Smart Logistics Optimization Application

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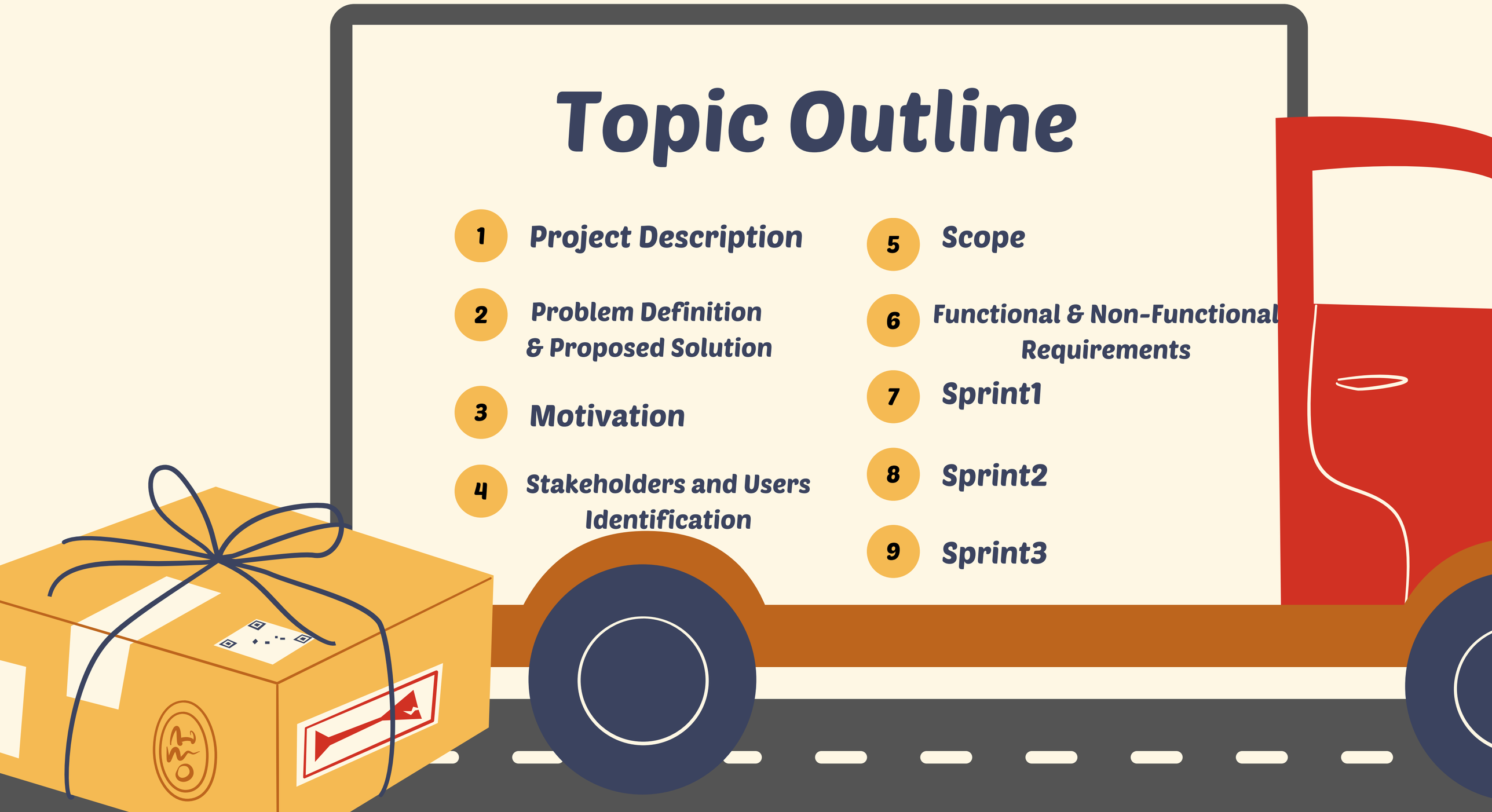
Topic Outline



Project Description

The Kingdom faces logistical challenges due to its vast area and increasing demand in the food and beverage sectors. Efficient transportation of perishable goods is crucial but often hindered by traditional methods, leading to high fuel consumption and long delivery times.

Objective:

Develop an innovative application to optimize logistics operations by:

- Enhancing route efficiency
- Reducing fuel consumption
- Minimizing delivery times

Problem Definition

The Kingdom of Saudi Arabia faces significant challenges in managing logistics operations due to its vast geographic area and growing demand in the food and beverage sectors.

- Perishable Goods: Timely delivery is crucial for maintaining product quality.
- Inefficient Methods: Traditional transportation leads to high fuel consumption and extended delivery times.

Proposed Solution

Smart Logistics Optimization Application:
An innovative app designed to enhance logistics efficiency in Saudi Arabia's food and beverage sector.

Key Features:

- Dynamic Route Planning
- User-Specific Interfaces
- Real-Time Data Integration

Motivation

This project aims to enhance logistics efficiency in Saudi Arabia, a key factor for the country’s growing economy. By optimizing fuel consumption and reducing transit times, the application will:

- Lower costs for logistics companies
- Increase operational efficiency
- Promote environmental sustainability

Additionally, it will enable faster deliveries and improve service quality for businesses and consumers, supporting the Kingdom's economic and service goals.

