**Vehicle Rental System**

**Tables:**

**The database consists of six main tables**

**Vehicles:** Contains unique records for each vehicle, including registration number, model, manufacturer, year, color, rental rate, and its current availability status.

**Customers:** Stores customer details including name, contact information, address, and their driving license numbers**.**

**Rentals:** Acts as a junction table linking Vehicles and Customers, recording rental dates, returns, total cost, and rental status to track ongoing and completed rentals**.**

**Payments:** Records all payment transactions tied to specific rentals, including payment date, amount, and payment method**.**

**Maintenance:** Logs maintenance activities performed on vehicles, including service descriptions, dates, and costs**.**

**RentalLog:** Automatically records every new rental creation for auditing purposes using triggers**.**

**Constraints:**

Each table uses an auto-increment primary key to uniquely identify records.

Primary Keys: Uniquely identify each record and automatically increment to avoid manual input errors.

Foreign Keys: Maintain references between tables preventing invalid joins.

ON DELETE CASCADE: Deleting a vehicle or customer cleans up all related rentals, payments, and maintenance records.

ON UPDATE CASCADE: When a rental is marked as completed, the vehicle status is automatically updated back to ‘Available’.

Triggers: Automate essential actions, such as updating vehicle availability when rentals are created or completed and logging rental events for audit trails.

**Vehicles Table**:

CREATE TABLE Vehicles (

VehicleID INT PRIMARY KEY AUTO\_INCREMENT,

RegistrationNumber VARCHAR(20) UNIQUE,

Model VARCHAR(50),

Manufacturer VARCHAR(50),

Year INT,

Color VARCHAR(30),

RentalRate DECIMAL(10,2),

AvailabilityStatus VARCHAR(20)

);**#inserting values into vehicles table**

INSERT INTO Vehicles (RegistrationNumber, Model, Manufacturer, Year, Color, RentalRate, AvailabilityStatus) VALUES

('KA01AB1234', 'Innova Crysta', 'Toyota', 2020, 'White', 3000.00, 'Available'),

('KA05XY6789', 'Swift Dzire', 'Maruti', 2019, 'Silver', 1500.00, 'Available'),

('KA08MN4321', 'Harley Davidson', 'Harley', 2021, 'Black', 5000.00, 'Rented'),

('KA11GH5678', 'Honda City', 'Honda', 2018, 'Red', 2500.00, 'Available'),

('KA12EF8899', 'Creta', 'Hyundai', 2022, 'Blue', 3500.00, 'Rented');

**Customers Table:**

CREATE TABLE Customers (

CustomerID INT PRIMARY KEY AUTO\_INCREMENT,

Name VARCHAR(100),

Phone VARCHAR(15),

Email VARCHAR(100),

Address VARCHAR(250),

DrivingLicenseNumber VARCHAR(30)

);

**#Inserting values into customers table**

INSERT INTO Customers (Name, Phone, Email, Address, DrivingLicenseNumber) VALUES

('Rajesh Kumar', '9876543210', 'rajesh@example.com', '12 MG Road, Bangalore', 'DL1234567890'),

('Anita Sharma', '9876501234', 'anita@example.com', '5th Cross, Bangalore', 'DL0987654321'),

('Surya M', '9845123456', 'surya@example.com', '8th Main, Mysore', 'DL5554443332'),

('Riya Sen', '9924456789', 'riya@example.com', 'BTM Layout, Bangalore', 'DL2468135790'),

('Karthik N', '9887654321', 'karthik@example.com', 'MG Road, Mangalore', 'DL1357924680');

**Rentals Table:**

CREATE TABLE Rentals (

RentalID INT PRIMARY KEY AUTO\_INCREMENT,

VehicleID INT,

CustomerID INT,

RentalDate DATE,

ReturnDate DATE,

TotalCost DECIMAL(10,2),

Status VARCHAR(20),

FOREIGN KEY (VehicleID) REFERENCES Vehicles(VehicleID)

ON DELETE CASCADE

ON UPDATE CASCADE,

FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)

