CODING CHALLENGE-CAR RENTAL SYSTEM

Creating Tables:

```
CREATE TABLE Vehicle (

    vehicleID INT PRIMARY KEY,
    make VARCHAR(50),
    model VARCHAR(50),
    year INT,
    dailyRate DECIMAL(10,2),
    status VARCHAR(20), -- 'available' or 'notAvailable'
    passengerCapacity INT,
    engineCapacity INT

);

CREATE TABLE Customer (

    customerID INT PRIMARY KEY,
    firstName VARCHAR(50),
    lastName VARCHAR(50),
    email VARCHAR(100),
    phoneNumber VARCHAR(20)
);

CREATE TABLE Lease (
    leaseID INT PRIMARY KEY,
    vehicleID INT FOREIGN KEY REFERENCES Vehicle(vehicleID),
    customerID INT FOREIGN KEY REFERENCES Customer(customerID),
    startDate DATE,
    endDate DATE,
    type VARCHAR(20) -- 'Daily' or 'Monthly'
);
CREATE TABLE Payment (

    paymentID INT PRIMARY KEY,
    leaseID INT FOREIGN KEY REFERENCES Lease(leaseID),
    paymentDate DATE,
    amount DECIMAL(10,2)
);
```

Inserting Data:

```
INSERT INTO Vehicle VALUES (1, 'Toyota', 'Camry', 2022, 50.00,
'available', 4, 1450), (2, 'Honda', 'Civic', 2023, 45.00,
'available', 7, 1500), (3, 'Ford', 'Focus', 2022, 48.00,
'notAvailable', 4, 1400), (4, 'Nissan', 'Altima', 2023, 52.00,
'available', 7, 1200), (5, 'Chevrolet', 'Malibu', 2022, 47.00,
'available', 4, 1800), (6, 'Hyundai', 'Sonata', 2023, 49.00,
'notAvailable', 7, 1400), (7, 'BMW', '3 Series', 2023, 60.00,
'available', 7, 2499), (8, 'Mercedes', 'C-Class', 2022, 58.00,
'available', 8, 2599), (9, 'Audi', 'A4', 2022, 55.00,
'notAvailable', 4, 2500), (10, 'Lexus', 'ES', 2023, 54.00,
'available', 4, 2500);
```

Results | Messages

	vehicleID	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	58.00	available	8	2599
9	9	Audi	A4	2022	55.00	notAvailable	4	2500
10	10	Lexus	ES	2023	54.00	available	4	2500

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

Results | Messages

	customerID	firstName	lastName	email	phoneNumber
1	1	John	Doe	johndoe@example.com	555-555-5555
2	2	Jane	Smith	janesmith@example.com	555-123-4567
3	3	Robert	Johnson	robert@example.com	555-789-1234
4	4	Sarah	Brown	sarah@example.com	555-456-7890
5	5	David	Lee	david@example.com	555-987-6543
6	6	Laura	Hall	laura@example.com	555-234-5678
7	7	Michael	Davis	michael@example.com	555-876-5432
8	8	Emma	Wilson	emma@example.com	555-432-1098
9	9	William	Taylor	william@example.com	555-321-6547
10	10	Olivia	Adams	olivia@example.com	555-765-4321

```sql
INSERT INTO Lease VALUES
(1, 1, 1, '2023-01-01', '2023-01-05', 'Daily'),
(2, 2, 2, '2023-02-15', '2023-02-28', 'Monthly'),
(3, 3, 3, '2023-03-10', '2023-03-15', 'Daily'),
(4, 4, 4, '2023-04-20', '2023-04-30', 'Monthly'),
(5, 5, 5, '2023-05-05', '2023-05-10', 'Daily'),
(6, 4, 3, '2023-06-15', '2023-06-30', 'Monthly'),
(7, 7, 7, '2023-07-01', '2023-07-10', 'Daily'),
(8, 8, 8, '2023-08-12', '2023-08-15', 'Monthly'),
(9, 3, 3, '2023-09-07', '2023-09-10', 'Daily'),
(10, 10, 10, '2023-10-10', '2023-10-31', 'Monthly');
```

Results | Messages

	leaseID	vehicleID	customerID	startDate	endDate	type
1	1	1	1	2023-01-01	2023-01-05	Daily
2	2	2	2	2023-02-15	2023-02-28	Monthly
3	3	3	3	2023-03-10	2023-03-15	Daily
4	4	4	4	2023-04-20	2023-04-30	Monthly
5	5	5	5	2023-05-05	2023-05-10	Daily
6	6	4	3	2023-06-15	2023-06-30	Monthly
7	7	7	7	2023-07-01	2023-07-10	Daily
8	8	8	8	2023-08-12	2023-08-15	Monthly
9	9	3	3	2023-09-07	2023-09-10	Daily
10	10	10	10	2023-10-10	2023-10-31	Monthly

