CODING CHALLENGE

Car Rental System

NAME: PRINCE PATEL

CODING CHALLENGE: Car Rental System

```
CREATE DATABASE CarRentalSystem;
USE CarRentalSystem;

/*Vehicle Table:
• vehicleID (Primary Key)
• make
• model
• year
• dailyRate
• status (available, notAvailable)
• passengerCapacity
• engineCapacity */

CREATE TABLE Vehicle (
    vehicleID INT PRIMARY KEY,
    make VARCHAR(45),
    model VARCHAR(45),
    year INT,
    dailyRate DECIMAL(10, 2),
    status INT,
```

```
    passengerCapacity INT,
    engineCapacity INT
);

/*Customer Table:
• customerID (Primary Key)
• firstName
• lastName
• email
• phoneNumber */

CREATE TABLE Customer (
    customerID INT PRIMARY KEY,
    firstName VARCHAR(45),
    lastName VARCHAR(55),
    email VARCHAR(120),
    phoneNumber VARCHAR(20)
);

/*Lease Table:
• leaseID (Primary Key)
• vehicleID (Foreign Key referencing Vehicle Table)
• customerID (Foreign Key referencing Customer Table)
• startDate
• endDate
• type (to distinguish between DailyLease and MonthlyLease) */

CREATE TABLE Lease (
    leaseID INT PRIMARY KEY,
```

```
    vehicleID INT,
    customerID INT,
    startDate DATE,
    endDate DATE,
    type VARCHAR(15),
    CONSTRAINT FK_Lease_Vehicle FOREIGN KEY (vehicleID) REFERENCES Vehicle(vehicleID),
    CONSTRAINT FK_Lease_Customer FOREIGN KEY (customerID) REFERENCES Customer(customerID)
);

/*Payment Table:
• paymentID (Primary Key)
• leaseID (Foreign Key referencing Lease Table)
• paymentDate
• amount */

CREATE TABLE Payment (
    paymentID INT PRIMARY KEY,
    leaseID INT,
    paymentDate DATE,
    amount DECIMAL(10, 2),
    CONSTRAINT FK_Payment_Lease FOREIGN KEY (leaseID) REFERENCES Lease(leaseID)
);

INSERT INTO Vehicle (vehicleID, make, model, year, dailyRate, status, passengerCapacity, engineCapacity)
VALUES
(1, 'Toyota', 'Camry', 2022, 50.00, 1, 4, 1450),
(2, 'Honda', 'Civic', 2023, 45.00, 1, 7, 1500),
(3, 'Ford', 'Focus', 2022, 48.00, 0, 4, 1400),
(4, 'Nissan', 'Altima', 2023, 52.00, 1, 7, 1200),
```

(5, 'Chevrolet', 'Malibu', 2022, 47.00, 1, 4, 1800),

(6, 'Hyundai', 'Sonata', 2023, 49.00, 0, 7, 1400),

(7, 'BMW', '3 Series', 2023, 60.00, 1, 7, 2499),

(8, 'Mercedes', 'C-Class', 2022, 58.00, 1, 8, 2599),

(9, 'Audi', 'A4', 2022, 55.00, 0, 4, 2500),

(10, 'Lexus', 'ES', 2023, 54.00, 1, 4, 2500);

INSERT INTO Customer (customerID, firstName, lastName, email, phoneNumber)

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');

INSERT INTO Lease (leaseID, vehicleID, customerID, startDate, endDate, type)

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'),

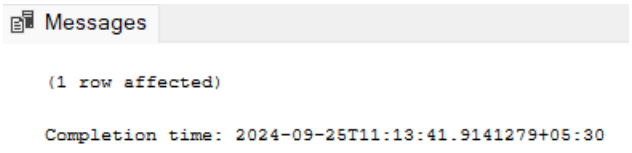
(4, 4, 4, '2023-04-20', '2023-04-30', 'Monthly'),

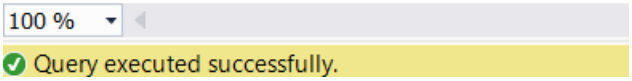
(5, 5, 5, '2023-05-05', '2023-05-10', 'Daily'),

(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');

INSERT INTO Payment (paymentID, leaseID, paymentDate, amount)
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);