Stakeholders and Users Identification

The Client:
Food Supply Company

The Customer:
Food Supply Company

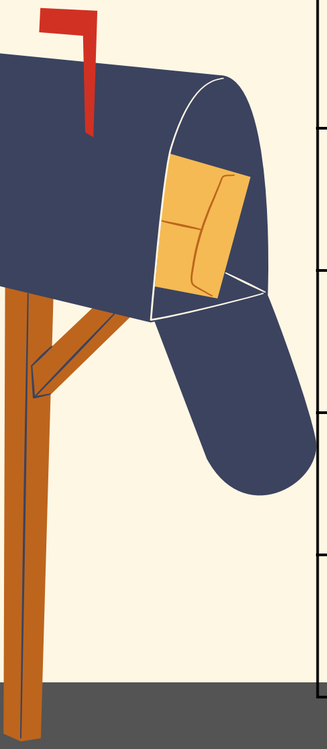
The Other Stakeholders:
Administrators, Managors, Drivers, Supermarket Worker

The Hands-On Users of the Product: Drivers, Managers

Functional Requirements

Feature	Req Num	Requirement	Priority
User Registration	FR1	Users must be able to create an account with roles such as logistics managers, and drivers.	High
Login after Registration	FR2	Users must be able to log in after registering in the sign up page based on their roles (Manager or Driver).	Low
Order Creation	FR3	The manager must be able to create new orders	High
Route Optimization	FR4	The system calculate the distance then uses Google Direction API to find the best route for the driver based on the order details and suggest the most efficient routes based on real-time traffic data, distance, road conditions, prior.	High
Status Updates	FR5	The system should provide notifications that update the status of order for the manager.	Medium

Non-Functional Requirements

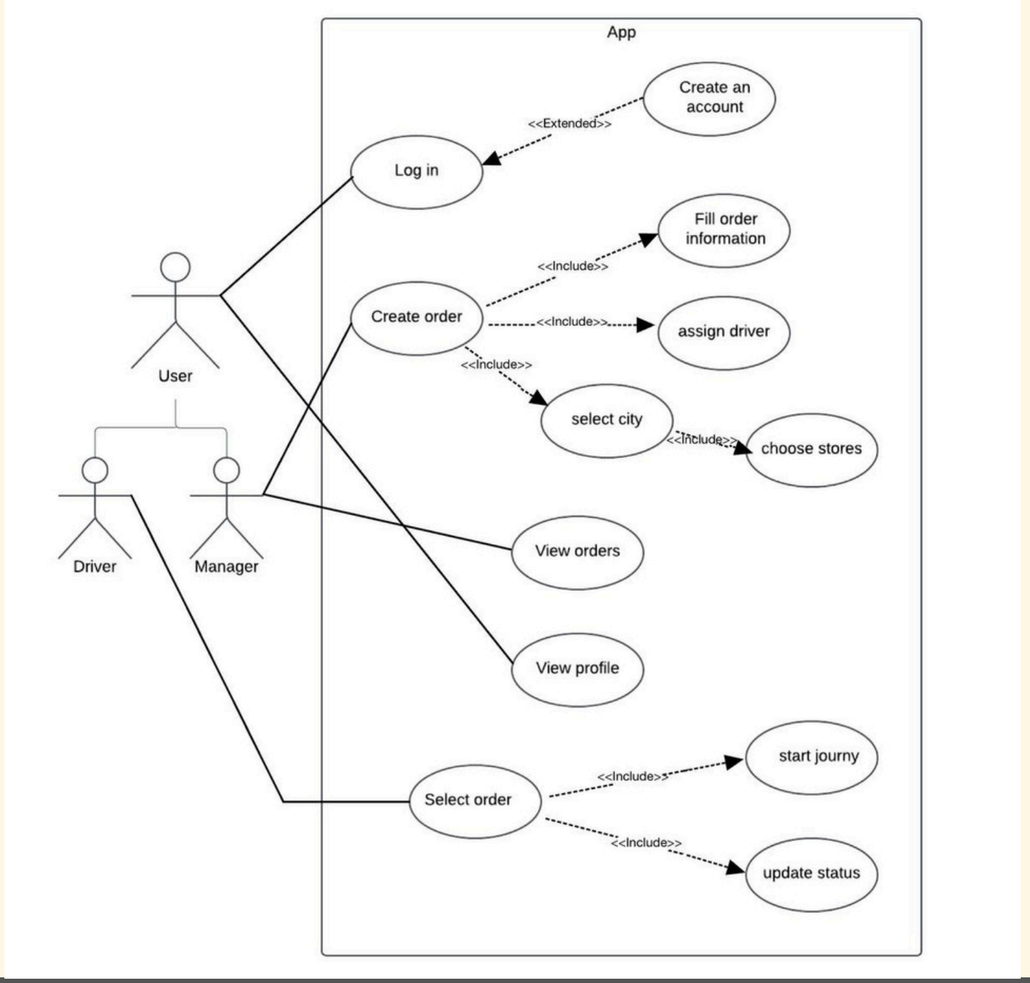


Category	Req Num	Description	Priority
Performance	NFR1	The system must process route optimization requests and provide results within 3 seconds to ensure timely decision-making.	High
	NFR2	The system must respond to user actions (e.g., entering order details) within 2 seconds	High
Scalability	NFR3	The system should support up to 1,000 concurrent users, including logistics managers, drivers, and administrators, without a decrease in performance.	High
Availability	NFR5	the system must support continuous operations and ensure that logistics processes can be accessed and managed from different zones in Saudi Arabia	High
Usability	NFR6	the system should provide intuitive and easy-to-use interfaces for users at different levels, from warehouse workers to supply chain managers	Medium
Security	NFR7	The system must Ensure the confidentiality and integrity of sensitive data through encryption and secure access controls	High

