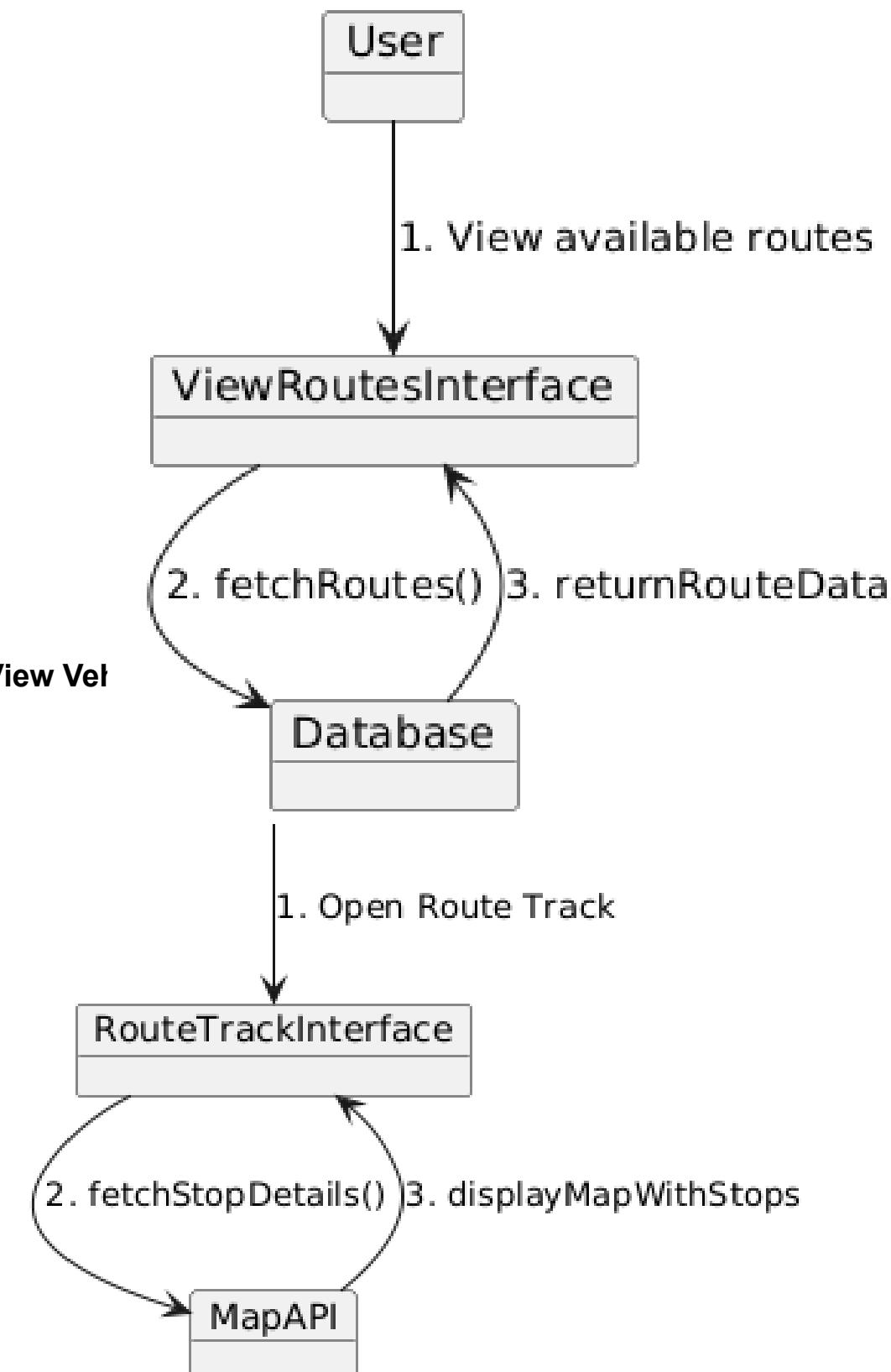
- **Update Route**



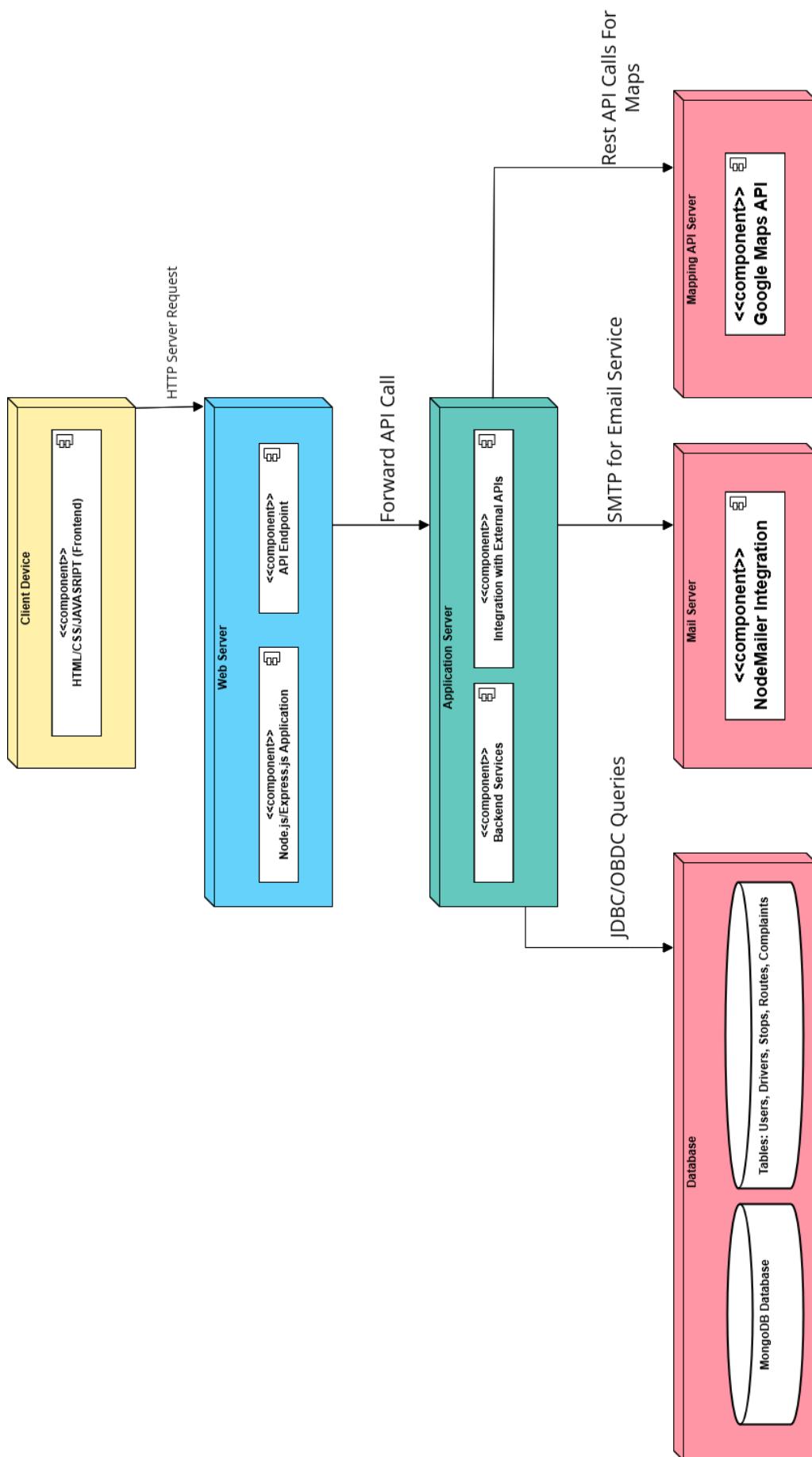
- **View Complaints**



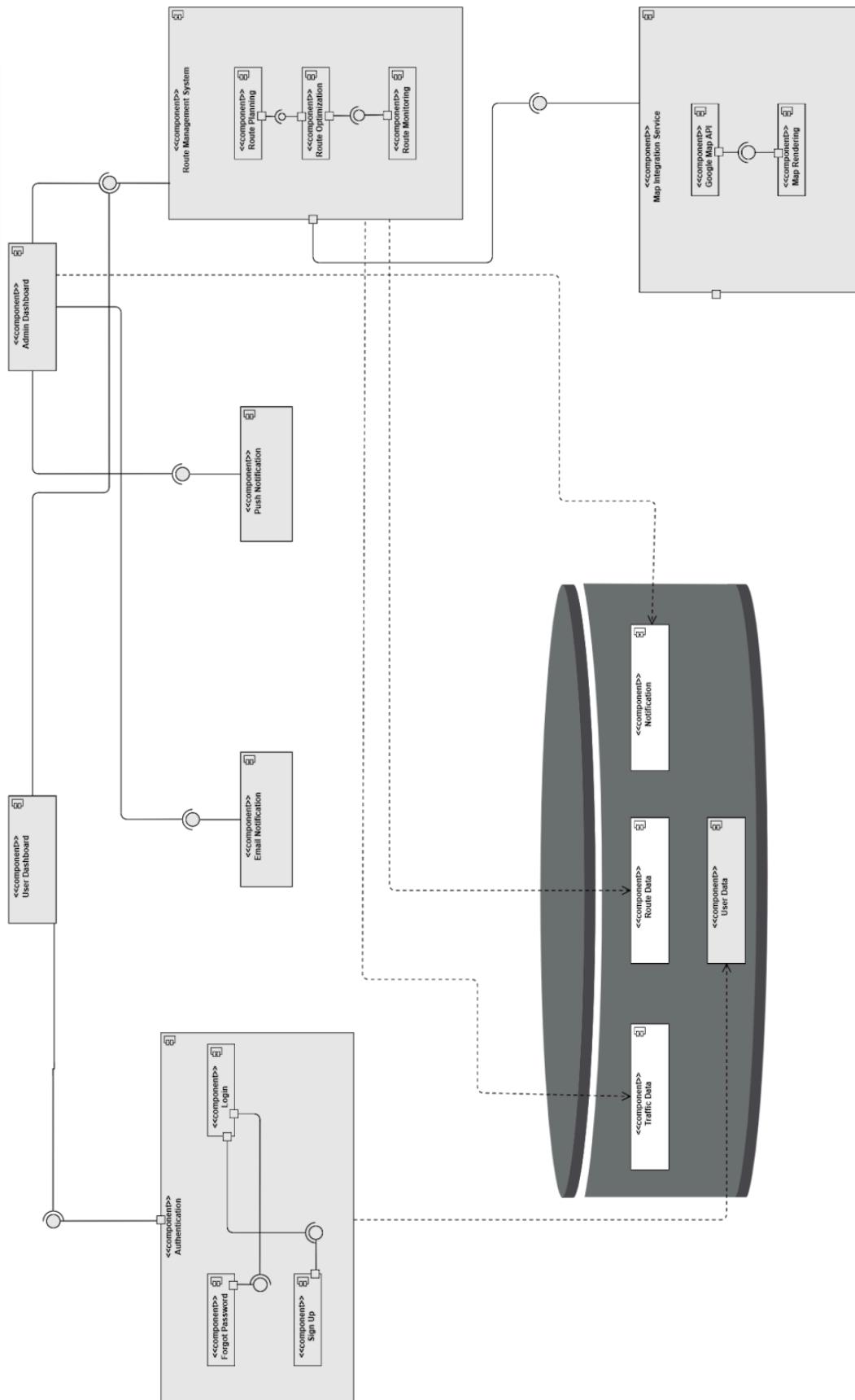