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

UPDATE Vehicle
SET dailyRate = 68.00
WHERE make = 'Mercedes';
```



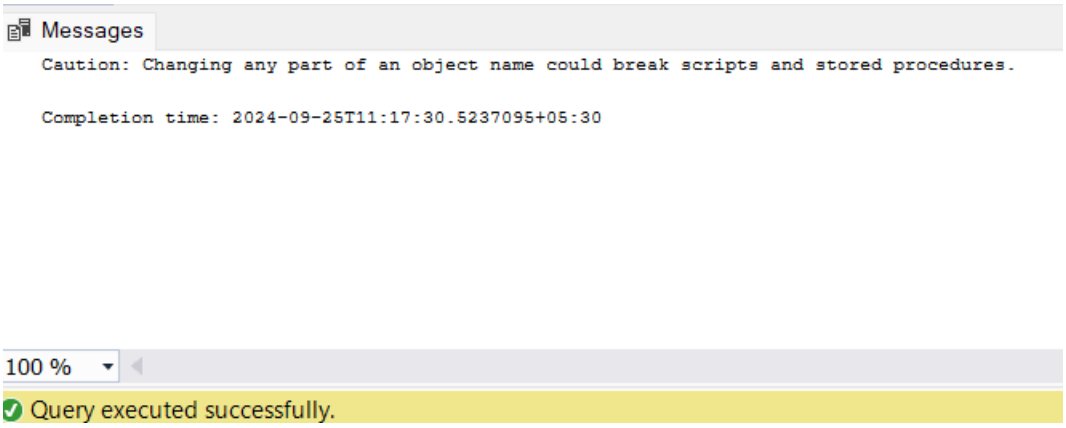


--2. Delete a specific customer and all associated leases and payments.

```
DECLARE @customerID INT = 1; -- We can replace 1 with any desired customerID

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;
```

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

EXEC sp_rename 'Payment.paymentDate', 'transactionDate', 'COLUMN';

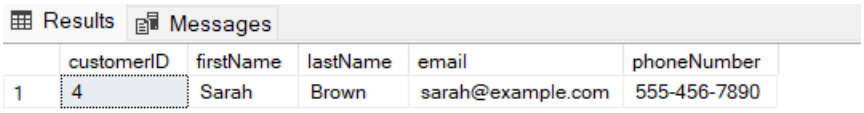


--4. Find a specific customer by email.

SELECT *

FROM Customer

WHERE email = 'sarah@example.com'; -- We can replace this with the email of any specific customer



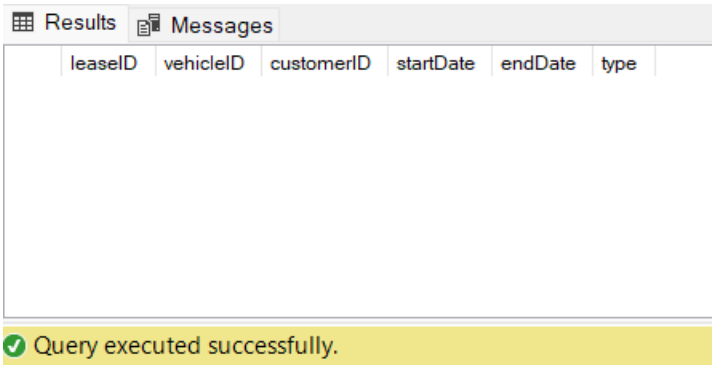
Results Messages

	customerID	firstName	lastName	email	phoneNumber
1	4	Sarah	Brown	sarah@example.com	555-456-7890

Query executed successfully.

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

```
SELECT *
FROM Lease
WHERE customerID = 2 AND endDate >= GETDATE(); -- We can replace 2 with any desired customerID
```



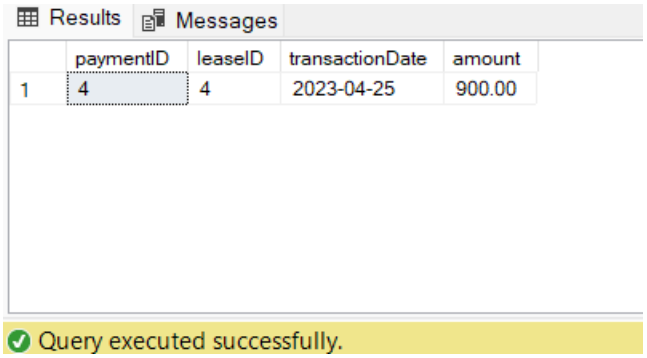
Results Messages

leaseID	vehicleID	customerID	startDate	endDate	type

Query executed successfully.

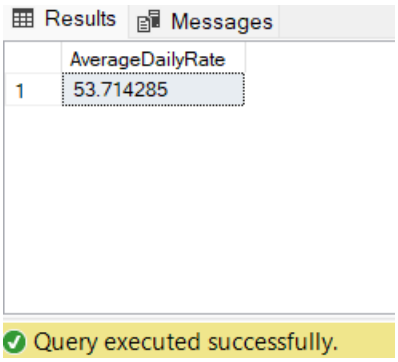
--6. Find all payments made by a customer with a specific phone number.