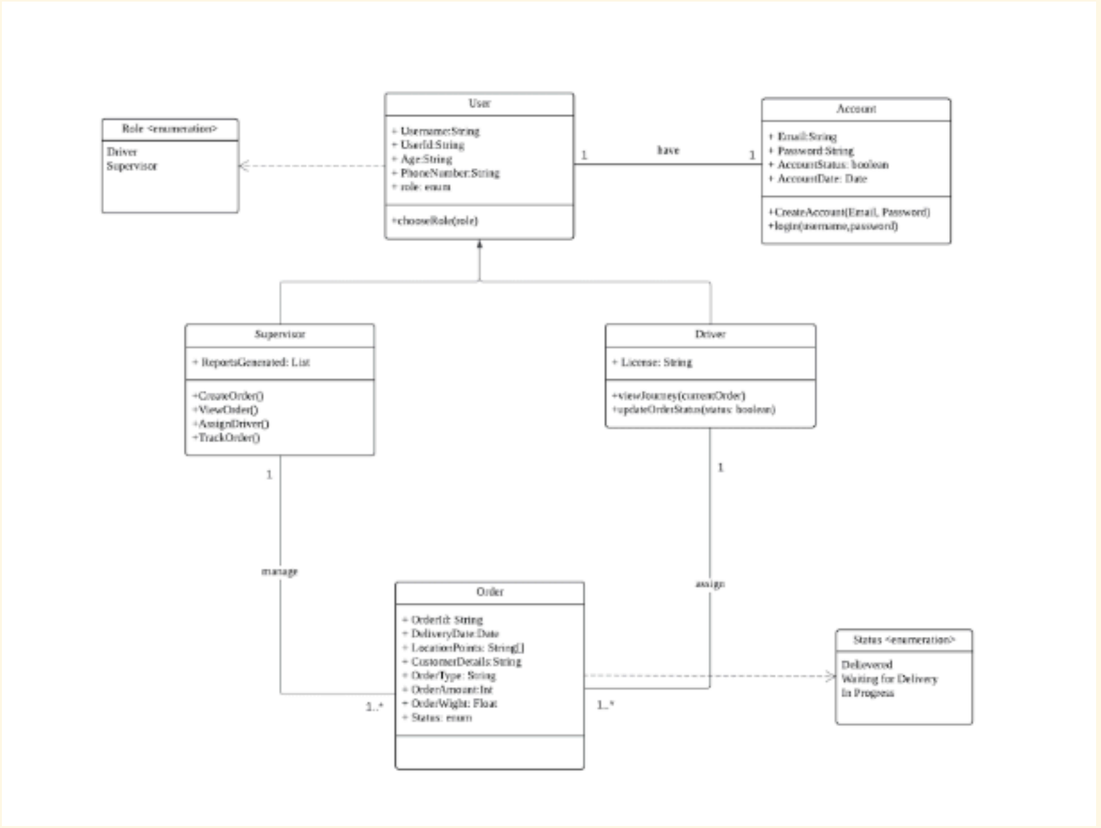
Tools Used in this Project

1. Diagrams: Lucidchart
2. The IDE: Android Studio
3. The agile planning tool: Jira
4. Repository: Github
5. Communication: Slack
6. FireBase