- **View Routes**



DEPLOYMENT DIAGRAM

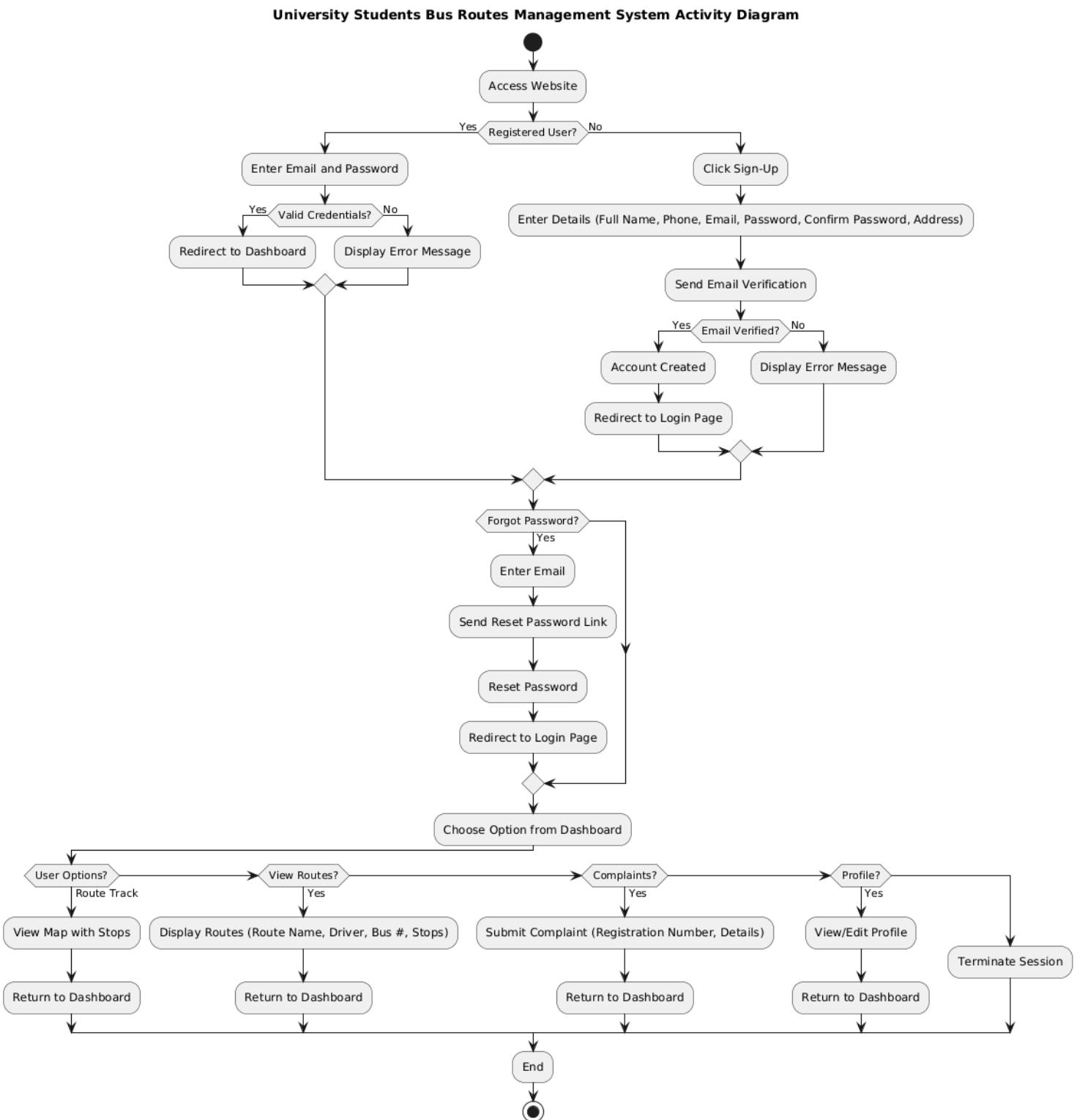


COMPONENT DIAGRAM

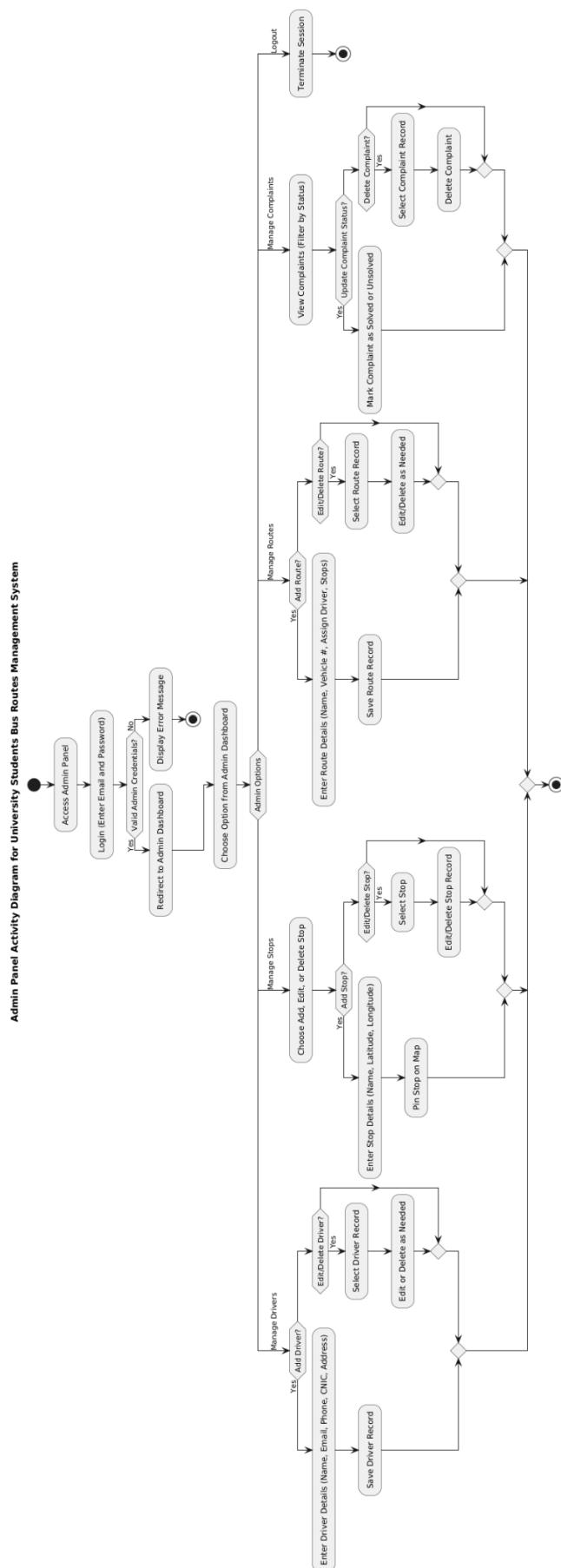


ACTIVITY DIAGRAM