```
SELECT P.*
FROM Payment P
JOIN Lease L ON P.leaseID = L.leaseID
JOIN Customer C ON L.customerID = C.customerID
WHERE C.phoneNumber = '555-456-7890'; /* We can replace this with the phone number of any specific customer */
```



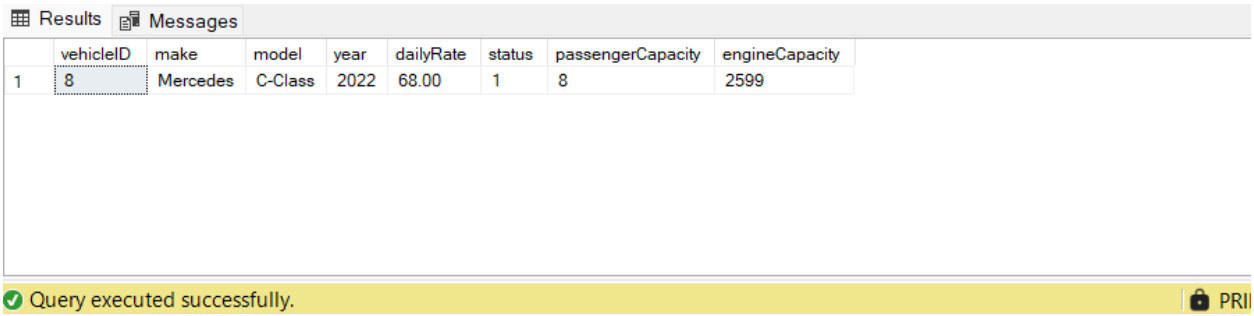
--7. Calculate the average daily rate of all available cars.

```
SELECT AVG(dailyRate) AS AverageDailyRate
FROM Vehicle
WHERE status = 1;
```



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

```
SELECT TOP 1 *
FROM Vehicle
ORDER BY dailyRate DESC;
```



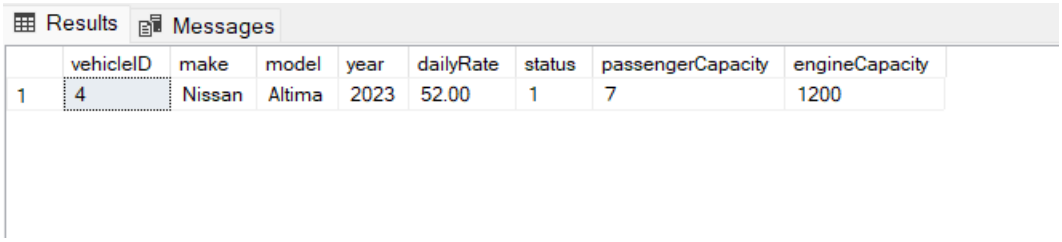
Results Messages

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

Query executed successfully.

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

```
SELECT V.*
FROM Lease L
JOIN Vehicle V ON L.vehicleID = V.vehicleID
WHERE L.customerID = 4; -- We can replace this with any desired customerID
```



Results Messages

	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity
1	4	Nissan	Altima	2023	52.00	1	7	1200

--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	10	10	10	2023-10-10	2023-10-31	Monthly

Query executed successfully.

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

```
SELECT *
FROM Payment
WHERE YEAR(transactionDate) = 2023; /* In question number 3 we renamed the "paymentDate" column in the Payment table to "transactionDate" */
```

Results Messages

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

Query executed successfully.

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

```
SELECT C.*
FROM Customer C
WHERE C.customerID NOT IN (
    SELECT L.customerID
```

```
    FROM Lease L
    JOIN Payment P ON L.leaseID = P.leaseID
);
```

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.vehicleID, V.make, V.model, SUM(P.amount) AS TotalPayments
FROM Vehicle V
JOIN Lease L ON V.vehicleID = L.vehicleID
JOIN Payment P ON L.leaseID = P.leaseID
GROUP BY V.vehicleID, V.make, V.model;
```

Results Messages

	vehicleID	make	model	TotalPayments
1	2	Honda	Civic	1000.00
2	3	Ford	Focus	155.00
3	4	Nissan	Altima	2100.00
4	5	Chevrolet	Malibu	60.00
5	7	BMW	3 Series	40.00
6	8	Mercedes	C-Class	1100.00
7	10	Lexus	ES	1500.00

Query executed successfully.

--14. Calculate Total Payments for Each Customer.

```
SELECT C.customerID, C.firstName, C.lastName, SUM(P.amount) AS TotalPayments
```

```
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;
```

Results | Messages

	customerID	firstName	lastName	TotalPayments
1	2	Jane	Smith	1000.00
2	3	Robert	Johnson	1355.00
3	4	Sarah	Brown	900.00
4	5	David	Lee	60.00
5	7	Michael	Davis	40.00
6	8	Emma	Wilson	1100.00
7	10	Olivia	Adams	1500.00

--15. List Car Details for Each Lease.