Use Case Diagram



Class Diagram



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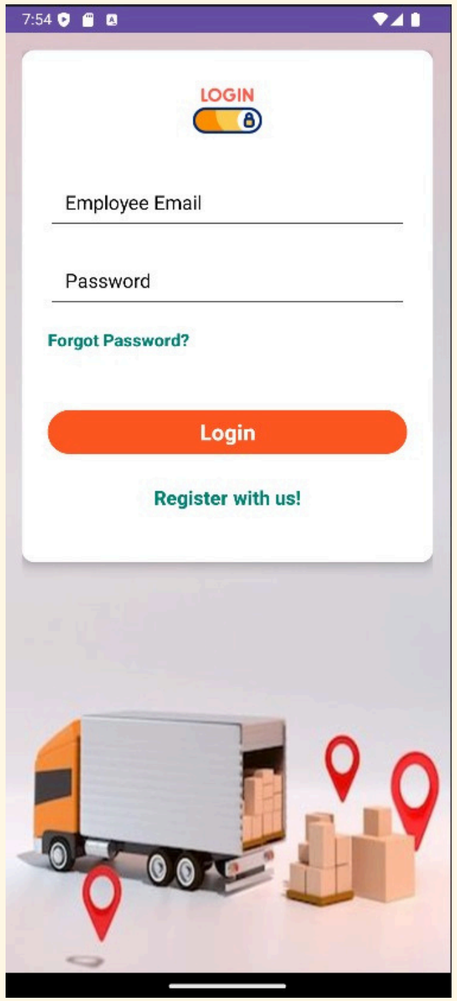
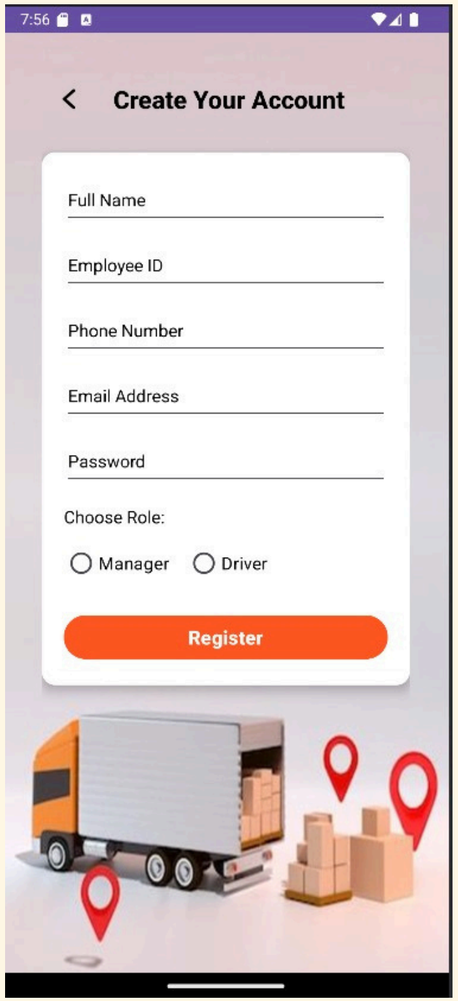
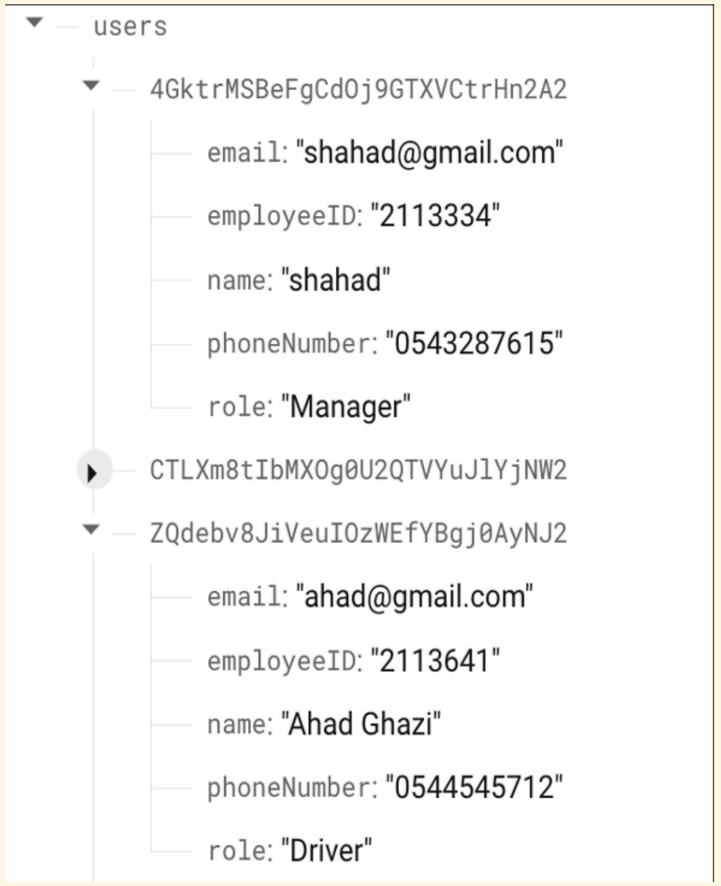
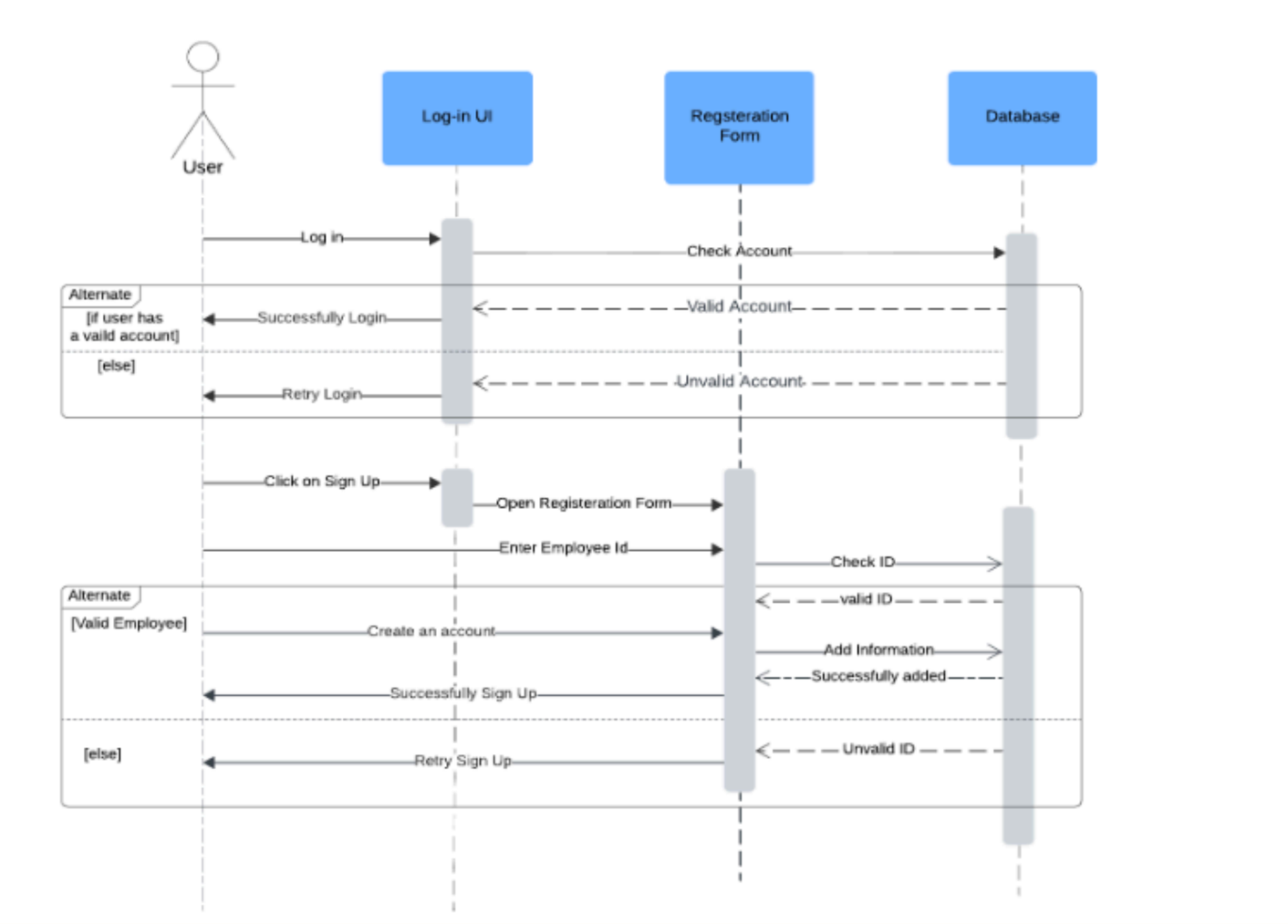

7:54
LOGIN
Employee Email
Password
Forgot Password?
Login
Register with us!

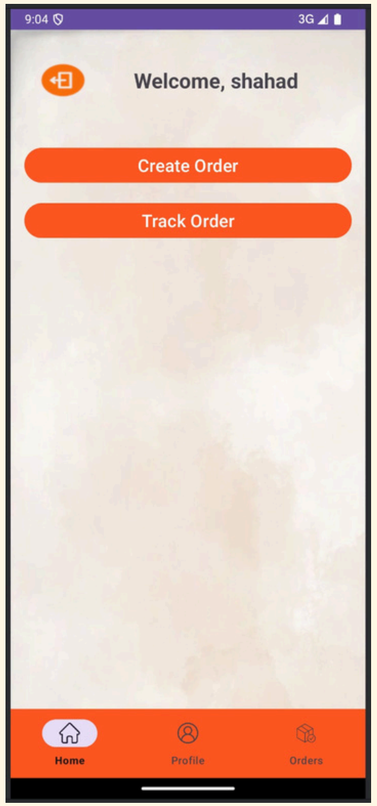

7:56
Create Your Account
Full Name
Employee ID
Phone Number
Email Address
Password
Choose Role:
Manager
Driver
Register

