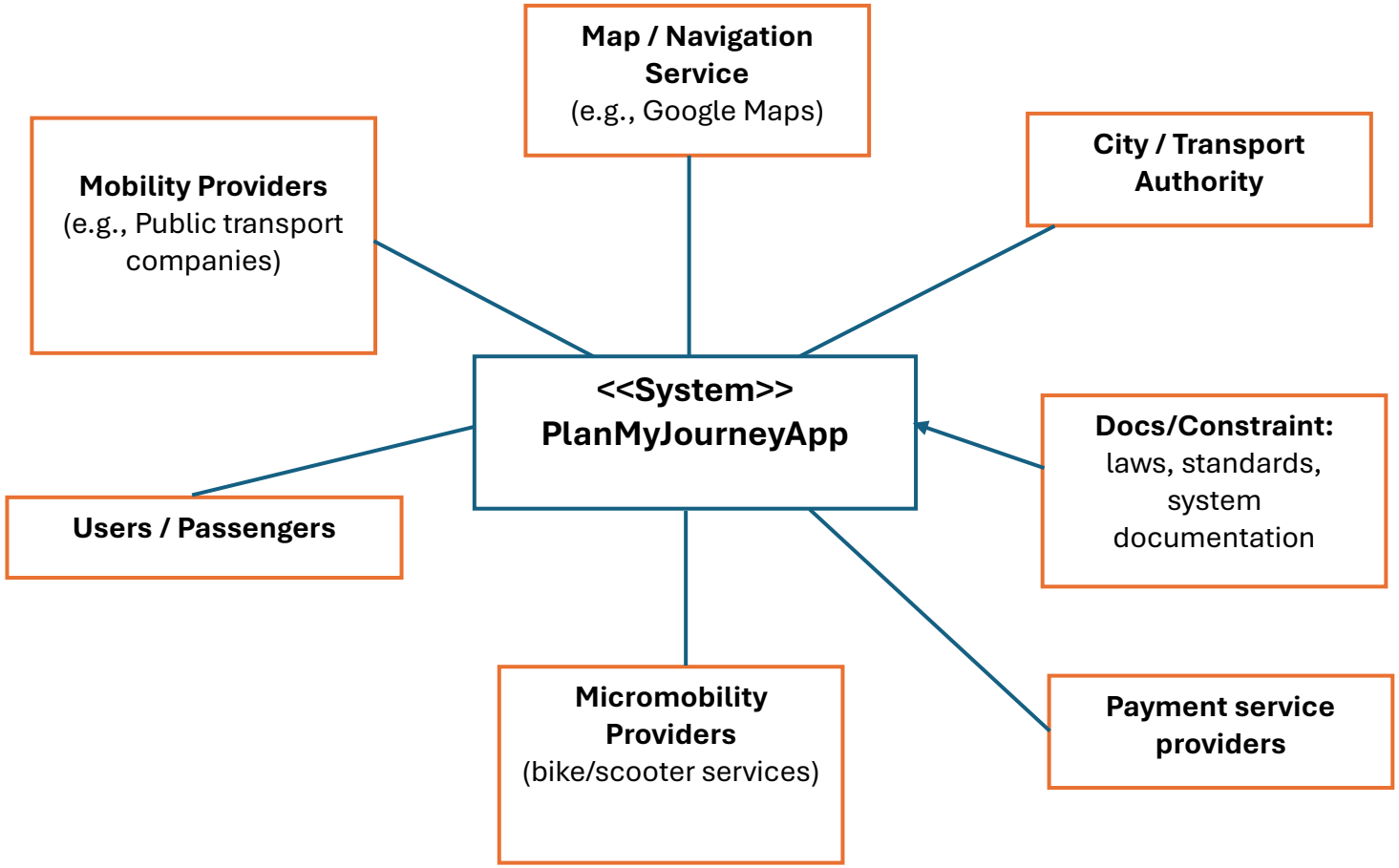
Team Members: Pawan Bhattarai
Juan Gonzalez

