

FLEET MANAGEMENT SYSTEM

ENTITIES:-

- 1.Owner
- 2.Vehicle
- 3.Driver
- 4.Route
- 5.Maintenance
- 6.Incident
- 7.Fuel
- 8.Trip
- 9.Schedule
- 10.Customer
- 11.Payment
- 12.Invoice
- 13.Insurance
- 14.ServiceRequest
- 15.Feedback

1.Owner:

Field	Fieldtype	Constraints	Description
Owner ID	Integer	Primary key	Primary key for the owner records
Name	Varchar	Not null	Full name of the owner
Contact Info	Varchar	Not null	Owner's phone number or email
Address	Varchar	Not null	Residential or business address

2.Vehicle:

Field	Fieldtype	Constraints	Description
Vehicle ID	Integer	Primary key	Primary key for the vehicle
Vehicle Number	Varchar	Not null	Unique identifier for the vehicle
Vehicle Type	Integer	Foreign key	Foreign key to vehicle type table
model	Varchar	Not null	Vehicle model
Year of Manufacture	Year	Not null	Year the vehicle was manufactured
Capacity	Integer	Not null	Vehicle's carrying capacity
Status	Enum	Check	Available, In service, Out of service
Sitting members	Integer	Not null	The number of people the vehicle can accommodate in its sitting area.
Owner Id	Integer	Foreign key	A unique identifier linking the vehicle to its owner in the owner table.

3.Driver:

Field	Fieldtype	Constraints	Description
Driver ID	Integer	Primary key	Primary key for the driver
Name	Varchar	Not null	Full name of the driver
License Number	Varchar	Not null	Driver's licence number
Contact Information	Varchar	Not null	Driver's phone number or email
Experience	Integer	Not null	Number of years of driving experience

Vehicle Id	Integer	Foreign Key	Foreign key to vehicle table
Status	Enum	Check	Active, Inactive

4.Route:

Field	Fieldtype	Constraints	Description
Route Id	Integer	Primary key	Primary key for the route
Route Name	Varchar	Not null	Name of the route
Start Location	Varchar	Not null	Starting point of the route
End Location	Varchar	Not null	End point of the route
Distance	Decimal	Not null	Distance of the route in km
Estimated Time	Time	Not null	Approximate time for the trip

5.Maintenance:

Field	Fieldtype	Constraints	Description
Maintenance ID	Integer	Primary key	Primary key for the Maintenance records
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
Maintenance Date	Date	Not null	Date of maintenance
Description	Varchar	Not null	Details of the maintenance activity
Status	Enum	check	Active,Inactive
Cost	Decimal	Not null	Total cost of maintenance

6.Incident:

Field	Fieldtype	Constraints	Description
Incident ID	Integer	Primary key	Primary key for the incident records
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
Driver ID	Integer	Foreign	Foreign Key to Driver table
Description	Varchar	Not null	Details of the incident
Date	Date	Not null	Date of the incident
Status	Enum	Check	Reported, Under investigation, Resolved

7.Fuel

Field	Fieldtype	Constraints	Description
Fuel ID	Integer	Primary key	Primary key for the fuel records
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
Fuel Type	Varchar	Not null	Type of fuel(e.g., Diesel, Petrol)
Quantity	Decimal	Not null	Amount of fuel purchased(in liters)
Cost	Decimal	Not null	Total cost of fuel
Date of Purchase	Date	Not null	Date of fuel purchase

8.Trip

Field	Fieldtype	Constraints	Description
Trip ID	Integer	Primary key	Primary key for trip records

Vehicle ID	Integer	Foreign key	Foreign key to Vehicle table
Route ID	Integer	Foreign key	Foreign key to Route table
driver ID	Integer	Foreign key	Foreign key to Driver table
Distance travelled	Decimal	Not null	Total distance covered during the trip
Start time	Time	Not null	Start time of the trip
End time	Time	Not null	End time of the trip
Amount	Integer	Not null	Primary
No of passengers	Integer	Not null	Primary
Date	Date	Not null	Primary

9.Schedule:

Field	Fieldtype	Constraints	Description
Schedule ID	Integer	Primary key	Primary key for the schedule records
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
Driver ID	Integer	Foreign key	Foreign key to driver table
Trip ID	Integer	Foreign key	Foreign key to trip table
Date	Date	Not null	Date of the schedule trip
Start Time	Time	Not null	Start time of the schedule trip

Field	Fieldtype	Constraints	Description
Schedule ID	Integer	Primary key	Primary key for the schedule records
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
End Time	Time	Not null	End time of the schedule trip

10.Customer:

Field	Fieldtype	Constraints	Description
Customer ID	Integer	Primary key	Primary key for the customer records
Name	Varchar	Not null	Full name of the customer
Contact information	Varchar	Not null	Customer's phone number or email
Email Id	Varchar	Not null	The email address of the customer,used for identification and communication purposes.
Date of birth	Date	Not null	Used for age validation
Identity card	Varchar	Not null	A unique number used to verify the customer's identity
Address	Varchar	Not null	Address of the customer

11.Payment:

Field	Fieldtype	Constraints	Description
Payment ID	Integer	Primary key	Primary key for the payment records.