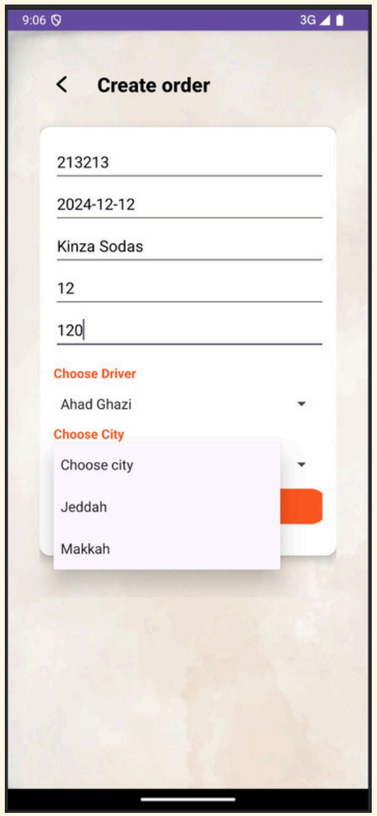

users
4GktrMSBeFgCdOj9GTXVCtrHn2A2
email: "shahad@gmail.com"
employeeID: "2113334"
name: "shahad"
phoneNumber: "0543287615"
role: "Manager"
CTLXm8tIbMXOg0U2QTVYuJlYjNW2
ZQdebv8JiVeuIOzWEfYBgj0AyNJ2
email: "ahad@gmail.com"
employeeID: "2113641"
name: "Ahad Ghazi"
phoneNumber: "0544545712"
role: "Driver"

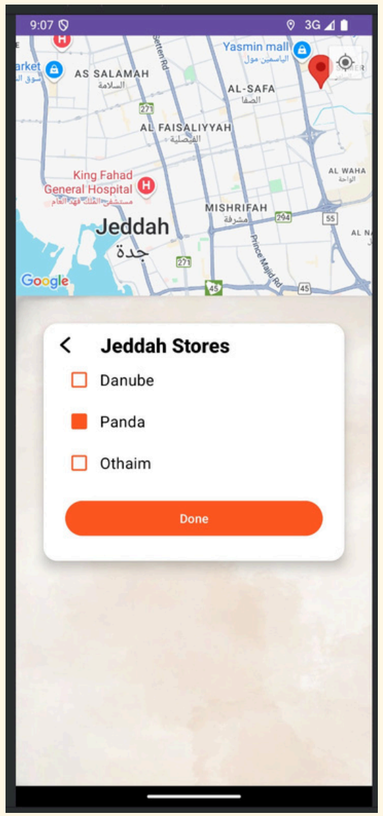
Sequence Diagram

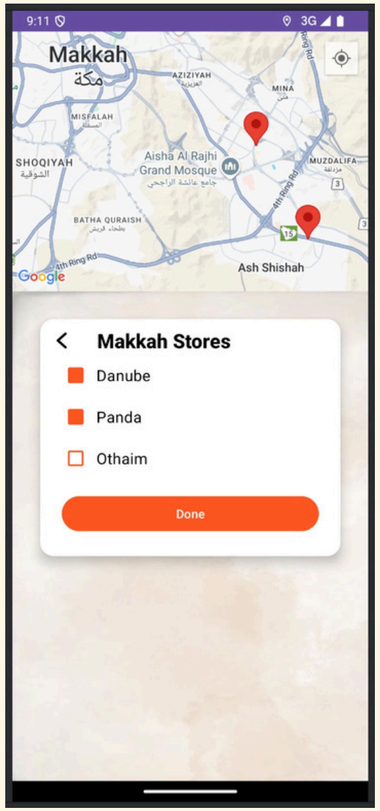


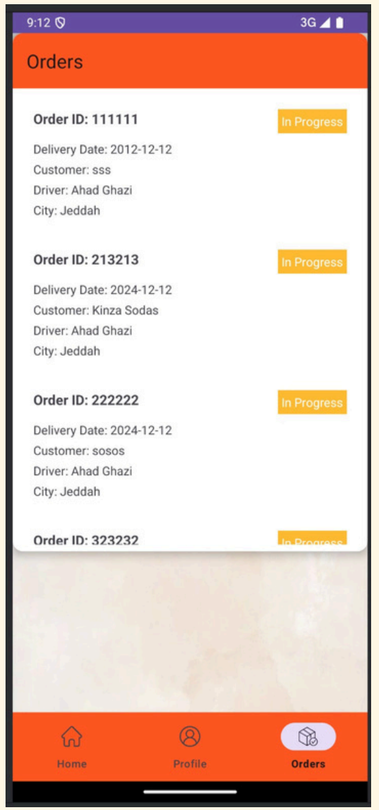
Sprint 2

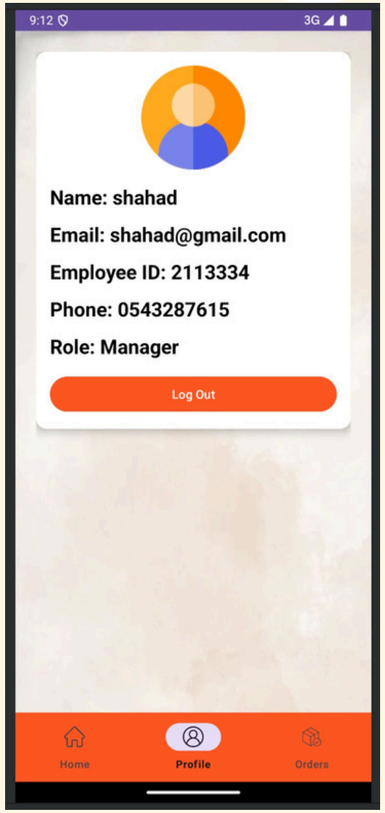

Welcome, shahad
Create Order
Track Order
Home
Profile
Orders


Create order
213213
2024-12-12
Kinza Sodas
12
120
Choose Driver
Ahad Ghazi
Choose City
Choose city
Jeddah
Makkah