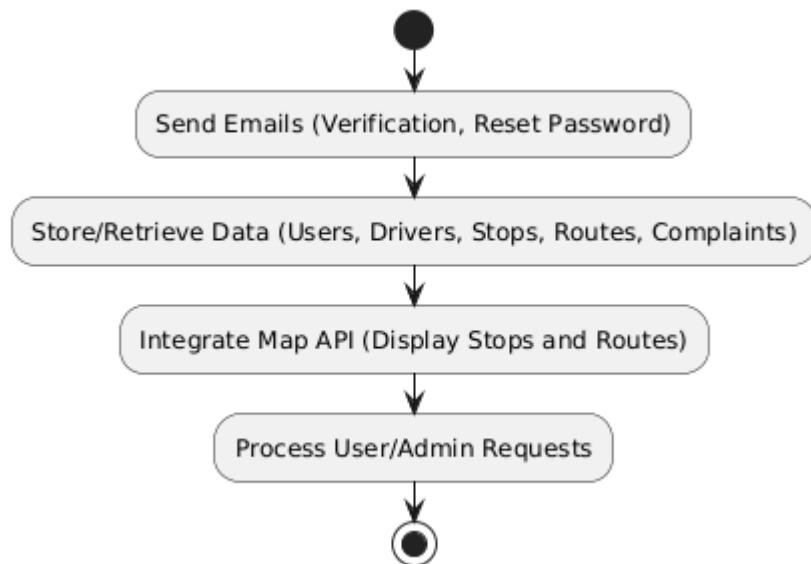
- User Activity Diagram



• Admin Activity Diagram

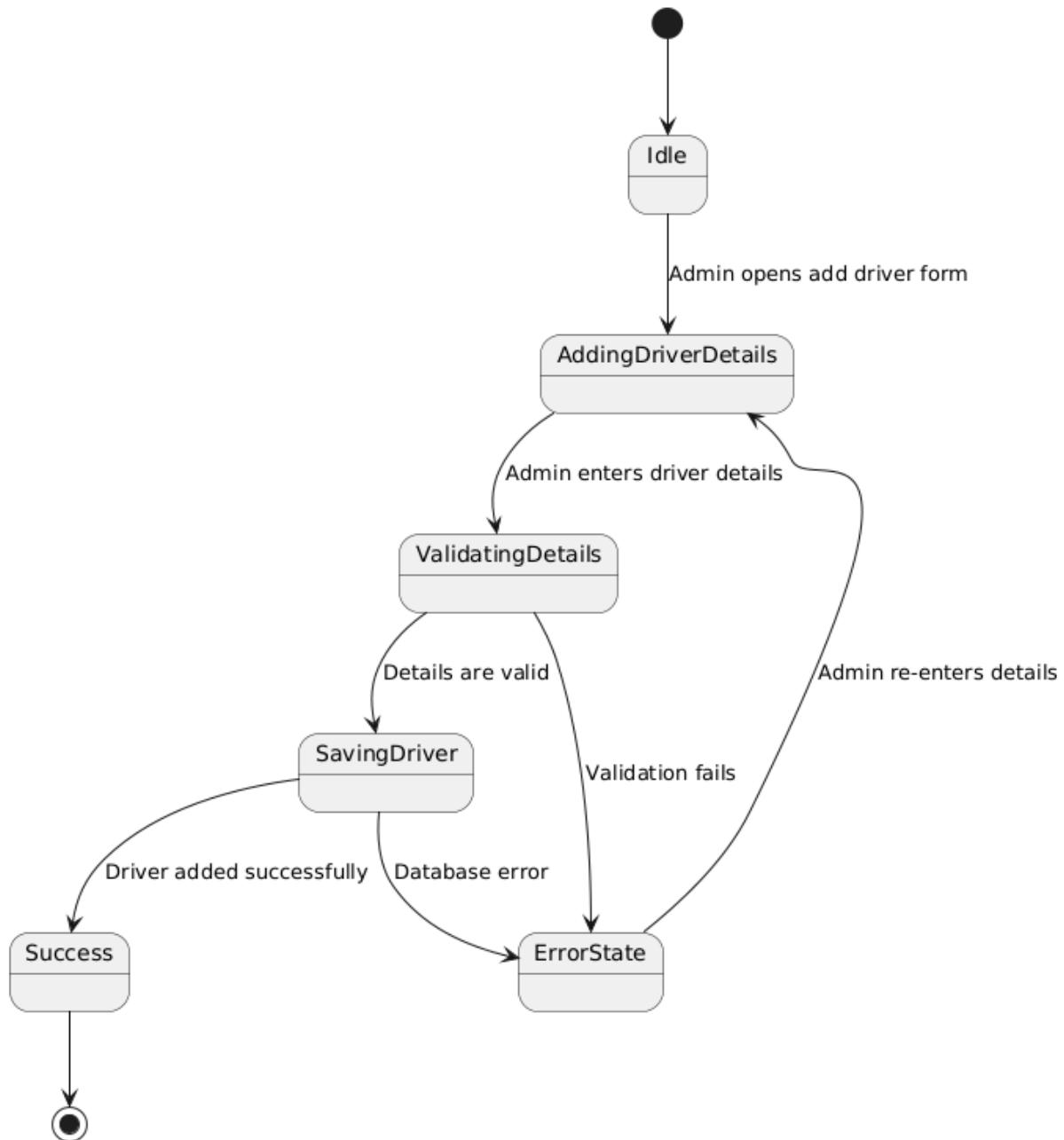


- **System Activity Diagram**