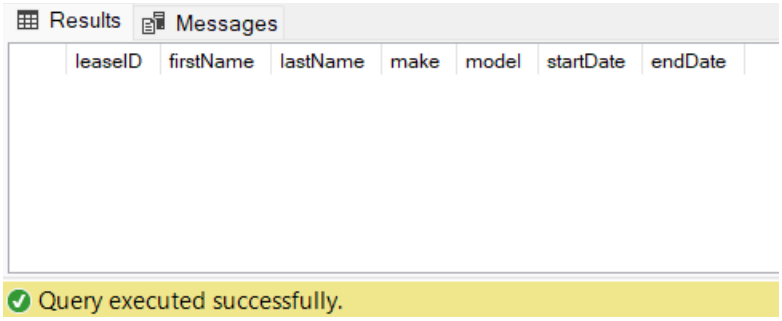
```
SELECT L.leaseID, V.make, V.model, L.startDate, L.endDate
FROM Lease L
JOIN Vehicle V ON L.vehicleID = V.vehicleID;
```

Results | Messages

	leaseID	make	model	startDate	endDate
1	2	Honda	Civic	2023-02-15	2023-02-28
2	3	Ford	Focus	2023-03-10	2023-03-15
3	4	Nissan	Altima	2023-04-20	2023-04-30
4	5	Chevrolet	Malibu	2023-05-05	2023-05-10
5	6	Nissan	Altima	2023-06-15	2023-06-30
6	7	BMW	3 Series	2023-07-01	2023-07-10
7	8	Mercedes	C-Class	2023-08-12	2023-08-15
8	9	Ford	Focus	2023-09-07	2023-09-10
9	10	Lexus	ES	2023-10-10	2023-10-31

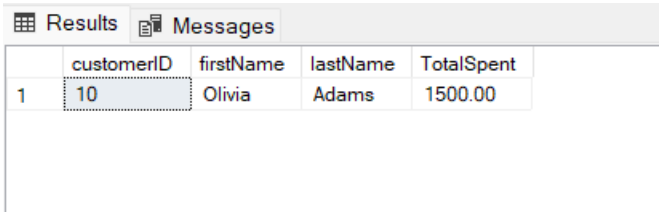
--16. Retrieve Details of Active Leases with Customer and Car Information.

```
SELECT L.leaseID, C.firstName, C.lastName, V.make, V.model, L.startDate, L.endDate
FROM Lease L
JOIN Customer C ON L.customerID = C.customerID
JOIN Vehicle V ON L.vehicleID = V.vehicleID
WHERE L.endDate >= GETDATE();
```



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

```
SELECT TOP 1 C.customerID, C.firstName, C.lastName, 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
ORDER BY TotalSpent DESC;
```



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

```
SELECT
    V.vehicleID, V.make, V.model, V.year, V.dailyRate, V.status AS availability, L.leaseID, L.customerID,
L.startDate, L.endDate, L.type AS leaseType
FROM Vehicle V
LEFT JOIN Lease L ON V.vehicleID = L.vehicleID
ORDER BY V.vehicleID;
```

Results Messages

	vehicleID	make	model	year	dailyRate	availability	leaseID	customerID	startDate	endDate	leaseType
1	1	Toyota	Camry	2022	50.00	1	NULL	NULL	NULL	NULL	NULL
2	2	Honda	Civic	2023	45.00	1	2	2	2023-02-15	2023-02-28	Monthly
3	3	Ford	Focus	2022	48.00	0	3	3	2023-03-10	2023-03-15	Daily
4	3	Ford	Focus	2022	48.00	0	9	3	2023-09-07	2023-09-10	Daily
5	4	Nissan	Altima	2023	52.00	1	4	4	2023-04-20	2023-04-30	Monthly
6	4	Nissan	Altima	2023	52.00	1	6	3	2023-06-15	2023-06-30	Monthly
7	5	Chevrolet	Malibu	2022	47.00	1	5	5	2023-05-05	2023-05-10	Daily
8	6	Hyundai	Sonata	2023	49.00	0	NULL	NULL	NULL	NULL	NULL
9	7	BMW	3 Series	2023	60.00	1	7	7	2023-07-01	2023-07-10	Daily
10	8	Mercedes	C-Class	2022	68.00	1	8	8	2023-08-12	2023-08-15	Monthly
11	9	Audi	A4	2022	55.00	0	NULL	NULL	NULL	NULL	NULL
12	10	Lexus	ES	2023	54.00	1	10	10	2023-10-10	2023-10-31	Monthly