**Part 1: Identify Entities & Relationships**

**Task 1: List Core Entities**

 **User**

• Includes three types of users, namely Customer, Driver, and Admin

 **Ride**  
• Represents travel bookings made by customers and accepted by drivers.

 **Vehicle**

• vehicle used by drivers to carry out services.

 **Payment**

• Record payment information made for each ride.

 **Rating**

• Provide a rating system between customers and drivers after the ride is completed

**Task 2: Define Attributes**

1. **User**

|  |
| --- |
|  \_id (ObjectId) – ID for each user   name (String) – user name   email (String, unique) – email   password (String) – users password   phoneNumber (String) – users phone number   role (String) – User role customer/driver/admin   createdAt (Date) – user register date |

1. **Ride**

|  |
| --- |
| * \_id (ObjectId) – Unique ID for each ride. * customerId (ObjectId → User) – ID of the user who made the booking. * driverId (ObjectId → User) – ID of the driver who accepted the booking. * pickupLocation (Object: { lat: Number, lng: Number }) – Starting location. * destination (Object: { lat: Number, lng: Number }) – Destination location. * status (String) – Ride status: "requested", "accepted", "in\_progress", "completed", "cancelled". * fare (Number) – Fare amount. * createdAt (Date) – Date and time the booking was made. |

1. **Vehicle**

|  |
| --- |
| * \_id (ObjectId) – Unique ID for each vehicle. * driverId (ObjectId → User) – ID of the driver who owns the vehicle. * plateNumber (String) – Vehicle plate number. * model (String) – Vehicle model. * color (String) – Vehicle color. * type (String) – Type of vehicle: "car", "motorcycle". * year (Number) – Vehicle manufacturing year. |

1. **Payment**

|  |
| --- |
| * \_id (ObjectId) – Unique ID for each payment. * rideId (ObjectId → Ride) – ID of the related ride. * amount (Number) – Payment amount. * paymentMethod (String) – Payment method: "credit\_card", "cash", "e-wallet". * paymentStatus (String) – Payment status: "pending", "completed", "failed". * paidAt (Date) – Payment date. |

1. **Rating**

|  |
| --- |
| * \_id (ObjectId) – Unique ID for each rating. * rideId (ObjectId → Ride) – ID of the ride being rated. * givenBy (ObjectId → User) – User who gave the rating. * givenTo (ObjectId → User) – User who received the rating. * score (Number) – Rating score (1 to 5). * comment (String) – Additional comments or feedback. * createdAt (Date) – Date the rating was given. |

**Task 3: Model Relationships Decide how entities relate (example):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Original Entity** | **Related Entity** | **Relationship Type** | **Description** |
| User | Ride | One to Many | One customer can book many ride |
| User(driver) | Ride | One to Many | One driver can accept and doing many ride |
| User (driver) | vehicle | One to One | Each driver have only one vehicle |
| Ride | Payment | One to One | Each ride has one payment transaction. |
| Ride | Rating | One to Many | A ride can have multiple ratings (for example, the driver and customer give each other ratings). |

Additional notes:

* Users can be customers or drivers depending on their roles.
* Rides will start from pickupLocation and end at destination.
* Ratings are related to rides and two user parties: the giver (givenBy) and the receiver (givenTo).

**Part 2: Design the ERD   
Task 4: Draw the ERD**

**NURUL ANIS HAFIFZA BINTI AMRAN ( B122410321 )**

**1. ERD Diagram:**

**2. Schema Definitions:**

**List of collections, fields, and data types.**

|  |  |
| --- | --- |
| **User** | |
| **Field** | **Data Types** |
| **\_id** | **(ObjectId)** |
| **email** | **(String, unique)** |
| **password** | **(String)** |
| **role** | **(String: “customer” , “driver” , “admin”** |

|  |  |
| --- | --- |
| **Rides** | |
| **Field** | **Data Types** |
| **\_id** | **(ObjectId)** |
| **customer\_id** | **(ObjectId -> customer)** |
| **pickup** |  |
| **destination** |  |

|  |  |
| --- | --- |
| **Earnings** | |
| **Field** | **Data Types** |
| **\_id** | **(ObjectId)** |
| **driver\_id** |  |
| **ride\_id** |  |
| **amount** |  |

|  |  |
| --- | --- |
| **Driver availability** | |
| **Field** | **Data Types** |
| **Availability\_id** | **(ObjectId)** |
| **driver\_id** |  |
| **Is\_available** |  |

|  |  |
| --- | --- |
| **vehicle** | |
| **Field** | **Data Types** |
| **\_id** | **(ObjectId)** |
| **driver\_id** |  |
| **plateNumber** |  |
| **model** |  |
| **color** |  |