Coding Challenge

Name – Rohan Mahajan

Coding Challenge - Car Rental System – SQL

SQL Schema:

1. Vehicle Table:

- **vehicleID (Primary Key)**
- **make**
- **model**
- **year**
- **dailyRate**
- **status (available, notAvailable)**
- **passengerCapacity**
- **engineCapacity**

2. Customer Table:

- **customerID (Primary Key)**
- **firstName**
- **lastName**
- **email**
- **phoneNumber**

3. 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)**

4. Payment Table:

- **paymentID (Primary Key)**
- **leaseID (Foreign Key referencing Lease Table)**
- **paymentDate**
- **amount**

```
create table vehicle(
    vehicle_id int primary key,
        maker varchar(20) not null,
        model varchar(20) not null,
        year int,
        daily_rate decimal(10, 2) not null constraint chk_dr check (daily_rate>0),
        status varchar(20) constraint chk_status check (status in ('available', 'notAvailable')),
        passenger_capacity int constraint chk_capa check (passenger_capacity >0),
        engine_capacity int constraint chk_encapa check (engine_capacity >0)
);

create table customer(
    customer_id int primary key,
        first_name varchar(20) not null,
        last_name varchar(20) not null,
        email varchar(30) unique not null,
        phone_number varchar(20) not null
);

create table lease(
    lease_id int primary key,
        vehicle_id int not null,
        customer_id int not null,
        start_date date not null,
        end_date date not null,
        type varchar(20) constraint chk_type check(type in ('DailyLease', 'MonthlyLease')),
        constraint fk_lease_vehicle foreign key (vehicle_id)
        references vehicle(vehicle_id)
        on delete cascade
        on update cascade,
        constraint fk_lease_customer foreign key (customer_id)
```

```
        references customer(customer_id)
        on delete cascade
        on update cascade,
);

create table payment(
    payment_id int primary key,
        lease_id int not null,
        payment_date date not null,
        amount decimal(10, 2) not null check(amount>0),
        constraint fk_payment_lease foreign key(lease_id)
        references lease(lease_id)
        on delete cascade
        on update cascade
);
```

Questions :-

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

Query=>

```
update vehicle
set daily_rate = 68
where maker = 'Mercede';

select * from vehicle;
```

Result=>

	car_id	maker	model	m_year	daily_rate	status	passenger_capcity	engine_capacity
1	1	Toyota	Camry	2022	50	1	4	1450
2	2	Honda	Civic	2023	45	1	7	1500
3	3	Ford	Focus	2022	48	0	4	1400
4	4	Nissan	Altima	2023	52	1	7	1200
5	5	Chevrolet	Malibu	2022	47	1	4	1800
6	6	Hyundai	Sonata	2023	49	0	7	1400
7	7	BMW	3 Series	2023	60	1	7	2499
8	8	Mercedes	C-Class	2022	68	1	8	2599
9	9	Audi	A4	2022	55	0	4	2500
10	10	Lexus	ES	2023	54	1	4	2500

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

Query=>

```
delete from customer
where customer_id = 5;

select * from customer;
```

Result=>

Customer table

	customer_id	first_name	last_name	email	phone_number
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	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

Lease table

	lease_id	vehicle_id	customer_id	start_date	end_date	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	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
10	11	9	6	2024-09-11	2024-09-15	DailyLease
11	12	6	9	2024-09-20	2024-09-25	DailyLease

Payment table

	payment_id	lease_id	transaction_date	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	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
10	11	11	2024-09-13	275.00
11	12	12	2024-09-22	225.00

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

Query=>

```
exec sp_rename 'payment.payment_date', 'transaction_date', 'column';
select * from payment;
```

Result=>

	payment_id	lease_id	transaction_date	amout
1	1	1	2023-01-03	16400
2	2	2	2023-02-20	82000
3	3	3	2023-03-12	6150
4	4	4	2023-04-25	73800
5	5	5	2023-05-07	4920
6	6	6	2023-06-18	98400
7	7	7	2023-07-03	3280
8	8	8	2023-08-14	90200
9	9	9	2023-09-09	6560
10	10	10	2023-10-25	123000

4. Find a specific customer by email.

Query=>

```
select * from customer
where email = 'robert@example.com';
```

Result=>

	customer_id	f_name	l_name	email	phone
1	3	Robert	Johnson	robert@example.com	555-789-1234

5. Get active leases for a specific customer.

Query=>

```
select * from lease
where customer_id = 6 and end_date>=getdate();
```