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

Results | Messages

	paymentID	leaseID	paymentDate	amount
1	1	1	2023-01-03	200.00
2	2	2	2023-02-20	1000.00
3	3	3	2023-03-12	75.00
4	4	4	2023-04-25	900.00
5	5	5	2023-05-07	60.00
6	6	6	2023-06-18	1200.00
7	7	7	2023-07-03	40.00
8	8	8	2023-08-14	1100.00
9	9	9	2023-09-09	80.00
10	10	10	2023-10-25	1500.00

SQL Queries:

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

UPDATE Vehicle SET dailyRate = 68 WHERE make = 'Mercedes';

SELECT * FROM Vehicle;

Results | Messages

	vehicleID	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

2. Delete a specific customer and all associated leases and payments

```
DECLARE @customerID INT = 3;

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

DELETE FROM Customer WHERE customerID = @customerID;

SELECT * FROM Customer;

SELECT * FROM Lease;

SELECT * FROM Payment;
```

Results | Messages

	customerID	firstName	lastName	email	phoneNumber
1	1	John	Doe	johndoe@example.com	555-555-5555
2	2	Jane	Smith	janesmith@example.com	555-123-4567
3	4	Sarah	Brown	sarah@example.com	555-456-7890
4	5	David	Lee	david@example.com	555-987-6543
5	6	Laura	Hall	laura@example.com	555-234-5678
6	7	Michael	Davis	michael@example.com	555-876-5432
7	8	Emma	Wilson	emma@example.com	555-432-1098
8	9	William	Taylor	william@example.com	555-321-6547
9	10	Olivia	Adams	olivia@example.com	555-765-4321

	leaseID	vehicleID	customerID	startDate	endDate	type
1	1	1	1	2023-01-01	2023-01-05	Daily
2	2	2	2	2023-02-15	2023-02-28	Monthly
3	4	4	4	2023-04-20	2023-04-30	Monthly
4	5	5	5	2023-05-05	2023-05-10	Daily
5	7	7	7	2023-07-01	2023-07-10	Daily
6	8	8	8	2023-08-12	2023-08-15	Monthly
7	10	10	10	2023-10-10	2023-10-31	Monthly

	paymentID	leaseID	paymentDate	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

3.Rename the "paymentDate" column 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

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

5)Get active leases for a specific customer.

INSERT INTO Lease VALUES (11, 5, 2, '2025-03-31', '2025-04-05', 'Daily');
SELECT * FROM Lease WHERE customerID = 2 AND endDate >= GETDATE();

Results | Messages

	leaseID	vehicleID	customerID	startDate	endDate	type
1	11	5	2	2025-03-31	2025-04-05	Daily

6)Find all payments made by a customer with a specific phone number.

SELECT P.* 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
1	2	2	2023-02-20	1000.00

7)Calculate the average daily rate of all available cars.

SELECT AVG(dailyRate) AS AvgDailyRate FROM Vehicle WHERE status = 'available';

Results | Messages

	AvgDailyRate
1	53.714285

8)Find the car with the highest daily rate.

SELECT TOP 1 * FROM Vehicle ORDER BY dailyRate DESC;

Results | Messages

	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity
1	8	Mercedes	C-Class	2022	68.00	available	8	2599

9)Retrieve all cars leased by a specific customer.

SELECT V.* FROM Vehicle V
JOIN Lease L ON V.vehicleID = L.vehicleID
WHERE L.customerID = 2;

	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity
1	2	Honda	Civic	2023	45.00	available	7	1500
2	5	Chevrolet	Malibu	2022	47.00	available	4	1800

10) Find the details of the most recent lease.

SELECT TOP 1 * FROM Lease ORDER BY startDate DESC;

Results | Messages

	leaseID	vehicleID	customerID	startDate	endDate	type
1	11	5	2	2025-03-31	2025-04-05	Daily

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

12) Retrieve customers who have not made any payments.

SELECT * FROM Customer WHERE customerID NOT IN (SELECT DISTINCT customerID FROM Lease WHERE leaseID IN (SELECT leaseID FROM Payment));

Results | Messages

	customerID	firstName	lastName	email	phoneNumber
1	6	Laura	Hall	laura@example.com	555-234-5678
2	9	William	Taylor	william@example.com	555-321-6547

13)Retrieve Car Details and Their Total Payments.

SELECT V.*, ISNULL(SUM(P.amount), 0) AS TotalPayments
FROM Vehicle V
LEFT JOIN Lease L ON V.vehicleID = L.vehicleID
LEFT JOIN Payment P ON L.leaseID = P.leaseID
GROUP BY V.vehicleID, V.make, V.model, V.year, V.dailyRate, V.status, V.passengerCapacity, V.engineCapacity;

Results | Messages

	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity	TotalPayments
1	1	Toyota	Camry	2022	50.00	available	4	1450	200.00
2	2	Honda	Civic	2023	45.00	available	7	1500	1000.00
3	3	Ford	Focus	2022	48.00	notAvailable	4	1400	0.00
4	4	Nissan	Altima	2023	52.00	available	7	1200	900.00
5	5	Chevrolet	Malibu	2022	47.00	available	4	1800	60.00
6	6	Hyundai	Sonata	2023	49.00	notAvailable	7	1400	0.00
7	7	BMW	3 Series	2023	60.00	available	7	2499	40.00
8	8	Mercedes	C-Class	2022	68.00	available	8	2599	1100.00
9	9	Audi	A4	2022	55.00	notAvailable	4	2500	0.00
10	10	Lexus	ES	2023	54.00	available	4	2500	1500.00

14) Calculate Total Payments for Each Customer.