Trip ID	Integer	Foreign key	Foreign key to trip table
Amount	Decimal	Not null	Amount paid
Payment Date	Date	Not null	Date of the payment
Payment Method	Enum	Check	Cash,Credit card,etc.

12.Invoice:

Field	Fieldtype	Constraints	Description
Invoice ID	Integer	Primary key	Primary key for the invoice records
Trip ID	Integer	Foreign key	Foreign key to trip table
Customer ID	Integer	Foreign key	Foreign key to customer table
Amount	Decimal	Not null	Invoice Amount
Invoice Date	Date	Not null	Date of the invoice

13.Insurance:

Field	Fieldtype	Constraints	Description
Insurance ID	Integer	Primary key	Primary key for the insurance records
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
Provider Name	Varchar	Not null	Name of the insurance provider
Policy Number	Varchar	Not null	Insurance policy number
Expiration Date	Date	Not null	Policy expiration date

Coverage Amount	Decimal	Not null	Coverage amount of the insurance
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14.ServiceRequest:

Field	Fieldtype	Constraints	Description
ServiceRequest ID	Integer	Primary key	Primary key for the service requests
Vehicle ID	Integer	Foreign key	Foreign key to vehicle table
Request Date	Date	Not null	Date of the service request
Description	Varchar	Not null	Description of the service request
Status	Enum	check	Pending,In progress,completed

15.Feedback:

Field	Fieldtype	Constraints	Description
Feedback ID	Integer	Primary key	Primary key for the feedback
Trip ID	Integer	Foreign key	Foreign key to trip table
Customer ID	Integer	Foreign key	Foreign key to customer table
Rating	Integer	Check	Rating given by the customer(1-5)
Comments	Varchar	Not null	Additional comments from the customer

Relationships:

***Owner Relationships:-**

1. Owner and Vehicle:

Relationship:One-to-Many

Explanation:One owner can own multiple vehicles, but each vehicle is owned by a single owner.

1. Owner and Insurance:

Relationship:One-to-Many

Explanation:An owner can have multiple insurance policies (one for each vehicle they own).

1. Owner and Maintenance:

Relationship:One-to-Many

Explanation:Each owner is responsible for maintaining their vehicles.

1. Owner and Fuel:

Relationship:One-to-Many

Explanation:Each owner is responsible for fueling their vehicles.

***.Vehicle Relationship:-**

1.Vehicle and Vehicle Type:

Relationship:One-to many

Explanation:Each vehicle belongs to one vehicle type, but a single vehicle type (e.g., Truck, Bus) can be assigned to multiple vehicles.

2.Vehicle and Maintenance:

Relationship:One-to many

Explanation: A vehicle may require multiple maintenance activities over time, but each maintenance record is linked to a single vehicle.

3.Vehicle and Fuel:

Relationship:One-to many

Explanation: A single vehicle may have multiple fuel transactions, but each fuel record belongs to one vehicle.

4.Vehicle and Incident:

Relationship:One-to many

Explanation: A vehicle may be involved in multiple incidents, but each incident is tied to a single vehicle.

5.Vehicle and ServiceRequest:

Relationship:One-to many

Explanation: A vehicle can have multiple service requests, but each service request is associated with one vehicle.

6.Insurance and Vehicle:

Relationship:One-to one

Explanation:Each vehicle is covered by one insurance policy, and each insurance policy covers one vehicle.

7.Vehicle and Trip:

Relationship:one-to many

Explanation:A vehicle can be used for multiple trips, but each trip involves one vehicle

***.Driver Relationships:-**

1.Driver and Schedule:

Relationship:One-to many

Explanation:A driver can be assigned to multiple schedules, but each schedule involves one driver.

2.Driver and Trip:

Relationship:one-to many

Explanation:A driver may drive for multiple trips, but each trip involves one driver.

***Trip relationships:-**

1.Trip and Payment:

Relationship:One-to One

Explanation:Each trip generates one payment, and each payment is associated with one trip.