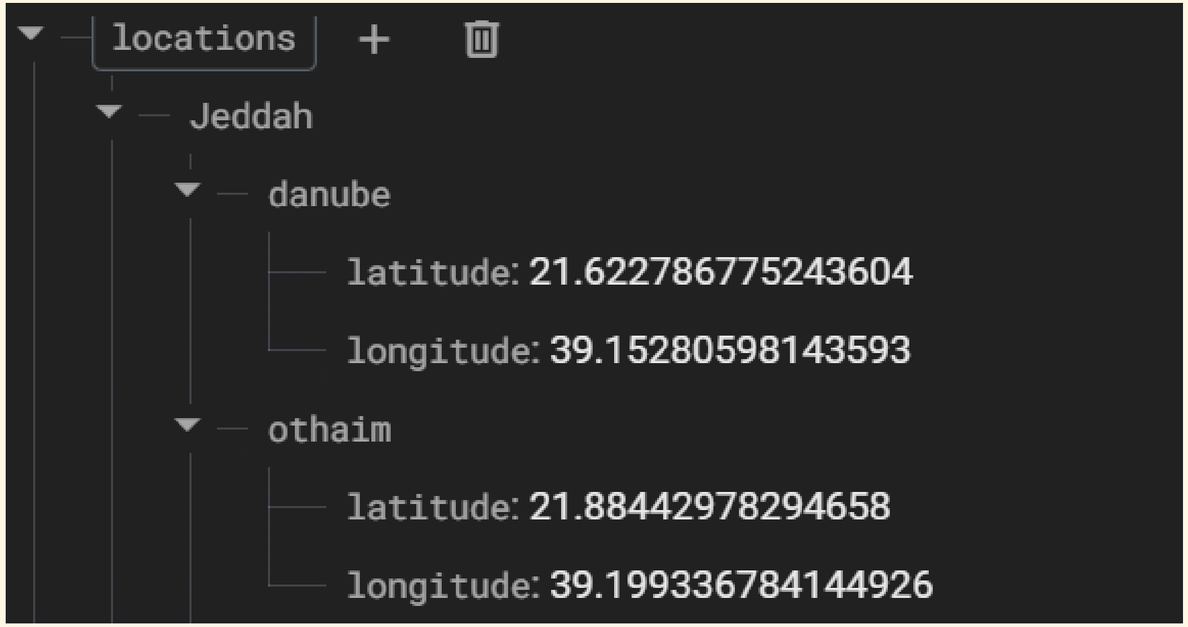

Jeddah Stores
Danube
Panda
Othaim
Done

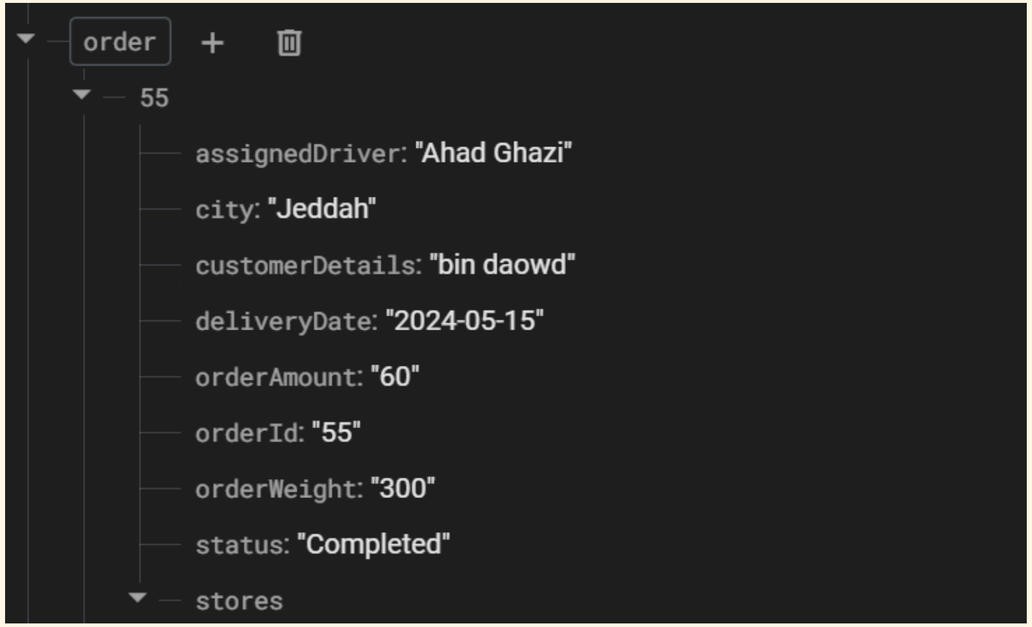

Makkah Stores
Danube
Panda
Othaim
Done


Orders
Order ID: 111111
In Progress
Delivery Date: 2012-12-12
Customer: sss
Driver: Ahad Ghazi
City: Jeddah
Order ID: 213213
In Progress
Delivery Date: 2024-12-12
Customer: Kinza Sodas
Driver: Ahad Ghazi
City: Jeddah
Order ID: 222222
In Progress
Delivery Date: 2024-12-12
Customer: sosos
Driver: Ahad Ghazi
City: Jeddah
Home
Profile
Orders