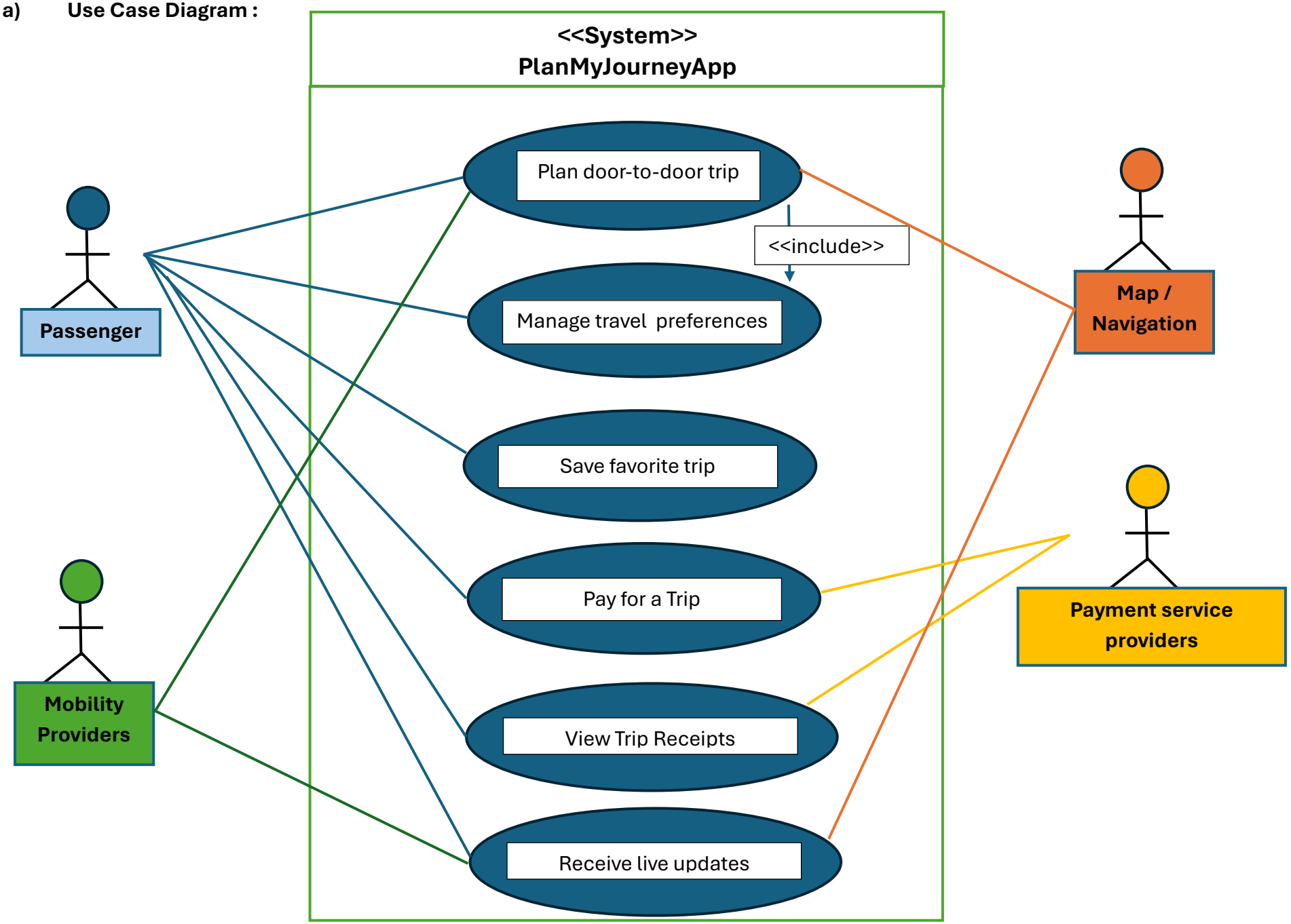
Solution Practice 3

Task 1 — System Context



Task 2— Use-Cases Documentation

a) Use Case Diagram :



b. Use Cases Definition:

Fiel	Description
Use Case ID	UC-01
Use Case Name	Plan Door-to-Door Trip
Description	Allows a passenger to plan a complete route from origin to destination using multimodal transportation.
Actors	Passenger (primary), Mobility Providers, Micromobility Providers, Map/Navigation Service
Trigger Event	Passenger selects the “Plan Trip” option and enters start and destination.
Input Data	Start location, destination, desired travel time, user preferences.
Preconditions	App is running; internet connection available; location and provider data accessible.
Postconditions	System displays one or more valid trip options.
Essential Steps	1. Passenger enters origin, destination, and time. 2. System requests routing data from map service. 3. System requests timetable/availability from mobility and micromobility providers. 4. System calculates possible door-to-door routes. 5. System applies user travel preferences. 6. System presents route options to the passenger.
Alternate Flow	No route found → System shows error and suggests changing time or locations
Assumptions	Providers deliver live data; user gives location access; internet available.