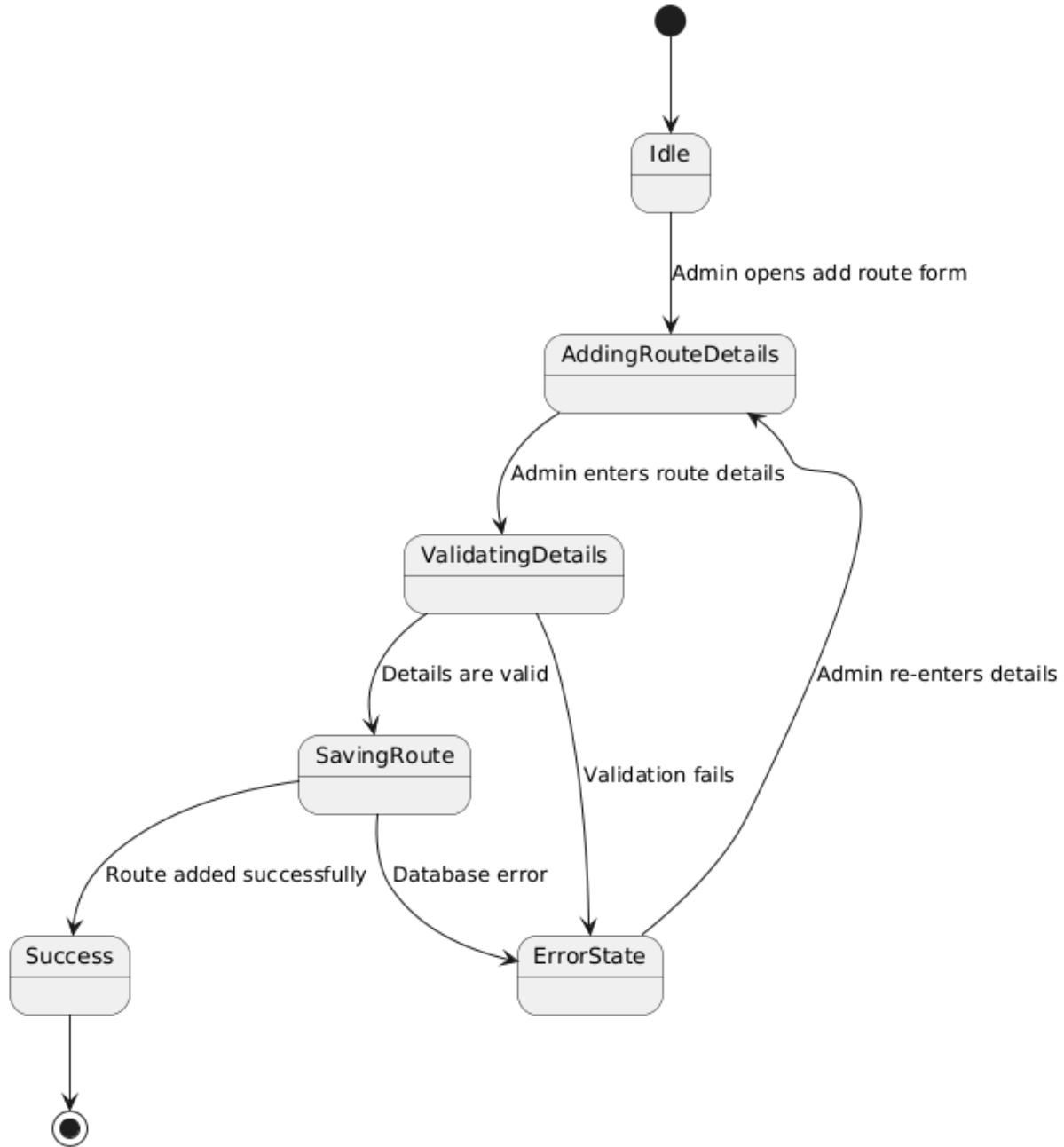


STATE DIAGRAMS

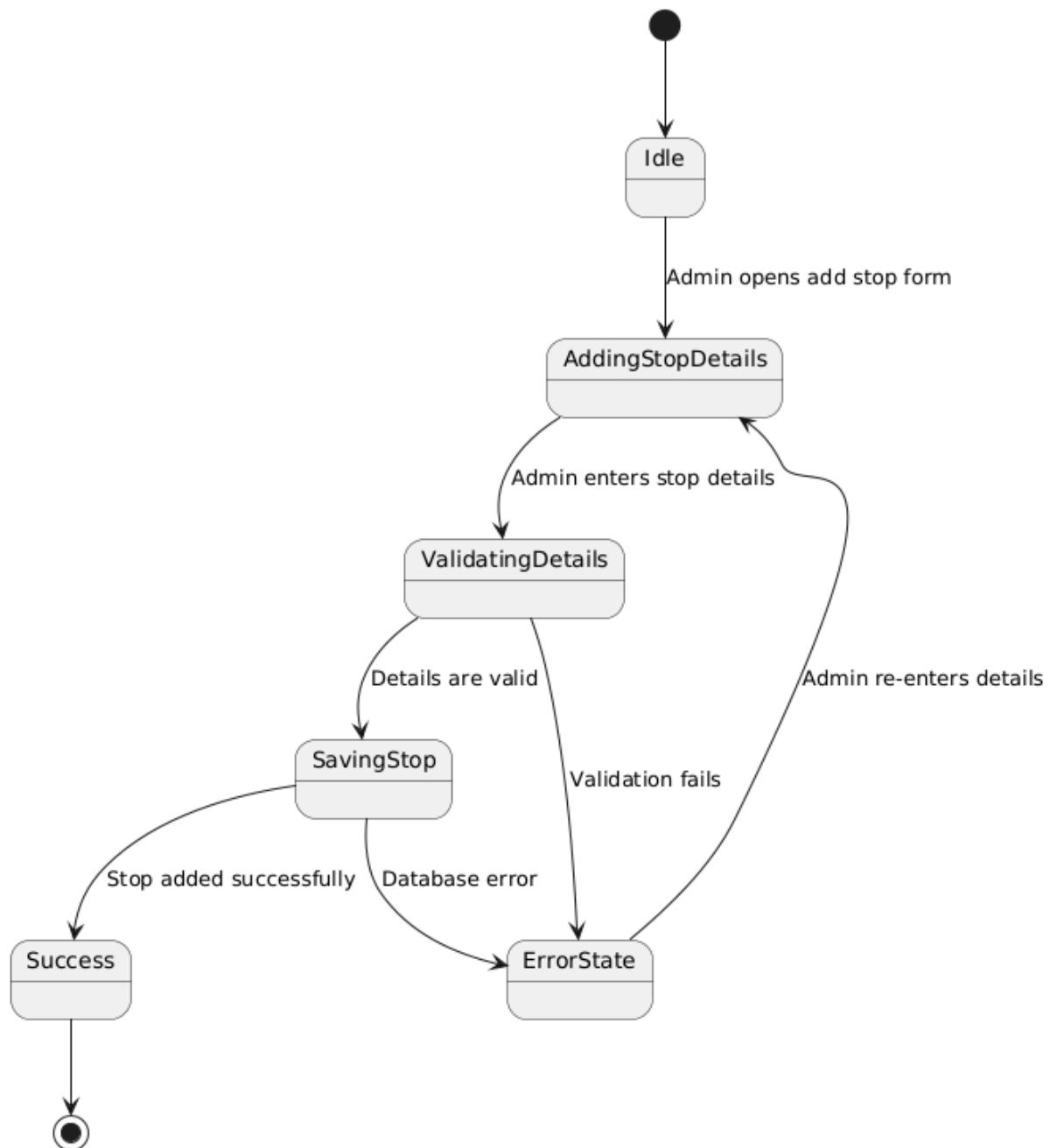
• ADD DRIVER



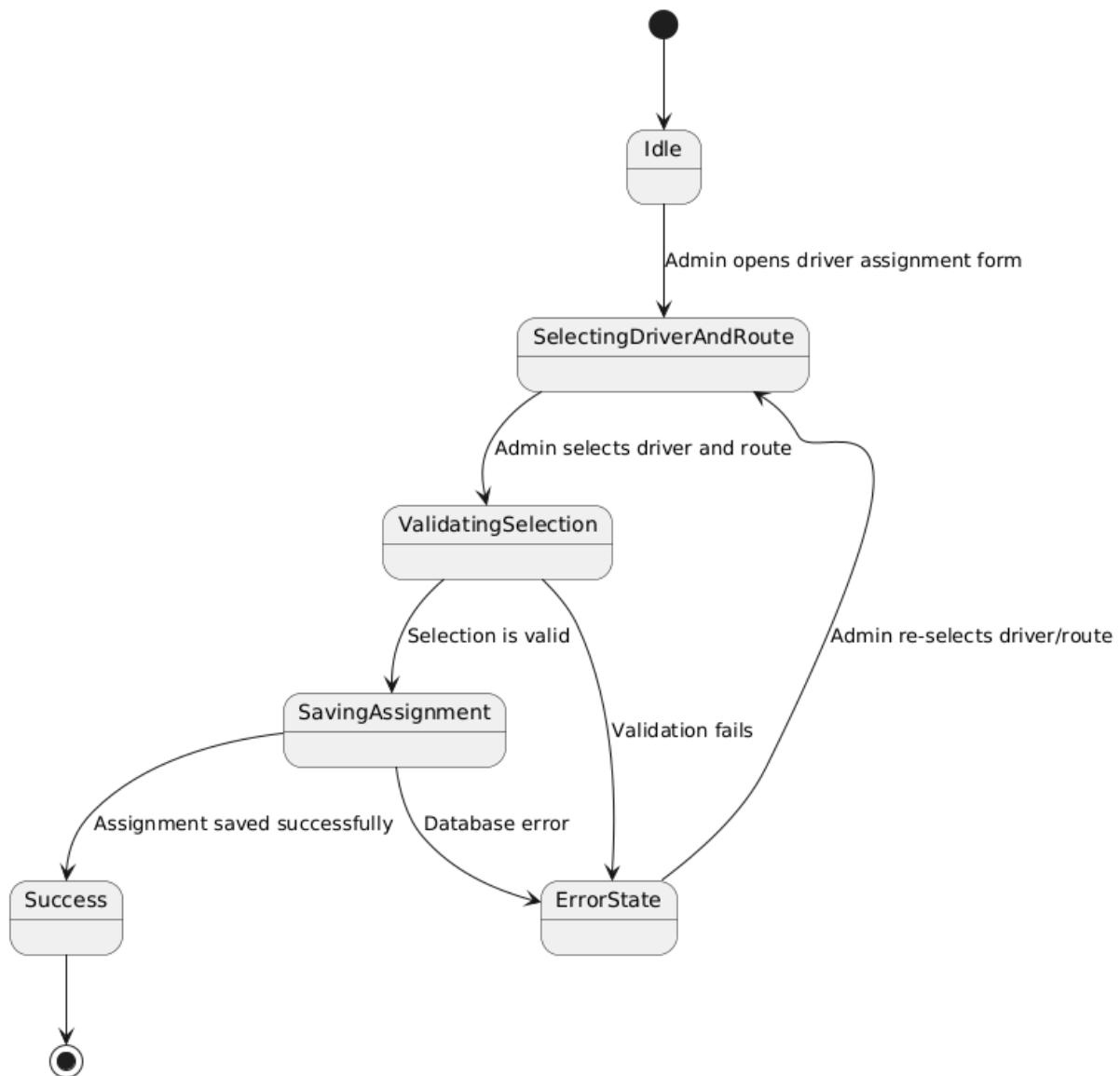