2.Trip and Invoice:

Relationship:One-to One

Explanation:Each trip generates one invoice, and each invoice is associated with one trip.

3.Trip and Route:

Relationship:Many-to One

Explanation: Multiple trips can follow the same route, but each trip is linked to only one route.

***Customer relationships:-**

1.Customer and Invoice:

Relationship:One-to many

Explanation:A customer can receive multiple invoices, but each invoice is linked to one customer.

2.Customer and Feedback:

Relationship:One-to many

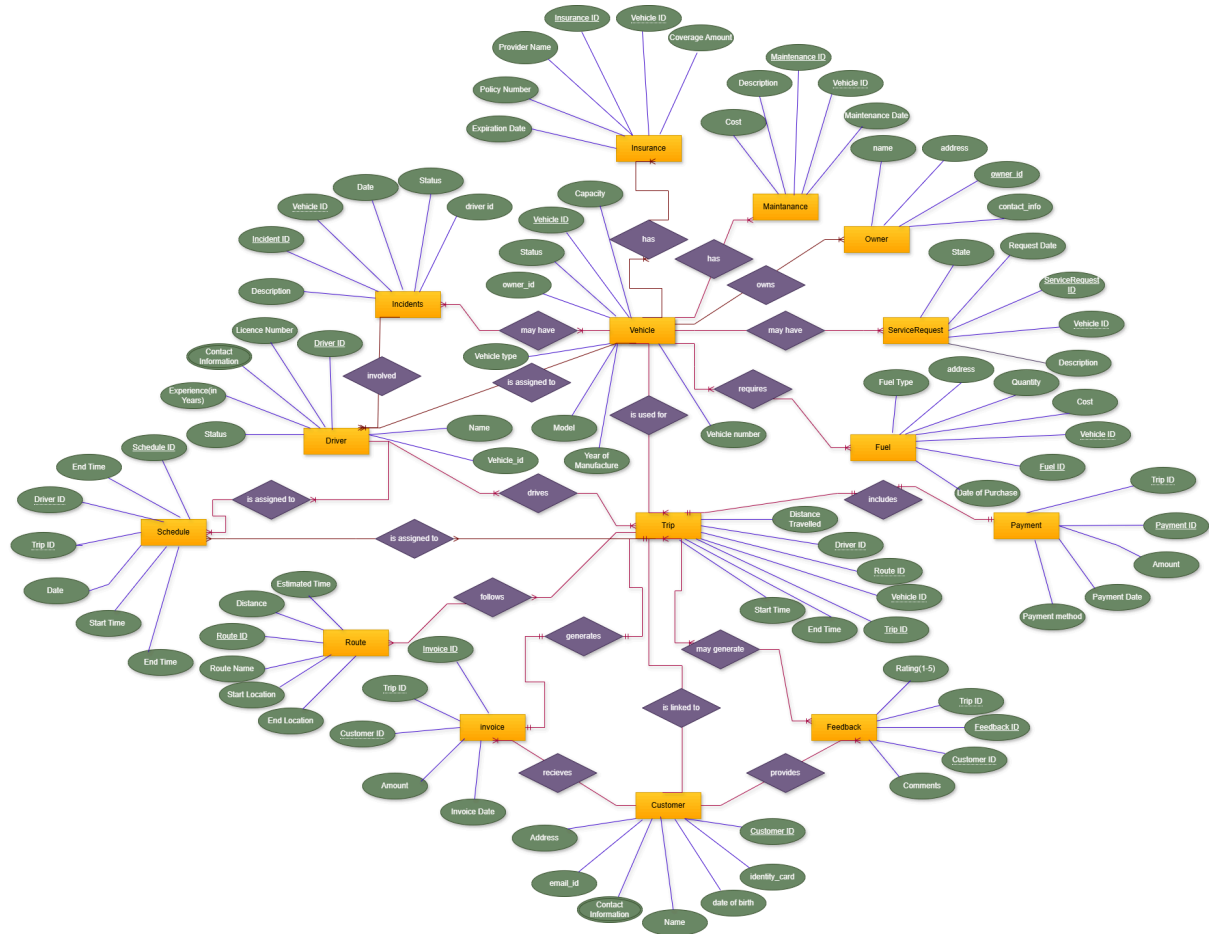
Explanation:A customer can provide feedback for multiple trips, but each feedback entry is linked to one customer.

3.Customer and Trip:

Relationship:One-to many

Explanation:A customer can book multiple trips, but each trip is linked to one customer.

Entity-Relationship Diagram:



Database design:

