```sql
--Coding Challenge - Car Rental System - SQL

CREATE DATABASE VehicleLeasingDB;
USE VehicleLeasingDB;

-- Vehicle Table
CREATE TABLE Vehicle (
    carID INT PRIMARY KEY IDENTITY(1,1),
    make VARCHAR(50) NOT NULL,
    model VARCHAR(50) NOT NULL,
    year INT NOT NULL,
    dailyRate DECIMAL(10,2) NOT NULL,
    status VARCHAR(20) CHECK (status IN ('available',
'notAvailable')),
    passengerCapacity INT NOT NULL,
    engineCapacity INT NOT NULL
);


-- Customer Table
CREATE TABLE Customer (
    customerID INT PRIMARY KEY IDENTITY(1,1),
    firstName VARCHAR(50) NOT NULL,
    lastName VARCHAR(50) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    phoneNumber VARCHAR(15) UNIQUE NOT NULL
);


-- Lease Table
CREATE TABLE Lease (
    leaseID INT PRIMARY KEY IDENTITY(1,1),
    carID INT NOT NULL,
    customerID INT NOT NULL,
    startDate DATE NOT NULL,
    endDate DATE NOT NULL,
    leaseType VARCHAR(20) CHECK (leaseType IN ('Daily',
'Monthly')),
    FOREIGN KEY (carID) REFERENCES Vehicle(carID) ,
    FOREIGN KEY (customerID) REFERENCES Customer(customerID)
);


-- Payment Table
CREATE TABLE Payment (
    paymentID INT PRIMARY KEY IDENTITY(1,1),
    leaseID INT NOT NULL,
    paymentDate DATE NOT NULL,
    amount DECIMAL(10,2) NOT NULL,
    FOREIGN KEY (leaseID) REFERENCES Lease(leaseID)
);
```

```sql
--Inserting into Vehicle Table

INSERT INTO Vehicle (make, model, year, dailyRate, status,
passengerCapacity, engineCapacity)
VALUES
('Toyota', 'Camry', 2022, 50.00, 'available', 4, 1450),
('Honda', 'Civic', 2023, 45.00, 'available', 7, 1500),
('Ford', 'Focus', 2022, 48.00, 'notAvailable', 4, 1400),
('Nissan', 'Altima', 2023, 52.00, 'available', 7, 1200),
('Chevrolet', 'Malibu', 2022, 47.00, 'available', 4, 1800),
('Hyundai', 'Sonata', 2023, 49.00, 'notAvailable', 7, 1400),
('BMW', '3 Series', 2023, 60.00, 'available', 7, 2499),
('Mercedes', 'C-Class', 2022, 58.00, 'available', 8, 2599),
('Audi', 'A4', 2022, 55.00, 'notAvailable', 4, 2500),
('Lexus', 'ES', 2023, 54.00, 'available', 4, 2500);

--Inserting into Customer Table

INSERT INTO Customer (firstName, lastName, email, phoneNumber)
VALUES
('John', 'Doe', 'johndoe@example.com', '555-555-5555'),
('Jane', 'Smith', 'janesmith@example.com', '555-123-4567'),
('Robert', 'Johnson', 'robert@example.com', '555-789-1234'),
('Sarah', 'Brown', 'sarah@example.com', '555-456-7890'),
('David', 'Lee', 'david@example.com', '555-987-6543'),
('Laura', 'Hall', 'laura@example.com', '555-234-5678'),
('Michael', 'Davis', 'michael@example.com', '555-876-5432'),
('Emma', 'Wilson', 'emma@example.com', '555-432-1098'),
('William', 'Taylor', 'william@example.com', '555-321-6547'),
('Olivia', 'Adams', 'olivia@example.com', '555-765-4321');

SELECT * FROM Vehicle;

--Inserting into Lease Table

INSERT INTO Lease (carID, customerID, startDate, endDate,
leaseType)
VALUES
(1, 1, '2023-01-01', '2023-01-05', 'Daily'),
(2, 2, '2023-02-15', '2023-02-28', 'Monthly'),
(3, 3, '2023-03-10', '2023-03-15', 'Daily'),
(4, 4, '2023-04-20', '2023-04-30', 'Monthly'),
(5, 5, '2023-05-05', '2023-05-10', 'Daily'),
(4, 3, '2023-06-15', '2023-06-30', 'Monthly'),
(7, 7, '2023-07-01', '2023-07-10', 'Daily'),
(8, 8, '2023-08-12', '2023-08-15', 'Monthly'),
(3, 3, '2023-09-07', '2023-09-10', 'Daily'),
(10, 10, '2023-10-10', '2023-10-31', 'Monthly');
```

```sql
--Inserting into Payment Table

INSERT INTO Payment (leaseID, paymentDate, amount)
VALUES
(1, '2023-01-03', 200.00),
(2, '2023-02-20', 1000.00),
(3, '2023-03-12', 75.00),
(4, '2023-04-25', 900.00),
(5, '2023-05-07', 60.00),
(6, '2023-06-18', 1200.00),
(7, '2023-07-03', 40.00),
(8, '2023-08-14', 1100.00),
(9, '2023-09-09', 80.00),
(10, '2023-10-25', 1500.00);

--1. Update the daily rate for a Mercedes car to 68.

UPDATE Vehicle SET dailyRate=68 WHERE make='Mercedes';
SELECT * FROM Vehicle;
```