• ADD ROUTE



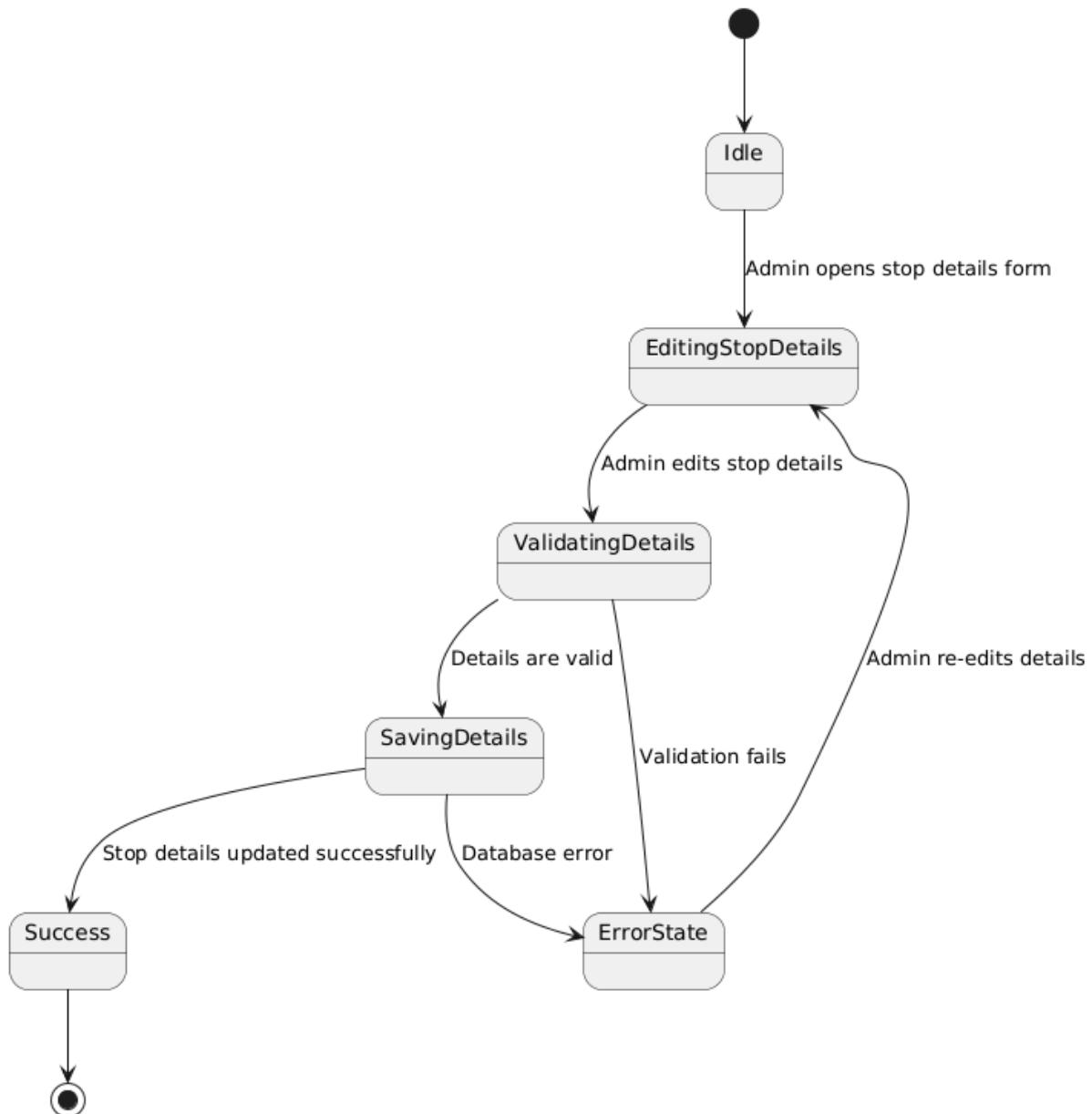
- ADD STOP



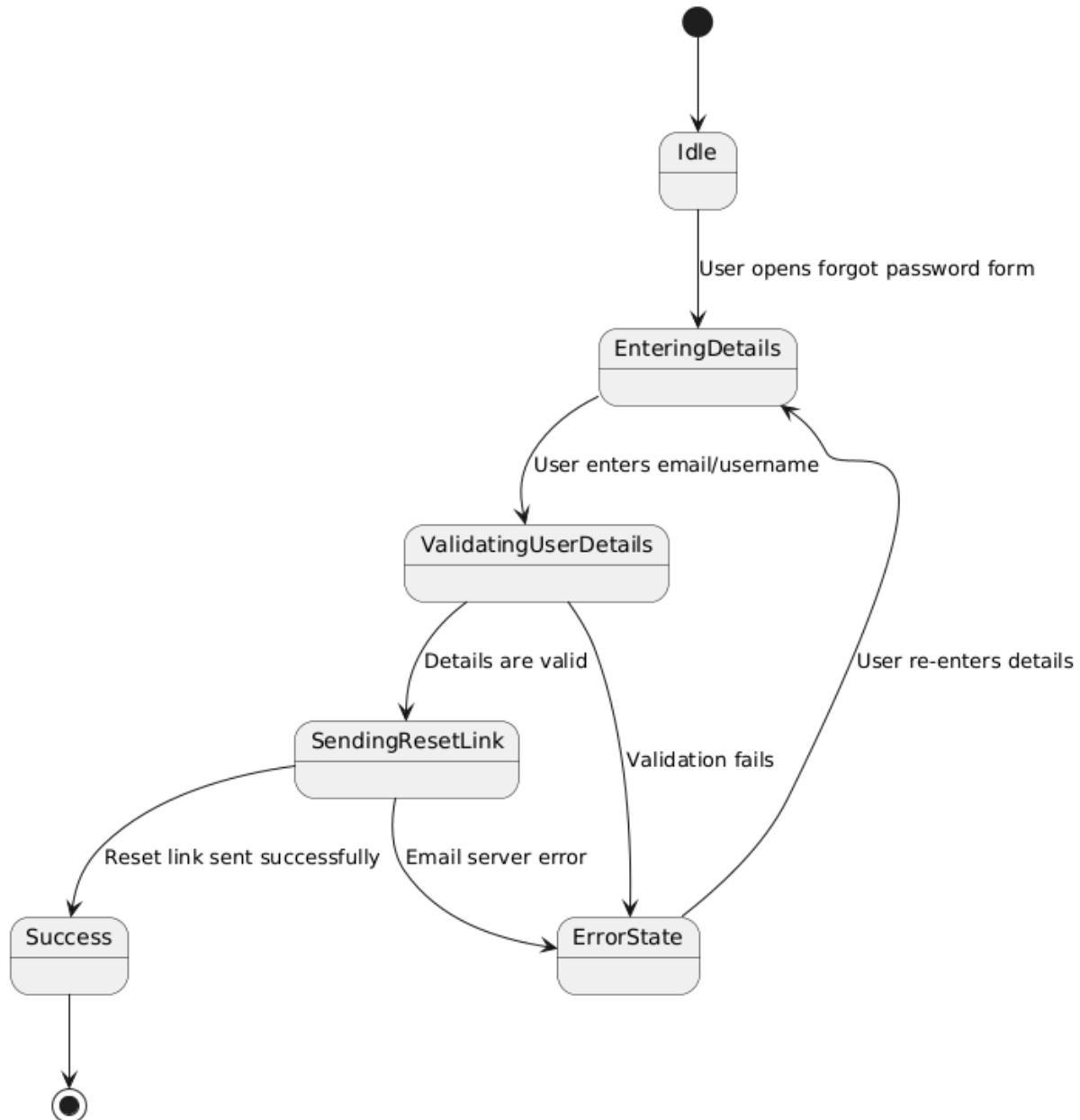
• ASSIGN DRIVER TO ROUTE



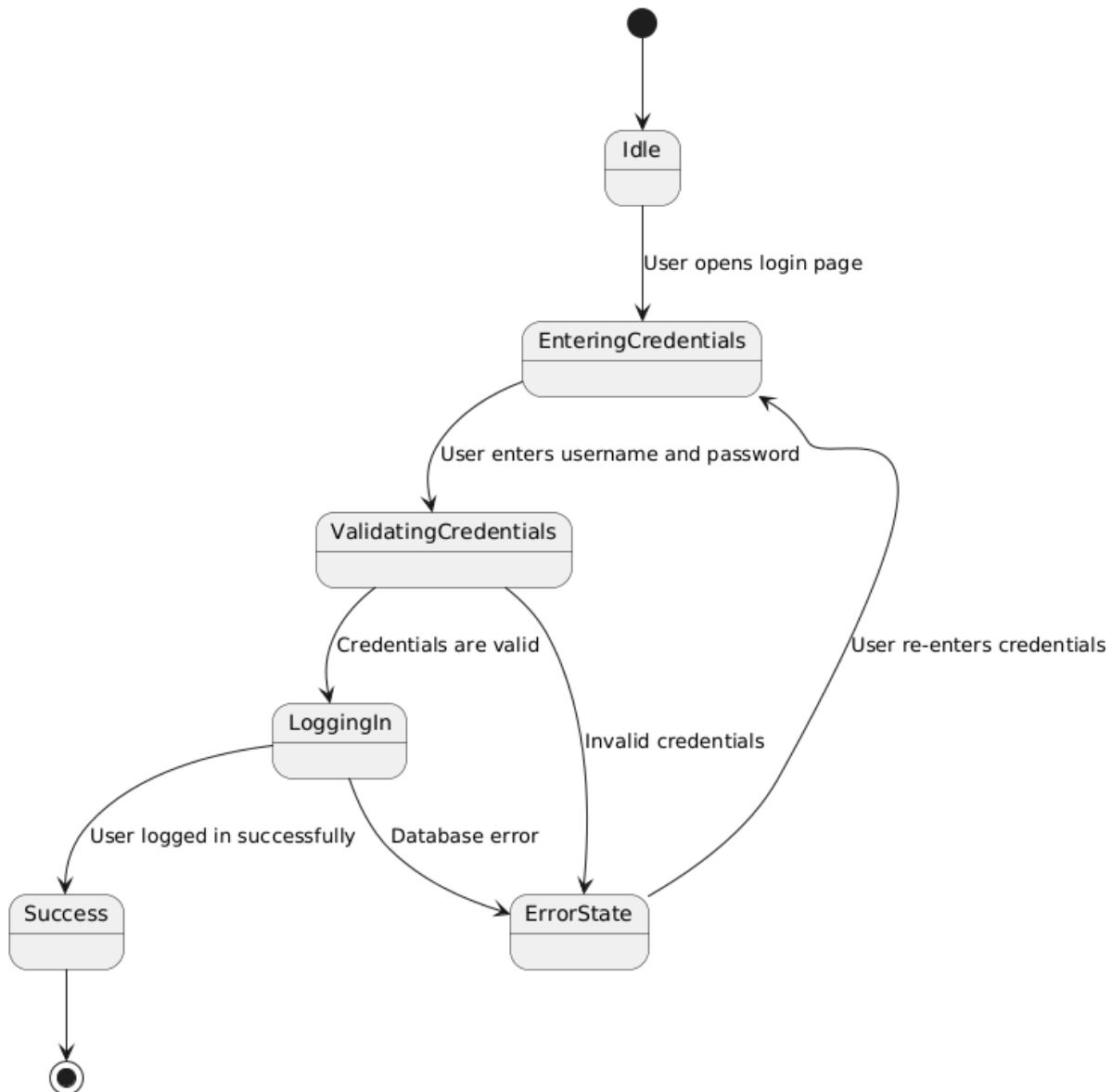