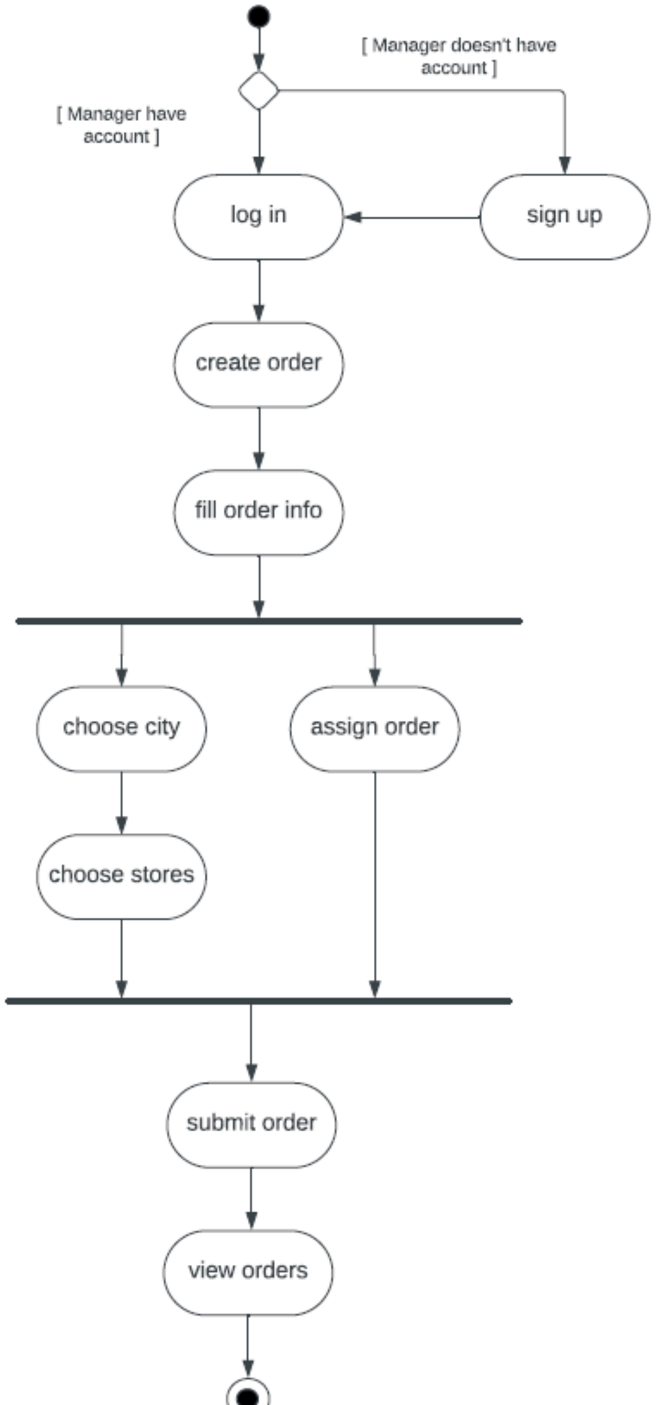

Name: shahad
Email: shahad@gmail.com
Employee ID: 2113334
Phone: 0543287615
Role: Manager
Log Out
Home
Profile
Orders

Sprint 2

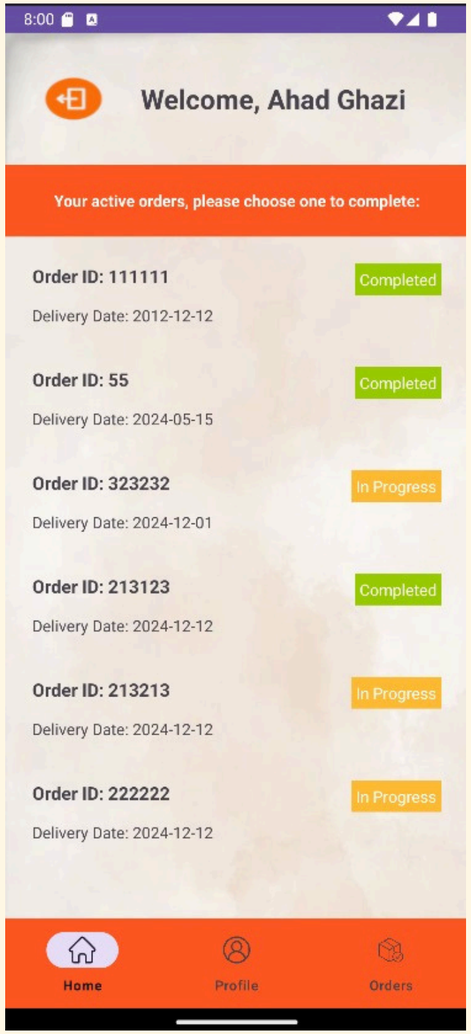

locations
Jeddah
danube
latitude: 21.622786775243604
longitude: 39.15280598143593
othaim
latitude: 21.88442978294658
longitude: 39.199336784144926

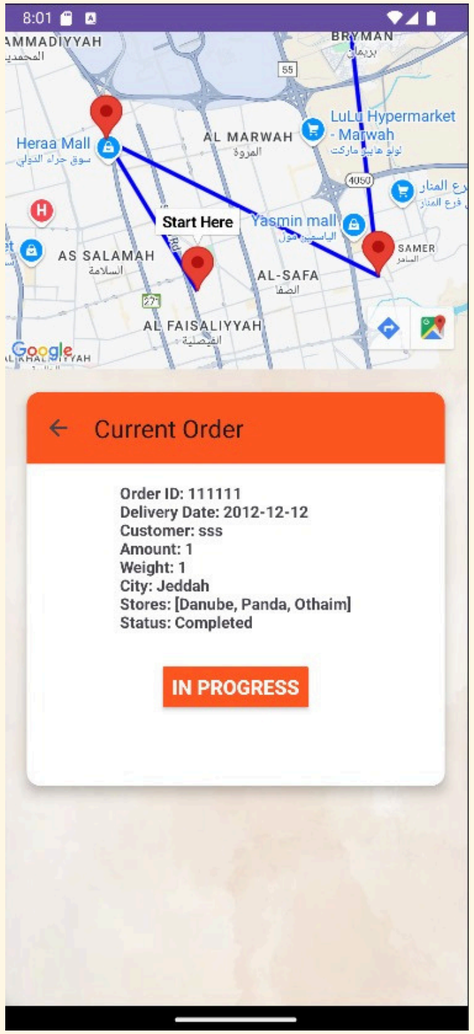

order
55
assignedDriver: "Ahad Ghazi"
city: "Jeddah"
customerDetails: "bin daowd"
deliveryDate: "2024-05-15"
orderAmount: "60"
orderId: "55"
orderWeight: "300"
status: "Completed"
stores

