CODING CHALLENGE

NAME: Aniroop Gupta

CODING CHALLENGE: Car Rental System

Create Database Car_Rental_System;

Use Car_Rental_System;

--Creating Tables

Create Table Vehicle(

vehicleID INT PRIMARY KEY,

make VARCHAR(255),

model VARCHAR(255),

year INT,

dailyRate Decimal(10, 2),

status VARCHAR(20) CHECK (status IN ('available', 'notAvailable')),

passengerCapacity INT,

engineCapacity INT);

Create Table Customer (

customerID INT PRIMARY KEY,

firstName VARCHAR(255),

lastName VARCHAR(255),

email VARCHAR(255),

phoneNumber VARCHAR(20));

Create Table Lease(

leaseID INT PRIMARY KEY,

vehicleID INT FOREIGN KEY REFERENCES Vehicle(vehicleID),

```sql
customerID INT,

FOREIGN KEY(customerID) REFERENCES Customer(customerID),

startDate Date,

endDate Date,

type VARCHAR(20) CHECK (type IN ('DailyLease', 'MonthlyLease')));


Create Table Payment(

paymentID INT PRIMARY KEY,

leaseID INT,

FOREIGN KEY(leaseID) REFERENCES Lease(leaseID),

paymentDate DATE,

amount DECIMAL(10, 2));
```

--Inserting Data into Tables

```sql
INSERT INTO Vehicle (vehicleID, make, model, year, dailyRate, status, passengerCapacity, engineCapacity) 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);

Select * from Vehicle;
```

	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

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');

Select * from Customer;

	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

Insert into Lease (leaseID,vehicleID,customerID,startDate,endDate,type) Values

(1, 1, 1, '2023-01-01', '2023-01-05','DailyLease'),

(2, 2, 2, '2023-02-15', '2023-02-28','MonthlyLease'),

(3, 3, 3, '2023-03-10', '2023-03-15','DailyLease'),

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

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

(6, 4, 3, '2023-06-15', '2023-06-30','MonthlyLease'),

(7, 7, 7, '2023-07-01', '2023-07-10','DailyLease'),

(8, 8, 8, '2023-08-12', '2023-08-15','MonthlyLease'),

(9, 3, 3, '2023-09-07', '2023-09-10','DailyLease'),

(10, 10, 10, '2023-10-10', '2023-10-31','MonthlyLease');

Select * from Lease;

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

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);

Select * from Payment;

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

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

Update Vehicle SET dailyRate = 68 where make = 'Mercedes';

Select * from Vehicle;

Results | **Messages**

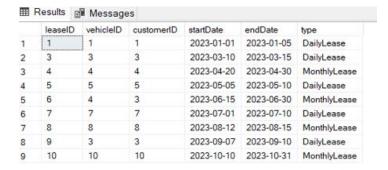|	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity
1	1	Toyota	Camry	2022	50.00	available	4	1450
2	2	Honda	Civic	2023	45.00	available	7	1500
3	3	Ford	Focus	2022	48.00	notAvailable	4	1400
4	4	Nissan	Altima	2023	52.00	available	7	1200
5	5	Chevrolet	Malibu	2022	47.00	available	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.

Delete from Payment where leaseID = (Select leaseID from Lease where customerID = 2);

Select * from Payment;

Results | **Messages**

	paymentID	leaseID	paymentDate	amount
1	1	1	2023-01-03	200.00
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

Delete from Lease where customerID = 2;

Select * from Lease;

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

Delete from Customer where customerID = 2;

Select * from Customer;

	customerID	firstName	lastName	email	phoneNumber
1	1	John	Doe	johndoe@example.com	555-555-5555
2	3	Robert	Johnson	robert@example.com	555-789-1234
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

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

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

Select * from Payment;

	paymentID	leaseID	transactionDate	amount
1	1	1	2023-01-03	200.00
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

--4. Find a specific customer by email.

Select * from Customer where email='olivia@example.com'

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

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

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

	leaseID	vehicleID	customerID	startDate	endDate	type

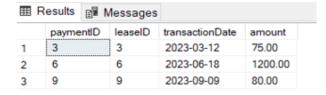## --6. Find all payments made by a customer with a specific phone number.