• EDIT STOP



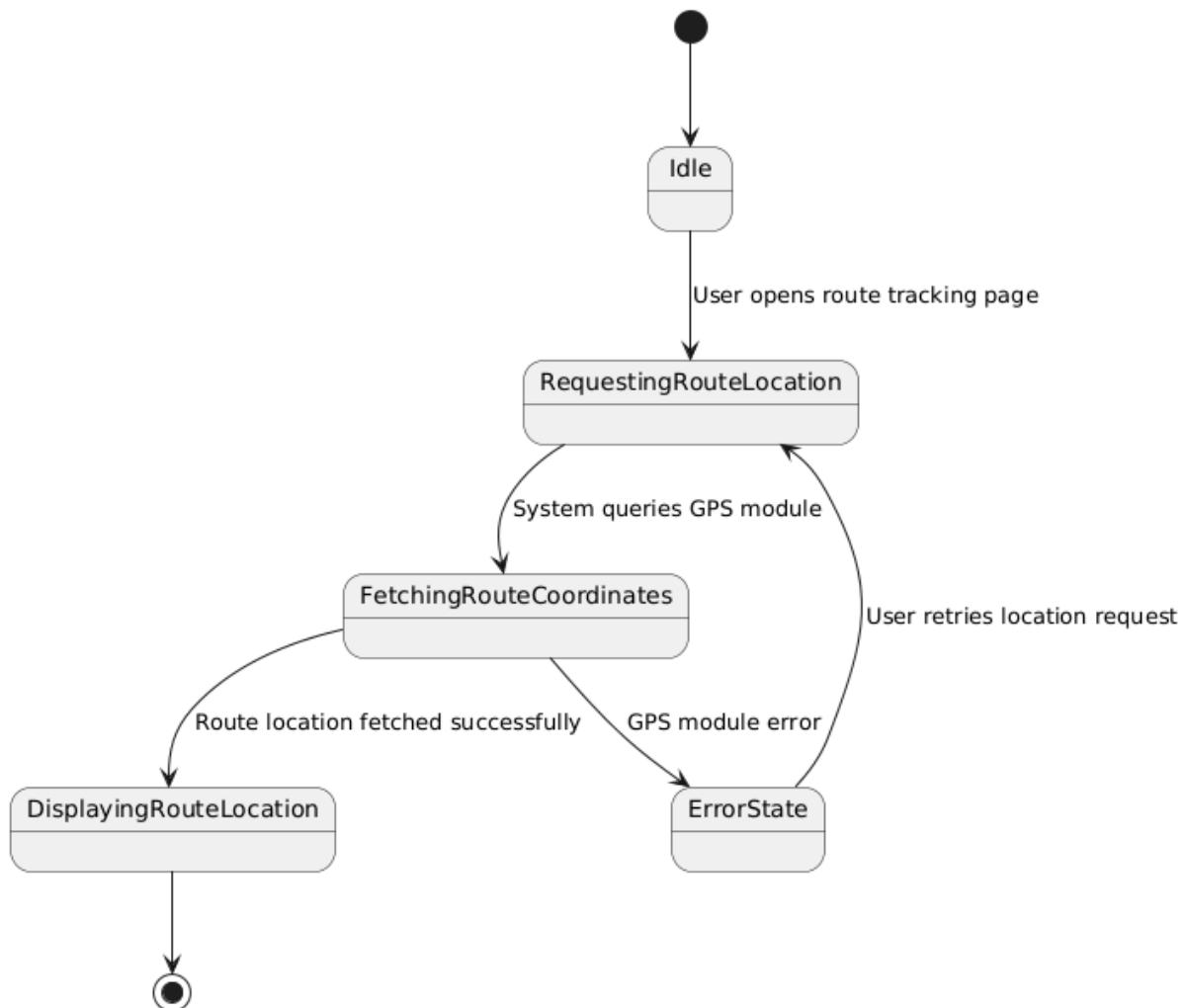
• FORGET PASSWORD



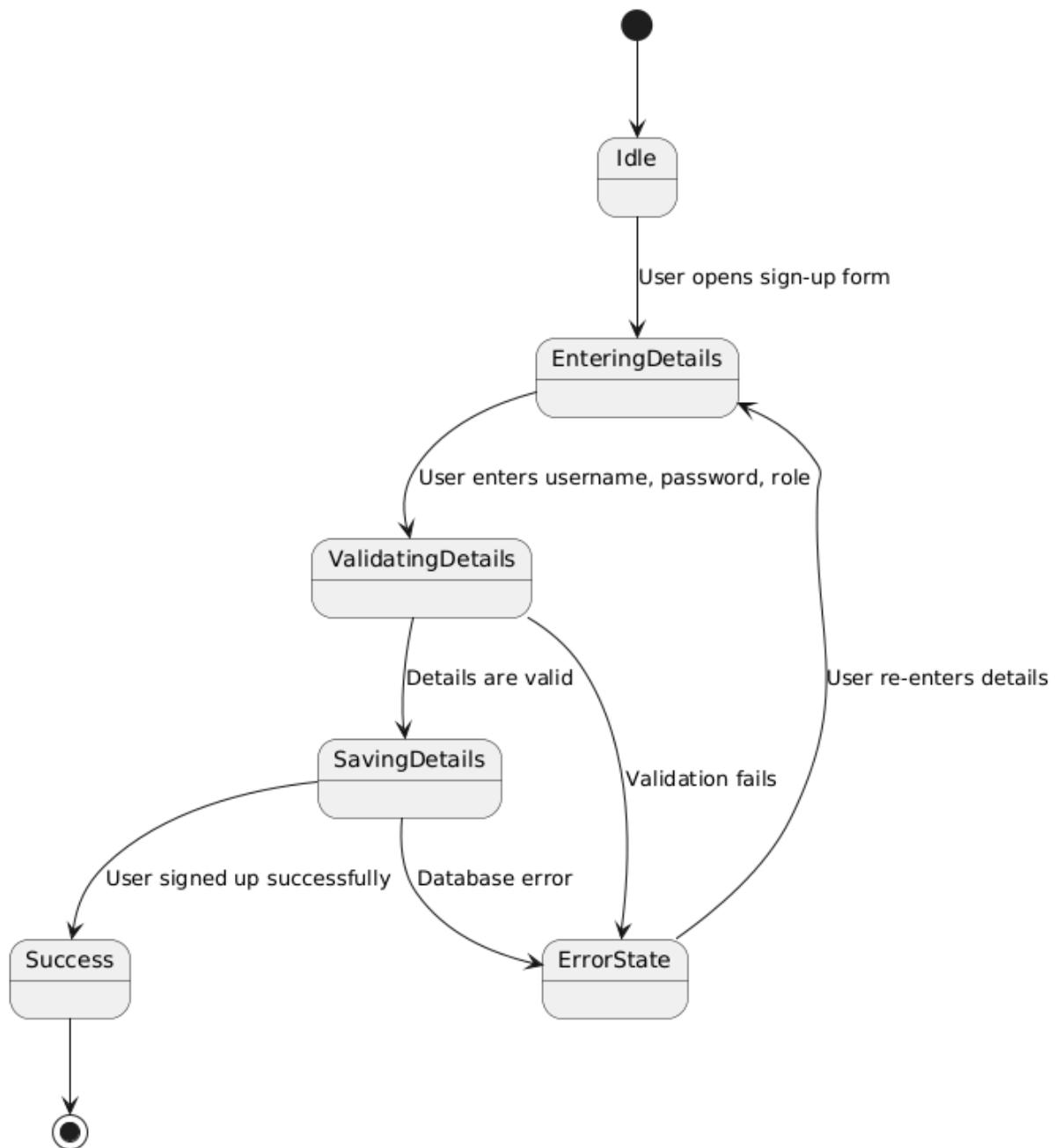
• LOGIN



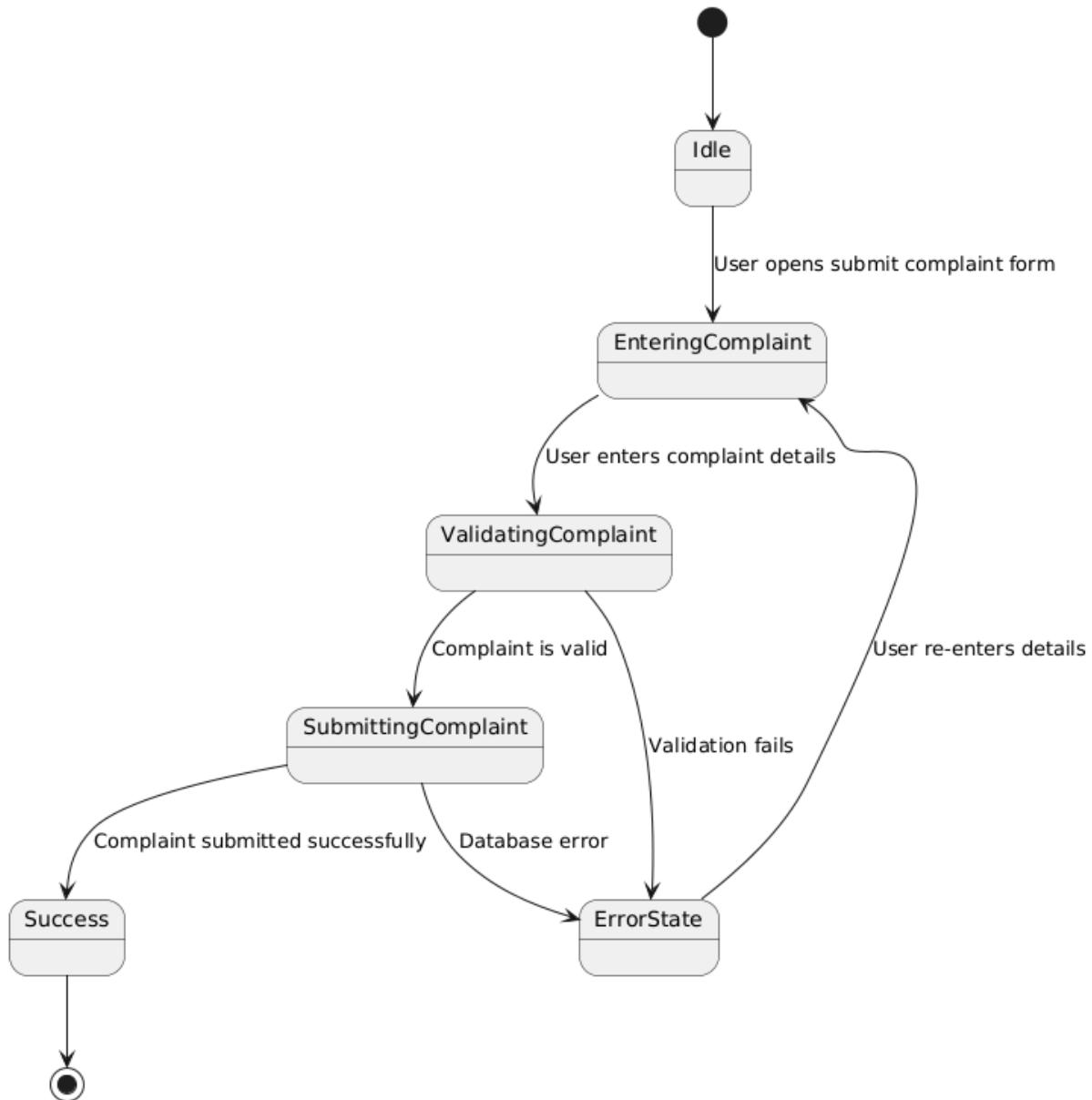