ON DELETE CASCADE

ON UPDATE CASCADE

);

**#inserting values into rentals table**

INSERT INTO Rentals (VehicleID, CustomerID, RentalDate, ReturnDate, TotalCost, Status) VALUES

(1, 1, '2025-08-10', '2025-08-15', 15000.00, 'Completed'),

(3, 2, '2025-08-14', NULL, 10000.00, 'Ongoing'),

(2, 3, '2025-08-05', '2025-08-10', 7500.00, 'Completed'),

(4, 4, '2025-08-12', '2025-08-16', 10000.00, 'Completed'),

(5, 5, '2025-08-15', NULL, 14000.00, 'Ongoing');

**Payments table:**

CREATE TABLE Payments (

PaymentID INT PRIMARY KEY AUTO\_INCREMENT,

RentalID INT,

PaymentDate DATE,

Amount DECIMAL(10,2),

PaymentMethod VARCHAR(20),

FOREIGN KEY (RentalID) REFERENCES Rentals(RentalID)

ON DELETE CASCADE

ON UPDATE CASCADE

);

**Inserting values into payments table**

INSERT INTO Payments (RentalID, PaymentDate, Amount, PaymentMethod) VALUES

(1, '2025-08-10', 15000.00, 'Credit Card'),

(2, '2025-08-14', 10000.00, 'Cash'),

(3, '2025-08-05', 7500.00, 'UPI'),

(4, '2025-08-12', 10000.00, 'Debit Card'),

(5, '2025-08-15', 14000.00, 'Credit Card');

**Maintenance Table:**

CREATE TABLE Maintenance (

MaintenanceID INT PRIMARY KEY AUTO\_INCREMENT,

VehicleID INT,

ServiceDate DATE,

Description VARCHAR(200),

Cost DECIMAL(10,2),

FOREIGN KEY (VehicleID) REFERENCES Vehicles(VehicleID)

ON DELETE CASCADE

ON UPDATE CASCADE

);

**Inserting values into maintenance table**

Insert into Maintenance (VehicleID, ServiceDate, Description, Cost) VALUES

(1, '2025-07-01', 'Engine servicing', 5000.00),

(2, '2025-06-20', 'Oil change', 1500.00),

(3, '2025-07-15', 'Tyre replacement', 3500.00),

(4, '2025-07-20', 'Battery check', 1200.00),

(5, '2025-07-25', 'AC repair', 2800.00);

**Rental Log table**

CREATE TABLE RentalLog (

LogID INT PRIMARY KEY AUTO\_INCREMENT,

RentalID INT,

LogDate TIMESTAMP DEFAULT CURRENT\_TIMESTAMP

);

**Triggers:**

DELIMITER //

#Trigger to log rental creation

CREATE TRIGGER AfterRentalInsert

AFTER INSERT ON Rentals

FOR EACH ROW

BEGIN

INSERT INTO RentalLog (RentalID) VALUES (NEW.RentalID);

END;

//

#Trigger to set vehicle availability status to 'Rented' when a rental is made

CREATE TRIGGER SetVehicleRented

AFTER INSERT ON Rentals

FOR EACH ROW

BEGIN

UPDATE Vehicles

SET AvailabilityStatus = 'Rented'

WHERE VehicleID = NEW.VehicleID;

END;

//

#Trigger to set vehicle availability status to 'Available' when rental status is updated to 'Completed'

CREATE TRIGGER SetVehicleAvailable

AFTER UPDATE ON Rentals

FOR EACH ROW

BEGIN

IF NEW.Status = 'Completed' THEN

UPDATE Vehicles

SET AvailabilityStatus = 'Available'

WHERE VehicleID = NEW.VehicleID;

END IF;

END;

//

DELIMITER ;

**Relationships:**

Vehicle → Rentals → One Vehicle can have many rentals.

Customer → Rentals → One Customer can make many rentals.

Rental → Payments → One Rental can have many payments.

Vehicle → Maintenance → One Vehicle can have many maintenance records.

Rental → RentalLog → Each Rental can have many logs

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