SELECT P.paymentID, P.leaseID, P.transactionDate, P.amount

FROM Payment P

JOIN Lease L ON P.leaseID = L.leaseID

JOIN Customer C ON L.customerID = C.customerID

WHERE C.phoneNumber = '555-789-1234';

	paymentID	leaseID	transactionDate	amount
1	3	3	2023-03-12	75.00
2	6	6	2023-06-18	1200.00
3	9	9	2023-09-09	80.00

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

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

	avgDailyRate
1	53.714285

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

SELECT TOP 1 * FROM Vehicle ORDER BY dailyRate DESC;

	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
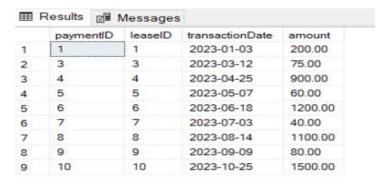
ON V.vehicleID = L.vehicleID where L.customerID = 4;

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

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

Select Top 1 * From Lease Order by endDate DESC;

	leaseID	vehicleID	customerID	startDate	endDate	type
1	10	10	10	2023-10-10	2023-10-31	MonthlyLease

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

Select * from Payment where transactionDate like '2023%';

	paymentID	leaseID	transactionDate	amount
1	1	1	2023-01-03	200.00
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

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

SELECT c.* FROM customer c JOIN lease l

ON l.customerID = c.customerID

WHERE leaseID NOT IN (SELECT leaseID from payment);

--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	1	Toyota	Camry	200.00
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

--14. Calculate Total Payments for Each Customer.

Select C.customerID, C.firstName, C.lastName, SUM(P.amount) AS totalPayment

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	totalPayment
1	1	John	Doe	200.00
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.*, V.* FROM Lease L JOIN Vehicle V

ON L.vehicleID = V.vehicleID;

Results Messages

	leaseID	vehicleID	customerID	startDate	endDate	type	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity
1	1	1	1	2023-01-01	2023-01-05	DailyLease	1	Toyota	Camry	2022	50.00	available	4	1450
2	3	3	3	2023-03-10	2023-03-15	DailyLease	3	Ford	Focus	2022	48.00	notAvailable	4	1400
3	4	4	4	2023-04-20	2023-04-30	MonthlyLease	4	Nissan	Altima	2023	52.00	available	7	1200
4	5	5	5	2023-05-05	2023-05-10	DailyLease	5	Chevrolet	Malibu	2022	47.00	available	4	1800
5	6	4	3	2023-06-15	2023-06-30	MonthlyLease	4	Nissan	Altima	2023	52.00	available	7	1200
6	7	7	7	2023-07-01	2023-07-10	DailyLease	7	BMW	3 Series	2023	60.00	available	7	2499
7	8	8	8	2023-08-12	2023-08-15	MonthlyLease	8	Mercedes	C-Class	2022	68.00	available	8	2599
8	9	3	3	2023-09-07	2023-09-10	DailyLease	3	Ford	Focus	2022	48.00	notAvailable	4	1400
9	10	10	10	2023-10-10	2023-10-31	MonthlyLease	10	Lexus	ES	2023	54.00	available	4	2500

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

SELECT L.*, C.*, V.* FROM Lease L

JOIN Customer C ON L.customerID = C.customerID

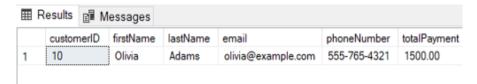JOIN Vehicle V ON L.vehicleID = V.vehicleID

WHERE L.endDate >= GETDATE();

Results Messages

leaseID	vehicleID	customerID	startDate	endDate	type	customerID	firstName	lastName	email	phoneNumber	vehicleID	make	model	year	dailyRate	status	passengerCapacity	engineCapacity

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

Select TOP 1 C.*, SUM(P.amount) AS totalPayment

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 SUM(P.amount) DESC;

Results Messages

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

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

Select V.make, V.model, L.startDate, L.endDate, L.type

from Vehicle V JOIN Lease L ON

L.vehicleID = V.vehicleID;

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