Results Messages

	carID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity
1	1	Toyota	Camry	2022	50.00	available	4	1450
2	2	Honda	Civic	2023	45.00	available	7	1500
3	3	Ford	Focus	2022	48.00	notAvailable	4	1400
4	4	Nissan	Altima	2023	52.00	available	7	1200
5	5	Chevrolet	Malibu	2022	47.00	available	4	1800
6	6	Hyundai	Sonata	2023	49.00	notAvailable	7	1400
7	7	BMW	3 Series	2023	60.00	available	7	2499
8	8	Mercedes	C-Class	2022	68.00	available	8	2599
9	9	Audi	A4	2022	55.00	notAvailable	4	2500
10	10	Lexus	ES	2023	54.00	available	4	2500

```sql
--2. Delete a specific customer and all associated leases and
payments.

DELETE FROM Payment
WHERE leaseID IN (SELECT leaseID FROM Lease WHERE customerID = 3);
DELETE FROM Lease
WHERE customerID = 3
DELETE FROM Customer
WHERE customerID = 3;

SELECT * FROM Customer WHERE customerID = 3;
SELECT * FROM Lease WHERE customerID = 3;
SELECT * FROM Payment WHERE leaseID NOT IN (SELECT leaseID FROM
Lease);
```

Results Messages

	customerID	firstName	lastName	email	phoneNumber

	leaseID	carID	customerID	startDate	endDate	leaseType

	paymentID	leaseID	transactionDate	amount

```sql
--3. Rename the "paymentDate" column in the Payment table to "transactionDate".

EXEC sp_rename 'Payment.paymentDate', 'transactionDate', 'COLUMN';
SELECT * FROM Payment;
```

Results Messages

	paymentID	leaseID	transactionDate	amount
1	1	1	2023-01-03	200.00
2	2	2	2023-02-20	1000.00
3	4	4	2023-04-25	900.00
4	5	5	2023-05-07	60.00
5	7	7	2023-07-03	40.00
6	8	8	2023-08-14	1100.00
7	10	10	2023-10-25	1500.00

```sql
--4. Find a specific customer by email.

SELECT * FROM Customer WHERE email='johndoe@example.com';
```

Results Messages

	customerID	firstName	lastName	email	phoneNumber
1	1	John	Doe	johndoe@example.com	555-555-5555

```sql
--5. Get active leases for a specific customer.

SELECT * FROM Lease
WHERE customerID = 3 AND endDate >= GETDATE();
```

Results Messages

	leaseID	carID	customerID	startDate	endDate	leaseType

```sql
--6. Find all payments made by a customer with a specific phone
number.

SELECT P.paymentID, P.leaseID, P.transactionDate, P.amount,
       C.firstName, C.lastName, C.phoneNumber
FROM Payment P
JOIN Lease L ON P.leaseID = L.leaseID
JOIN Customer C ON L.customerID = C.customerID
WHERE C.phoneNumber = '555-123-4567';
```