Fiel	Description
Use Case ID	UC-02
Use Case Name	Manage Travel Preferences
Description	Allows the passenger to define or modify personal travel preferences such as fastest route, cheapest route, accessible route, or fewer transfers.
Actors	Passenger
Trigger Event	Passenger selects “Travel Preferences” in the app settings.
Input Data	User-selected preference options (e.g., cost priority, speed priority, accessibility filters).
Preconditions	Passenger has an active profile; app is running.
Postconditions	Preferences are saved and automatically applied in future trip planning.
Essential Steps	1. Passenger opens the Travel Preferences menu. 2. System displays available preference categories. 3. Passenger selects or adjusts preferences.

	4. Passenger confirms changes. 5. System saves updated preferences.
Alternate Flow	• Passenger cancels → No changes are saved. • Passenger resets preferences → System restores default values.
Assumptions	Internet connection available; app storage accessible.

Fiel	Description
Use Case ID	UC-03
Use Case Name	View Trip Price and Discount Breakdown
Description	Displays the total price of a selected route, including cost per segment, fees, and applicable discounts.
Actors	Passenger (primary), Mobility Providers, Micromobility Providers, Payment Service Providers.
Trigger Event	Passenger selects a planned route from the route options list.
Input Data	Selected route details; provider pricing data; discount eligibility information.
Preconditions	A set of route options has been successfully generated (UC-01).
Postconditions	Passenger sees the complete price breakdown for the selected route.
Essential Steps	1. Passenger selects a route. 2. System requests pricing information from all mobility and micromobility providers involved. 3. System checks for applicable discounts (e.g., student fares, passes). 4. System calculates total cost. 5. System displays the total price plus segment-by-segment breakdown.
Alternate Flow	• Missing pricing data → System shows “price unavailable” for the affected segment. • Discount validation fails → System shows regular price only.
Assumptions	Provider pricing APIs are available; internet connectivity present.

Fiel	Description
Use Case ID	UC-04
Use Case Name	Pay for a Trip
Description	Enables the passenger to complete a unified payment for the entire selected multimodal trip.
Actors	Passenger (primary), Payment Service Providers
Trigger Event	Passenger selects the “Pay” option for a chosen trip.
Input Data	Selected route, total price, payment method (credit card, PayPal, etc.).
Preconditions	Route price has been calculated (UC-03); passenger has at least one valid payment method.
Postconditions	Payment is confirmed or declined; successful payments generate tickets and a receipt.

Essential Steps	1. Passenger selects “Pay for Trip.” 2. System shows the total price and payment method. 3. Passenger confirms the payment. 4. System sends a payment request to the payment provider. 5. Payment provider returns approval or rejection. 6. If approved, system stores transaction details and generates valid tickets.
Alternate Flow	• Payment declined → System shows an error and offers retry or alternative payment method. • Network failure → System notifies passenger and pauses the transaction.
Assumptions	Payment provider services are operational; stable internet connection exists.

Fiel	Description
Use Case ID	UC-05
Use Case Name	View Walking and Micromobility Segments
Description	Shows detailed information about walking, bike, or scooter segments included in a planned route.
Actors	Passenger (primary), Micromobility Providers, Map/Navigation Service
Trigger Event	Passenger opens the details of a selected route.
Input Data	Route structure, segment types, map/location data, micromobility availability.
Preconditions	A route containing walking or micromobility segments exists (from UC-01).
Postconditions	Passenger sees clear instructions for all walking and micromobility parts of the trip.
Essential Steps	1. Passenger opens the detailed view of a selected route. 2. System identifies walking and micromobility segments. 3. System requests map directions and distances from the map service. 4. System requests availability and travel time from micromobility providers (if applicable). 5. System displays each segment with distance, estimated duration, and step-by-step instructions.
Alternate Flow	• Micromobility availability missing → System marks segment as “unavailable.” • Map service unreachable → System displays minimal text instructions without a map.
Assumptions	Providers deliver segment data; map service is accessible; stable internet connection exists.

Fiel	Description
Use Case ID	UC-06
Use Case Name	Receive Live Updates and Re-Routing
Description	Provides the passenger with real-time disruption alerts and alternative route suggestions during an active trip.
Actors	Passenger (primary), Mobility Providers, Micromobility Providers, Map/Navigation Service
Trigger Event	The passenger has an active trip, and a disruption or delay is detected.

Input Data	Live delay/disruption notifications, current passenger position, alternative route options.
Preconditions	Passenger has a valid active trip; live data is available from providers.
Postconditions	Passenger is informed of disruptions and may receive an updated trip plan.
Essential Steps	1. System monitors live data from mobility and micromobility providers. 2. A provider sends a disruption or delay alert. 3. System checks if the disruption affects the passenger's active trip. 4. If affected, the system notifies the passenger. 5. System requests updated routing information from map and provider systems. 6. System calculates one or more alternative routes. 7. Passenger selects an alternative route or keeps the current one. 8. System updates the active trip accordingly.
Alternate Flow	• No alternative route available → System informs passenger and suggests waiting or contacting support.
Assumptions	Providers deliver real-time data; map service is available; internet connection exists.