• ROUTE TRACKING



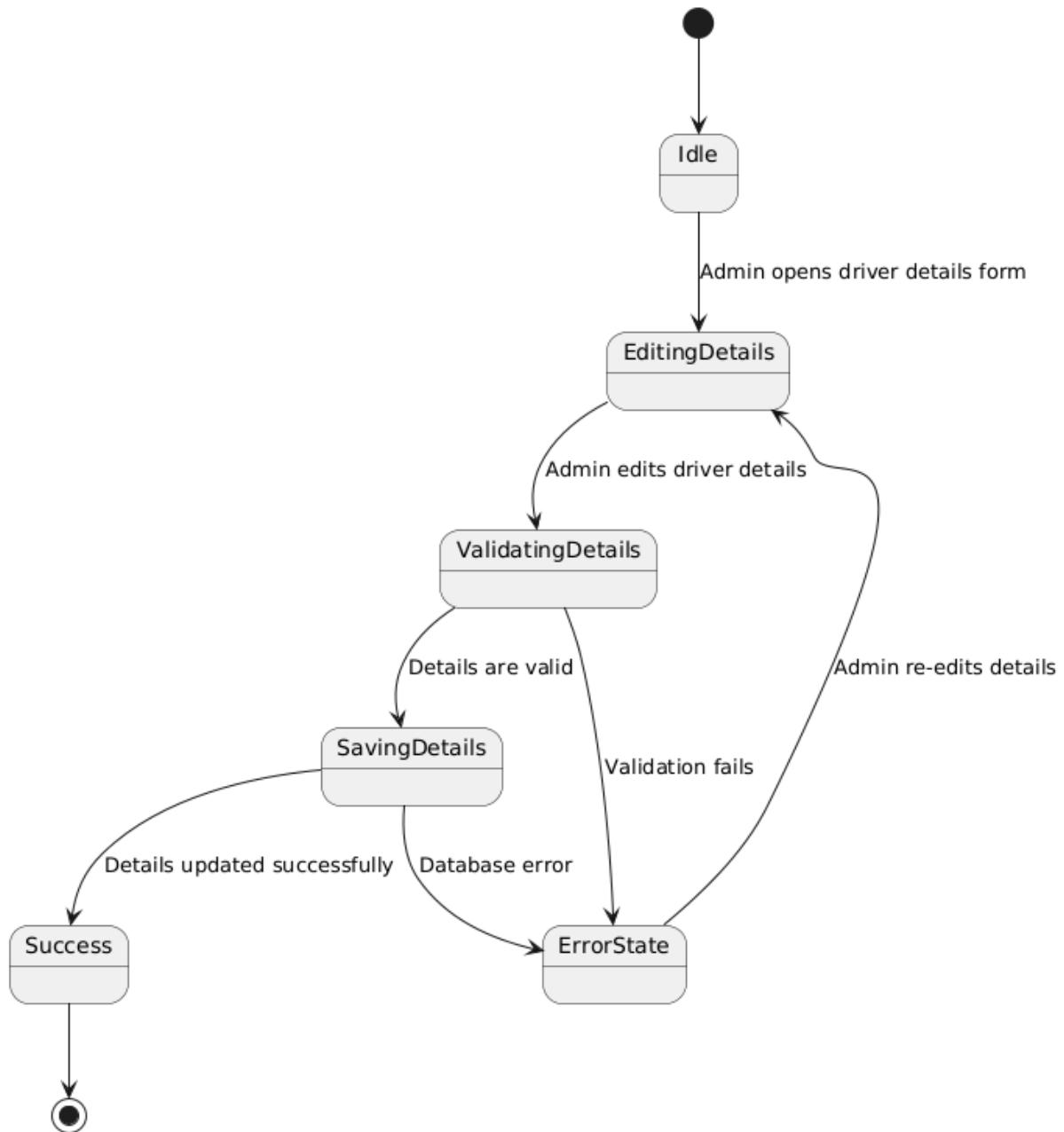
• SIGN UP



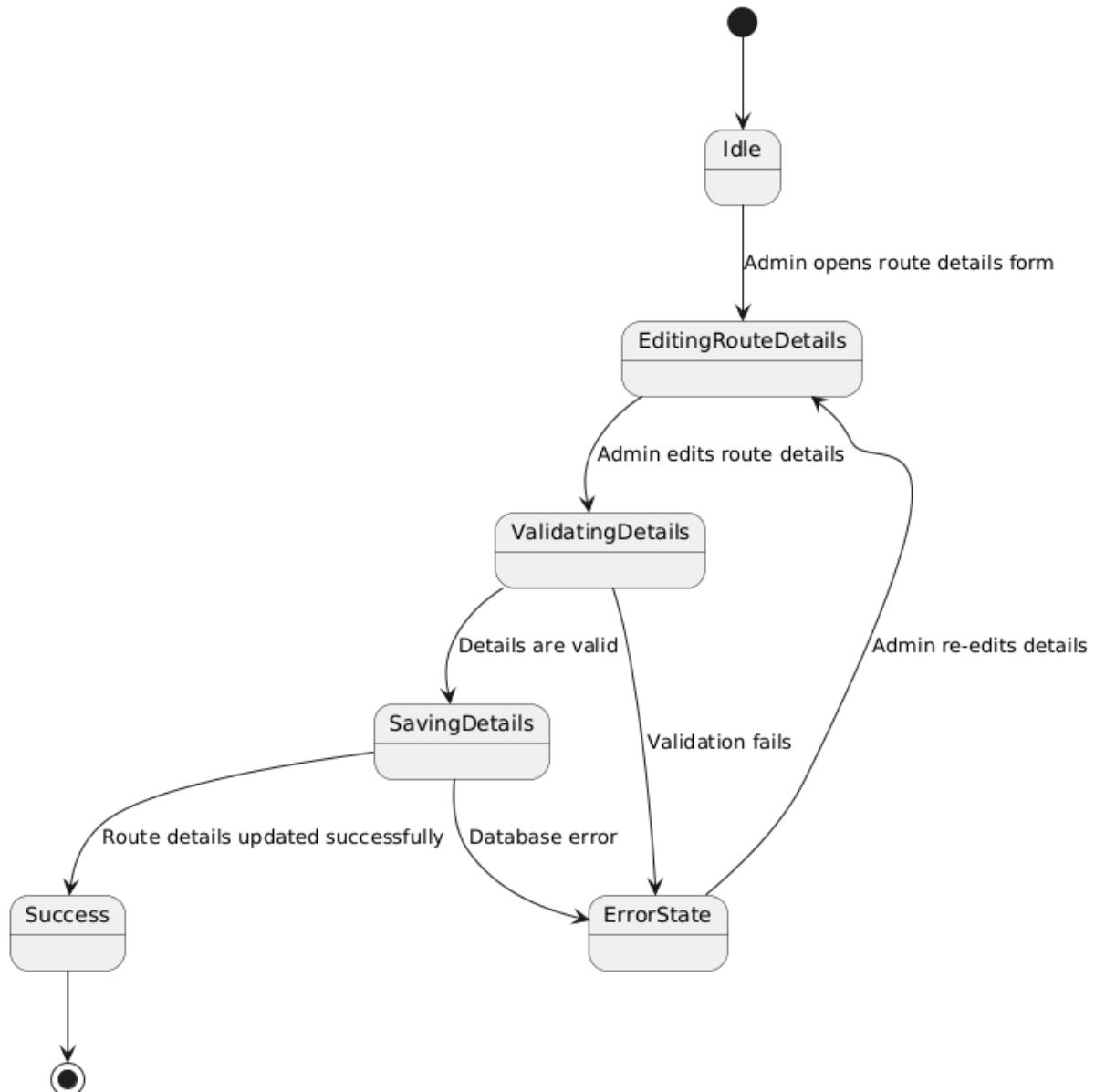
• SUBMIT COMPLAINTS