SELECT C.*, ISNULL(SUM(P.amount), 0) AS TotalPayments
FROM Customer C
LEFT JOIN Lease L ON C.customerID = L.customerID

```
LEFT JOIN Payment P ON L.leaseID = P.leaseID
GROUP BY C.customerID, C.firstName, C.lastName, C.email, C.phoneNumber;
```

Results | Messages

	customerID	firstName	lastName	email	phoneNumber	TotalPayments
1	1	John	Doe	johndoe@example.com	555-555-5555	200.00
2	2	Jane	Smith	janesmith@example.com	555-123-4567	1000.00
3	4	Sarah	Brown	sarah@example.com	555-456-7890	900.00
4	5	David	Lee	david@example.com	555-987-6543	60.00
5	6	Laura	Hall	laura@example.com	555-234-5678	0.00
6	7	Michael	Davis	michael@example.com	555-876-5432	40.00
7	8	Emma	Wilson	emma@example.com	555-432-1098	1100.00
8	9	William	Taylor	william@example.com	555-321-6547	0.00
9	10	Olivia	Adams	olivia@example.com	555-765-4321	1500.00

15) List Car Details for Each Lease.

```
SELECT L.*, C.firstName, C.lastName, V.make, V.model
FROM Lease L
JOIN Customer C ON L.customerID = C.customerID
JOIN Vehicle V ON L.vehicleID = V.vehicleID;
```

Results | Messages

	leaseID	vehicleID	customerID	startDate	endDate	type	firstName	lastName	make	model
1	1	1	1	2023-01-01	2023-01-05	Daily	John	Doe	Toyota	Camry
2	2	2	2	2023-02-15	2023-02-28	Monthly	Jane	Smith	Honda	Civic
3	4	4	4	2023-04-20	2023-04-30	Monthly	Sarah	Brown	Nissan	Altima
4	5	5	5	2023-05-05	2023-05-10	Daily	David	Lee	Chevrolet	Malibu
5	7	7	7	2023-07-01	2023-07-10	Daily	Michael	Davis	BMW	3 Series
6	8	8	8	2023-08-12	2023-08-15	Monthly	Emma	Wilson	Mercedes	C-Class
7	10	10	10	2023-10-10	2023-10-31	Monthly	Olivia	Adams	Lexus	ES
8	11	5	2	2025-03-31	2025-04-05	Daily	Jane	Smith	Chevrolet	Malibu

16)Retrieve Details of Active Leases with Customer and Car Information.

```
SELECT V.*, L.startDate, L.endDate, C.firstName, C.lastName

FROM Vehicle V

JOIN Lease L ON V.vehicleID = L.vehicleID

JOIN Customer C ON L.customerID = C.customerID
WHERE L.endDate >= GETDATE();
```

Results | Messages

	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity	startDate	endDate	firstName	lastName
1	5	Chevrolet	Malibu	2022	47.00	available	4	1800	2025-03-31	2025-04-05	Jane	Smith

17)Find the Customer Who Has Spent the Most on Leases.

```
SELECT TOP 1 C.*, SUM(P.amount) AS TotalSpent
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 TotalSpent DESC;
```

Results | Messages

	customerID	firstName	lastName	email	phoneNumber	TotalSpent
1	10	Olivia	Adams	olivia@example.com	555-765-4321	1500.00

18)List All Cars with Their Current Lease Information.

```
SELECT V.*, L.leaseID, L.startDate, L.endDate, L.type
FROM Vehicle V
LEFT JOIN Lease L ON V.vehicleID = L.vehicleID AND L.endDate >= GETDATE();
```

Results | Messages

	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity	leaseID	startDate	endDate	type
1	1	Toyota	Camry	2022	50.00	available	4	1450	NULL	NULL	NULL	NULL
2	2	Honda	Civic	2023	45.00	available	7	1500	NULL	NULL	NULL	NULL
3	3	Ford	Focus	2022	48.00	notAvailable	4	1400	NULL	NULL	NULL	NULL
4	4	Nissan	Altima	2023	52.00	available	7	1200	NULL	NULL	NULL	NULL
5	5	Chevrolet	Malibu	2022	47.00	available	4	1800	11	2025-03-31	2025-04-05	Daily
6	6	Hyundai	Sonata	2023	49.00	notAvailable	7	1400	NULL	NULL	NULL	NULL
7	7	BMW	3 Series	2023	60.00	available	7	2499	NULL	NULL	NULL	NULL
8	8	Mercedes	C-Class	2022	68.00	available	8	2599	NULL	NULL	NULL	NULL
9	9	Audi	A4	2022	55.00	notAvailable	4	2500	NULL	NULL	NULL	NULL
10	10	Lexus	ES	2023	54.00	available	4	2500	NULL	NULL	NULL	NULL