Results Messages

	paymentID	leaseID	transactionDate	amount	firstName	lastName	phoneNumber
1	2	2	2023-02-20	1000.00	Jane	Smith	555-123-4567

```sql
--7. Calculate the average daily rate of all available cars.

SELECT make, AVG(dailyRate) AS [Average Daily Rate]
FROM Vehicle
WHERE status = 'available'
GROUP BY make;
```

Results Messages

	make	Average Daily Rate
1	BMW	60.000000
2	Chevrolet	47.000000
3	Honda	45.000000
4	Lexus	54.000000
5	Mercedes	68.000000
6	Nissan	52.000000
7	Toyota	50.000000

```sql
--8. Find the car with the highest daily rate.

SELECT make, model, dailyRate
FROM Vehicle
WHERE dailyRate = (SELECT MAX(dailyRate) FROM Vehicle);
```

Results Messages

	make	model	dailyRate
1	Mercedes	C-Class	68.00

```sql
--9. Retrieve all cars leased by a specific customer.

SELECT V.carID, V.make, V.model
FROM Vehicle V
JOIN Lease L ON V.carID = L.carID
JOIN Customer C ON C.customerID = L.customerID
WHERE C.customerID = 5;
```

Results Messages

	carID	make	model
1	5	Chevrolet	Malibu

```sql
--10. Find the details of the most recent lease.

SELECT *
FROM Lease
WHERE startDate = (SELECT MAX(startDate) FROM Lease);
```

Results Messages

	leaseID	carID	customerID	startDate	endDate	leaseType
1	10	10	10	2023-10-10	2023-10-31	Monthly

```sql
--11. List all payments made in the year 2023.

SELECT * FROM Payment WHERE YEAR(transactionDate)=2023;
```

Results Messages

	paymentID	leaseID	transactionDate	amount
1	1	1	2023-01-03	200.00
2	2	2	2023-02-20	1000.00
3	4	4	2023-04-25	900.00
4	5	5	2023-05-07	60.00
5	7	7	2023-07-03	40.00
6	8	8	2023-08-14	1100.00
7	10	10	2023-10-25	1500.00

```sql
--12. Retrieve customers who have not made any payments.

SELECT C.*, L.leaseID, L.startDate, L.endDate, L.leaseType
FROM Customer C
JOIN Lease L ON C.customerID = L.customerID
LEFT JOIN Payment P ON L.leaseID = P.leaseID
WHERE P.leaseID IS NULL;
```

Results Messages

customerID	firstName	lastName	email	phoneNumber	leaseID	startDate	endDate	leaseType

```sql
--13. Retrieve Car Details and Their Total Payments.

SELECT V.carID, V.make, V.model, V.year, SUM(P.amount) AS [TOTAL
PAYMENTS]
FROM Vehicle V
JOIN Lease L ON V.carID = L.carID
JOIN Payment P ON L.leaseID = P.leaseID
GROUP BY V.carID, V.make, V.model, V.year;
```

Results Messages

	carID	make	model	year	TOTAL PAYMENTS
1	1	Toyota	Camry	2022	200.00
2	2	Honda	Civic	2023	1000.00
3	4	Nissan	Altima	2023	900.00
4	5	Chevrolet	Malibu	2022	60.00
5	7	BMW	3 Series	2023	40.00
6	8	Mercedes	C-Class	2022	1100.00
7	10	Lexus	ES	2023	1500.00

```sql
--14. Calculate Total Payments for Each Customer.

SELECT C.customerID, C.FirstName, C.LastName, C.Email,
SUM(P.amount) AS [TOTAL PAYMENTS]
FROM Customer C
JOIN Lease L ON C.customerID = L.customerID
JOIN Payment P ON L.leaseID = P.leaseID
GROUP BY C.customerID, C.FirstName, C.LastName, C.Email;
```