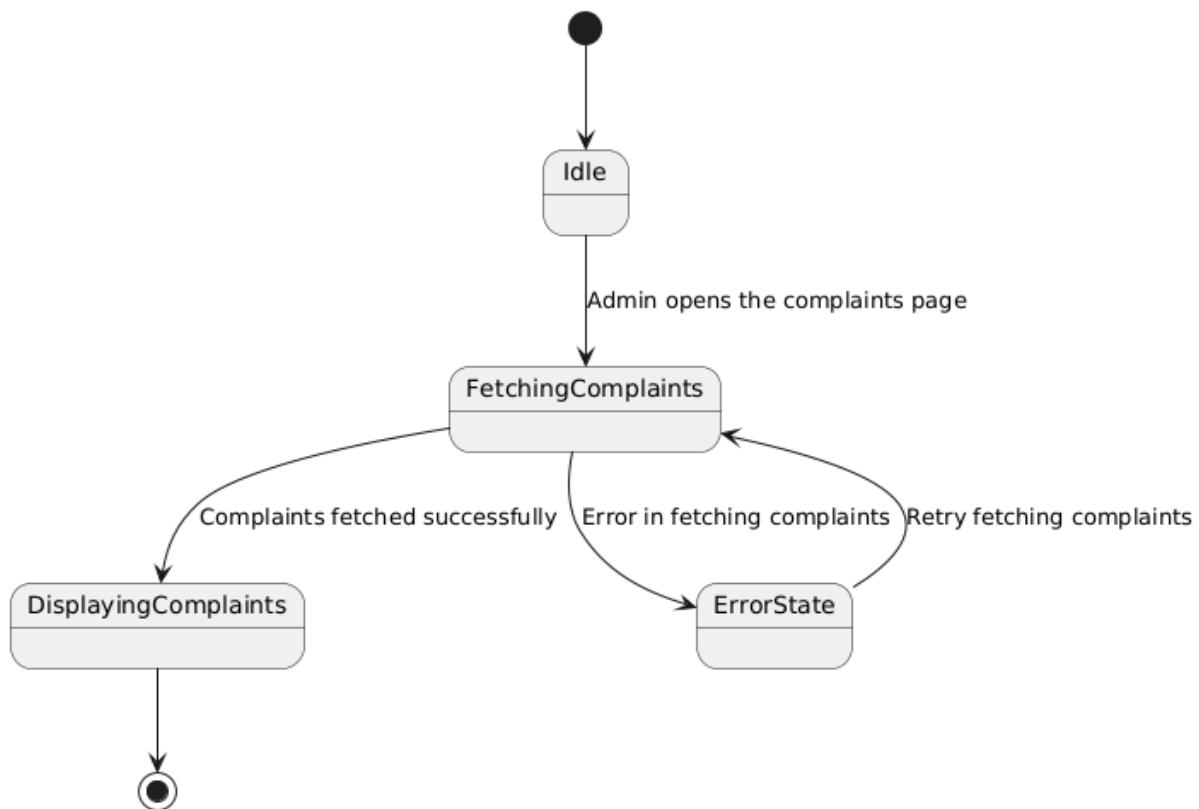
• UPDATE DRIVER



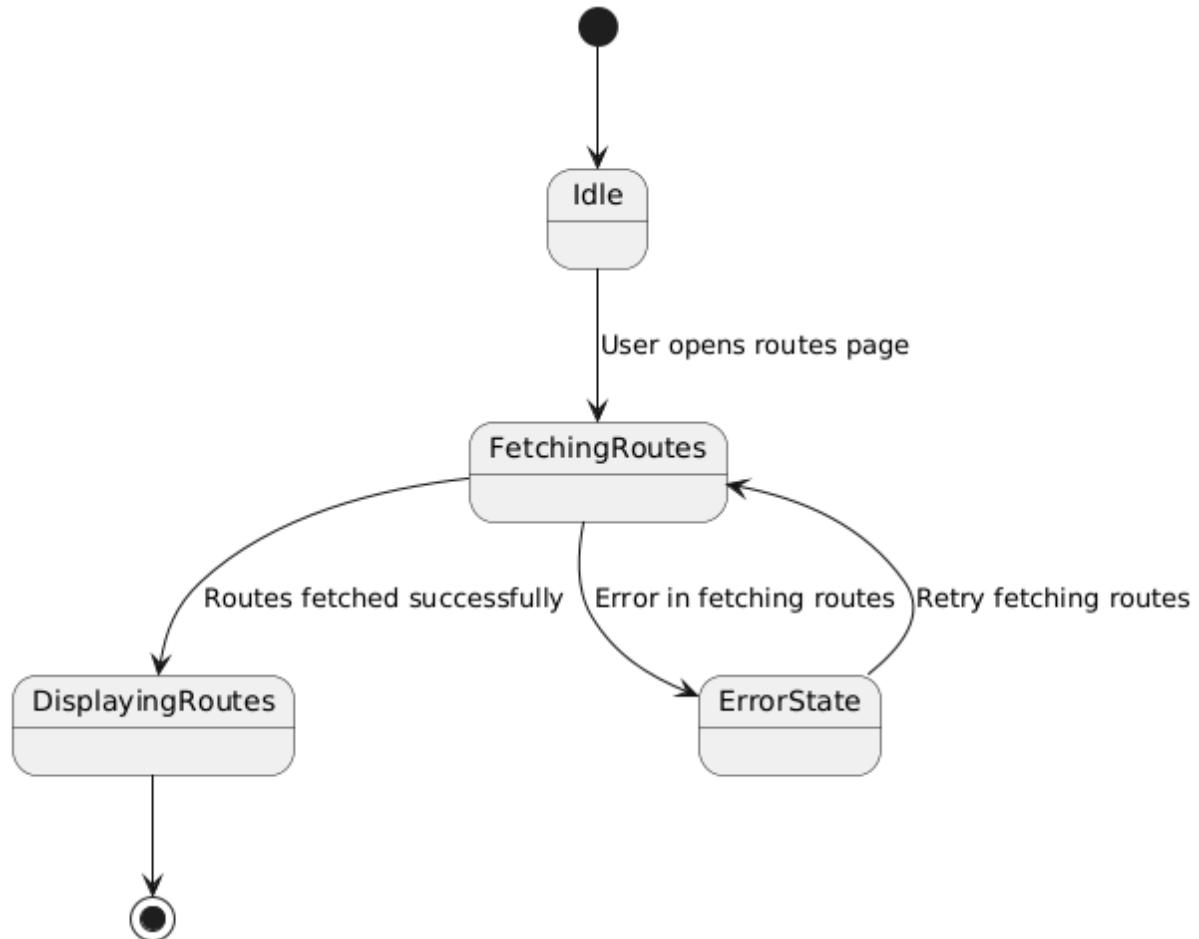
• UPDATE ROUTE



• VIEW COMPLAINTS



• VIEW ROUTES



• VIEW VEHICLE DETAIL