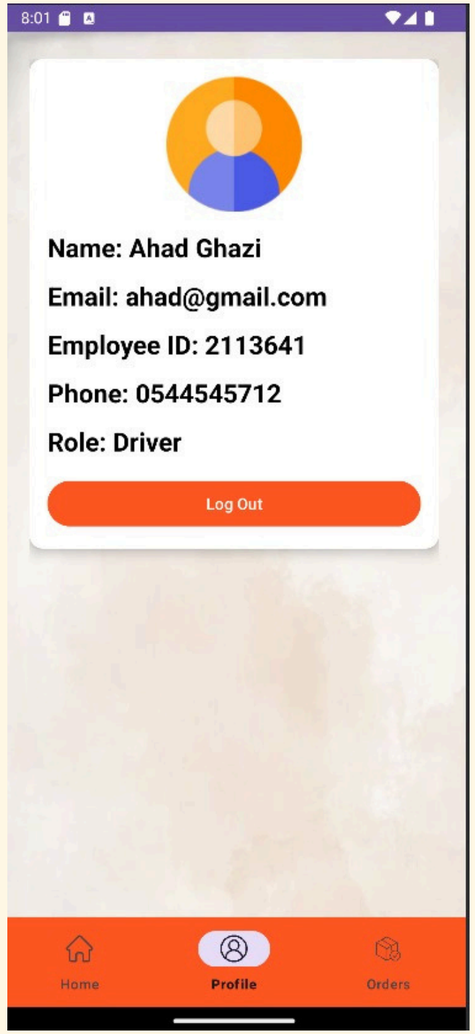
Activity Diagram



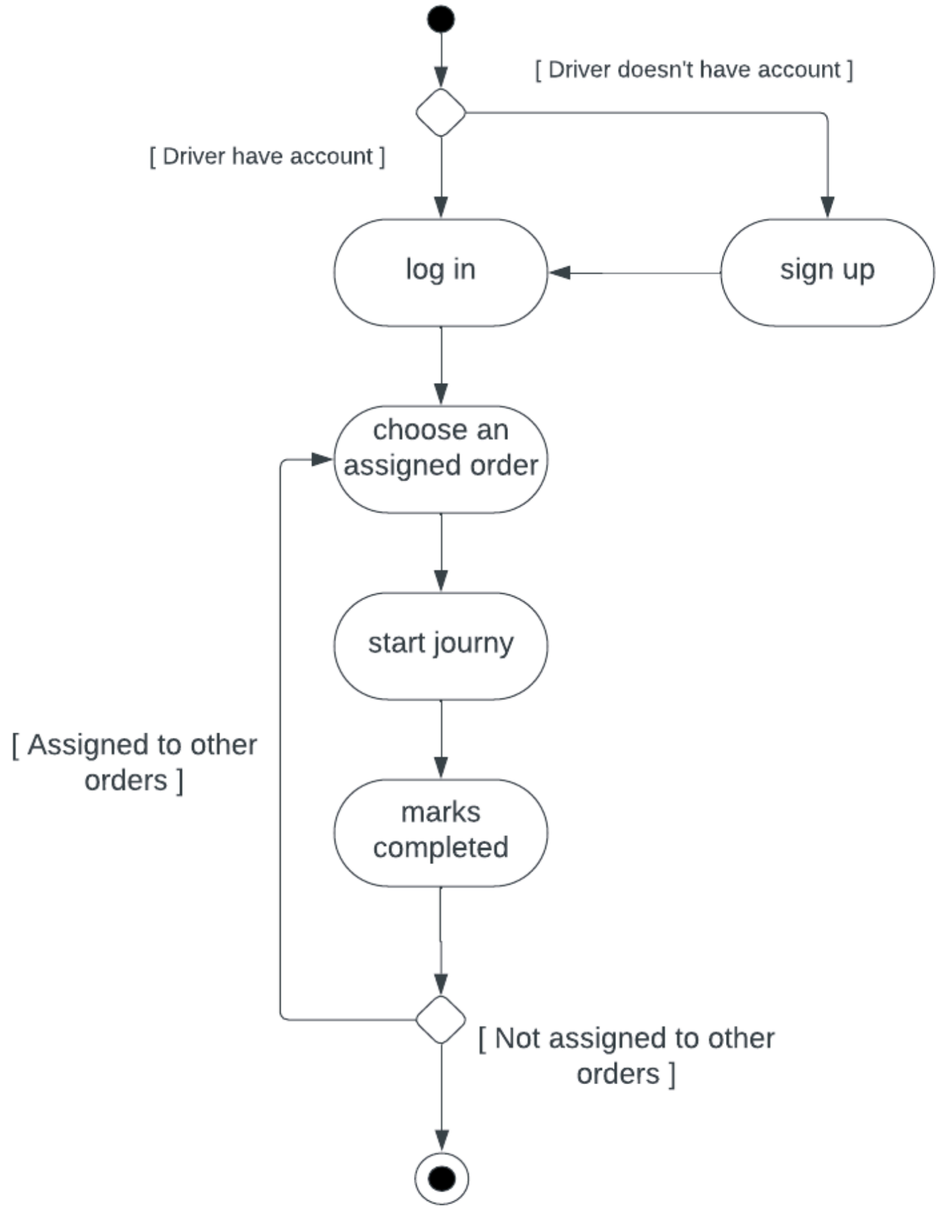
Sprint 3


8:00
Welcome, Ahad Ghazi
Your active orders, please choose one to complete:
Order ID: 111111
Completed
Delivery Date: 2012-12-12
Order ID: 55
Completed
Delivery Date: 2024-05-15
Order ID: 323232
In Progress
Delivery Date: 2024-12-01
Order ID: 213123
Completed
Delivery Date: 2024-12-12
Order ID: 213213
In Progress
Delivery Date: 2024-12-12
Order ID: 222222
In Progress
Delivery Date: 2024-12-12
Home
Profile
Orders


8:01
Heraa Mall
AL MARWAH
LuLu Hypermarket - Marwah
Start Here
Yasmin mall
AS SALAMAH
AL-SAFA
SAMER
AL FAISALIYYAH
Current Order
Order ID: 111111
Delivery Date: 2012-12-12
Customer: sss
Amount: 1
Weight: 1
City: Jeddah
Stores: [Danube, Panda, Othaim]
Status: Completed
IN PROGRESS


8:01
Name: Ahad Ghazi
Email: ahad@gmail.com
Employee ID: 2113641
Phone: 0544545712
Role: Driver
Log Out
Home
Profile
Orders

Activity Diagram



KEY CHALLENGE:
GOOGLE MAPS API INTEGRATION

One of the major challenges we faced was integrating the Google Maps Directions API. While we successfully connected the app and calculated distances between delivery points, we encountered a critical limitation:

- Optimal Path Issue: The API did not display the most efficient routes on the actual map, impacting our ability to provide accurate route visualization.
- Subscription Requirement: Unlocking advanced routing features required a paid subscription, which limited our testing and validation capabilities during development.

This challenge highlighted the importance of balancing functionality and cost while working with third-party services, driving us to explore alternative solutions and consider scalability for future implementation.

Thank you for listening!