Fiel	Description
Use Case ID	UC-07
Use Case Name	Save and Recall Favorite Trips
Description	Allows the passenger to save frequently-used trips and quickly access them for future travel.
Actors	Passenger
Trigger Event	Passenger selects "Save as Favorite" for a planned or completed trip OR opens the Favorites list.
Input Data	Trip details (origin, destination, time), optional custom trip name.
Preconditions	Passenger has a profile; a valid trip has been planned or completed.
Postconditions	Favorite trip is stored or retrieved for reuse.
Essential Steps	**Saving a Favorite:** 1. Passenger views a planned or completed trip. 2. Passenger selects "Save as Favorite." 3. System asks for an optional name (e.g., "Home → Work"). 4. Passenger confirms. 5. System stores the favorite trip in the user profile. **Recalling a Favorite:** 6. Passenger opens the Favorites menu. 7. System displays a list of stored favorite trips. 8. Passenger selects a favorite. 9. System loads the stored trip data and starts trip planning (UC-01).
Alternate Flow	• No favorites stored → System shows empty list with option to add favorites.

	• Passenger cancels → No changes saved.
Assumptions	User profile storage available; internet connection for re-planning a trip.

Fiel	Description
Use Case ID	UC-08
Use Case Name	Change Language
Description	Allows the passenger to change the app's display language.
Actors	Passenger
Trigger Event	Passenger opens "Settings → Language."
Input Data	Selected language option.
Preconditions	App supports at least two languages; app is running.
Postconditions	The app interface is displayed in the newly selected language.
Essential Steps	1. Passenger opens the Settings menu. 2. Passenger selects "Language." 3. System displays available languages. 4. Passenger selects a language. 5. System updates and stores the language preference. 6. System reloads UI text in the chosen language.
Alternate Flow	• Passenger cancels → System keeps previous language. • Selected language cannot load → System reverts to default language.
Assumptions	Language files are available locally or via download; storage is accessible, internet connection is active

Fiel	Description
Use Case ID	UC-09
Use Case Name	Plan an Accessible Trip
Description	Provides door-to-door routes optimized for passengers with accessibility needs (e.g., step-free paths, elevators, low-floor vehicles).
Actors	Passenger (primary), Mobility Providers, Micromobility Providers
Trigger Event	Passenger enables accessibility mode in preferences or selects accessibility filters during trip planning.
Input Data	Accessibility settings (step-free routes, fewer transfers, elevator availability), start & destination, travel time.
Preconditions	Passenger has set accessibility preferences OR has activated accessibility filters; live provider data is available.
Postconditions	Only accessible or accessibility-optimized routes are shown to the passenger.
Essential Steps	1. Passenger enables accessibility mode in preferences or trip planner. 2. Passenger enters start, destination, and time.

	3. System requests accessibility data from mobility and micromobility providers (elevators, low-floor vehicles, accessible stations). 4. System filters out non-accessible route options. 5. System adjusts transfer times if needed (e.g., longer for wheelchair users). 6. System displays accessible route options.
Alternate Flow	• No fully accessible route exists → System shows partial options and explains limitations. • Accessibility data unavailable → System notifies passenger that accessibility information may be incomplete.
Assumptions	Providers send accessibility info; the passenger has enabled accessibility options.

Fiel	Description
Use Case ID	UC-010
Use Case Name	Generate and Store Trip Receipts
Description	Creates and stores official receipts for completed trips so passengers can access or download them later.
Actors	Passenger (primary), Payment Service Providers
Trigger Event	A trip has been successfully paid (UC-04) OR passenger selects “Receipts” from the app menu.
Input Data	Payment confirmation, trip details (date, route, segments), price, tax, method of payment.
Preconditions	Passenger has completed at least one paid trip; payment was confirmed by the provider.
Postconditions	Receipt is generated, stored, and made accessible to the passenger.
Essential Steps	**When payment is completed:** 1. Payment provider confirms successful transaction. 2. System gathers trip details and pricing information. 3. System generates a digital receipt. 4. System stores the receipt in the passenger’s account. **When the passenger opens receipts:** 5. Passenger opens “My Trips / Receipts.” 6. System displays a list of past trips with available receipts. 7. Passenger selects a trip. 8. System shows the receipt and allows download.
Alternate Flow	• Receipt generation fails → System logs the error and notifies the passenger to retry later.
Assumptions	Storage is available; payment confirmation data is accurate and complete; internet connection exists.