Results Messages

	customerID	FirstName	LastName	Email	TOTAL PAYMENTS
1	1	John	Doe	johndoe@example.com	200.00
2	2	Jane	Smith	janesmith@example.com	1000.00
3	4	Sarah	Brown	sarah@example.com	900.00
4	5	David	Lee	david@example.com	60.00
5	7	Michael	Davis	michael@example.com	40.00
6	8	Emma	Wilson	emma@example.com	1100.00
7	10	Olivia	Adams	olivia@example.com	1500.00

```sql
--15. List Car Details for Each Lease.

SELECT L.leaseID, L.startDate, L.endDate, L.leaseType,
       V.carID, V.make, V.model, V.year, V.dailyRate, V.status
FROM Lease L
JOIN Vehicle V ON L.carID = V.carID;
```

Results Messages

	leaseID	startDate	endDate	leaseType	carID	make	model	year	dailyRate	status
1	1	2023-01-01	2023-01-05	Daily	1	Toyota	Camry	2022	50.00	available
2	2	2023-02-15	2023-02-28	Monthly	2	Honda	Civic	2023	45.00	available
3	4	2023-04-20	2023-04-30	Monthly	4	Nissan	Altima	2023	52.00	available
4	5	2023-05-05	2023-05-10	Daily	5	Chevrolet	Malibu	2022	47.00	available
5	7	2023-07-01	2023-07-10	Daily	7	BMW	3 Series	2023	60.00	available
6	8	2023-08-12	2023-08-15	Monthly	8	Mercedes	C-Class	2022	68.00	available
7	10	2023-10-10	2023-10-31	Monthly	10	Lexus	ES	2023	54.00	available

```sql
--16. Retrieve Details of Active Leases with Customer and Car
Information.

SELECT L.leaseID, L.startDate, L.endDate, L.leaseType,
       C.customerID, C.firstName, C.lastName, C.email,
C.phoneNumber,
       V.carID, V.make, V.model, V.year, V.dailyRate, V.status
FROM Lease L
JOIN Customer C ON L.customerID = C.customerID
JOIN Vehicle V ON L.carID = V.carID
WHERE L.endDate >= GETDATE();
```

Results Messages

leaseID	startDate	endDate	leaseType	customerID	firstName	lastName	email	phoneNumber	carID	make	mode

```sql
--17. Find the Customer Who Has Spent the Most on Leases.

SELECT TOP 1 C.customerID, C.FirstName, C.LastName, C.Email,
C.phoneNumber,
       SUM(P.amount) AS [TOTAL AMOUNT SPENT]
FROM Customer C
JOIN Lease L ON C.customerID = L.customerID
JOIN Payment P ON L.leaseID = P.leaseID
GROUP BY C.customerID, C.FirstName, C.LastName, C.Email,
C.phoneNumber
ORDER BY [TOTAL AMOUNT SPENT] DESC;
```

Results Messages

	customerID	FirstName	LastName	Email	phoneNumber	TOTAL AMOUNT SPENT
1	10	Olivia	Adams	olivia@example.com	555-765-4321	1500.00

```sql
--18. List All Cars with Their Current Lease Information.

SELECT V.carID, V.make, V.model, V.year, V.dailyRate, V.status,
       L.leaseID, L.startDate, L.endDate, L.leaseType,
       C.customerID, C.firstName, C.lastName
FROM Vehicle V
LEFT JOIN Lease L ON V.carID = L.carID AND L.endDate >= GETDATE()
LEFT JOIN Customer C ON L.customerID = C.customerID
ORDER BY V.carID;
```

Results Messages

	carID	make	model	year	dailyRate	status	leaseID	startDate	endDate	leaseType	customerID	firstName	last
1	1	Toyota	Camry	2022	50.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL
2	2	Honda	Civic	2023	45.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL
3	3	Ford	Focus	2022	48.00	notAvailable	NULL	NULL	NULL	NULL	NULL	NULL	NULL
4	4	Nissan	Altima	2023	52.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL
5	5	Chevrolet	Malibu	2022	47.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL
6	6	Hyundai	Sonata	2023	49.00	notAvailable	NULL	NULL	NULL	NULL	NULL	NULL	NULL
7	7	BMW	3 Series	2023	60.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL
8	8	Mercedes	C-Class	2022	68.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL
9	9	Audi	A4	2022	55.00	notAvailable	NULL	NULL	NULL	NULL	NULL	NULL	NULL
10	10	Lexus	ES	2023	54.00	available	NULL	NULL	NULL	NULL	NULL	NULL	NULL