Result=>

lease_id	vehicle_id	customer_id	start_date	end_date	type

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

Query=>

```
select concat(c.first_name,' '+c.last_name) as customer_name, c.phone_number, p.transaction_date
from lease l
join customer c on l.customer_id = c.customer_id
join payment p on l.lease_id = p.lease_id
where c.phone_number = '555-555-5555'
group by concat(c.first_name,' '+c.last_name), c.phone_number, p.transaction_date;
```

Result=>

	customer_name	phone_number	transaction_date
1	John Doe	555-555-5555	2023-01-03

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

Query=>

```
select avg(daily_rate) as avg_rate from vehicle;
```

Result=>

	avg_rate
1	51.800000

8. Find the car with the highest daily rate.

Query=>

```
select * from vehicle
where daily_rate = (select max(daily_rate) from vehicle);
```

Result=>

	car_id	maker	model	m_year	daily_rate	status	passenger_capcity	engine_capacity
1	8	Mercedes	C-Class	2022	68	1	8	2599

9. Retrieve all cars leased by a specific customer.

Query=>

```
select v.vehicle_id, v.maker, v.model, c.first_name
from lease l
inner join vehicle v on l.vehicle_id = v.vehicle_id
inner join customer c on l.customer_id = c.customer_id
where c.first_name = 'Robert'
group by v.maker, v.model, v.vehicle_id, c.first_name;
```

Result=>

	vehicle_id	maker	model	first_name
1	3	Ford	Focus	Robert
2	4	Nissan	Altima	Robert

10. Find the details of the most recent lease.

Query=>

```
select * from lease
order by start_date
offset (select count(*) from lease)-1 rows;
```

Result=>

	lease_id	vehicle_id	customer_id	start_date	end_date	type
1	10	10	10	2023-10-10	2023-10-31	MonthlyLease

11. List all payments made in the year 2023.

Query=>

```
select * from payment
where year(transaction_date) = 2023;
```

Result=>

	payment_id	lease_id	transaction_date	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

12. Retrieve customers who have not made any payments.

Query=>

```
select c.customer_id, concat(c.first_name, ' '+c.last_name) as customer_name
from customer c
where not exists(
     select 1 from lease l
     join payment p on l.lease_id = p.lease_id
     where l.customer_id = c.customer_id
);
```

Result=>

	customer_id	customer_name
1	6	Laura Hall
2	9	William Taylor

13. Retrieve Car Details and Their Total Payments.

Query=>

```
select v.vehicle_id, v.maker, v.model, sum(p.amount) as total_payments
from lease l
join vehicle v on l.vehicle_id = v.vehicle_id
join payment p on l.lease_id = p.lease_id
group by v.vehicle_id, v.maker, v.model;
```

Result=>

	vehicle_id	maker	model	total_payments
1	1	Toyota	Camry	200.00
2	2	Honda	Civic	1000.00
3	3	Ford	Focus	155.00
4	4	Nissan	Altima	2100.00
5	5	Chevrolet	Malibu	60.00
6	7	BMW	3 Series	40.00
7	8	Mercedes	C-Class	1100.00
8	10	Lexus	ES	1500.00

14. Calculate Total Payments for Each Customer.

Query=>

```
select concat(c.first_name, ' '+c.last_name) as customer_name, sum(p.amount) as total_amount
from lease l
join customer c on l.customer_id = c.customer_id
join payment p on l.lease_id = p.lease_id
group by concat(c.first_name, ' '+c.last_name);
```

Result=>

	customer_name	total_amount
1	David Lee	60.00
2	Emma Wilson	1100.00
3	Jane Smith	1000.00
4	John Doe	200.00
5	Michael Davis	40.00
6	Olivia Adams	1500.00
7	Robert Johnson	1355.00
8	Sarah Brown	900.00

15. List Car Details for Each Lease.

Query=>

```
select l.lease_id, v.vehicle_id, v.maker, v.model, l.type
from vehicle v
join lease l on v.vehicle_id = l.vehicle_id;
```

Result=>

	lease_id	vehicle_id	maker	model	type
1	1	1	Toyota	Camry	DailyLease
2	2	2	Honda	Civic	MonthlyLease
3	3	3	Ford	Focus	DailyLease
4	4	4	Nissan	Altima	MonthlyLease
5	5	5	Chevrolet	Malibu	DailyLease
6	6	4	Nissan	Altima	MonthlyLease
7	7	7	BMW	3 Series	DailyLease
8	8	8	Mercedes	C-Class	MonthlyLease
9	9	3	Ford	Focus	DailyLease
10	10	10	Lexus	ES	MonthlyLease

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

Query=>

```
select v.vehicle_id, c.customer_id, l.lease_id
from lease l
join customer c on l.customer_id = c.customer_id
join vehicle v on l.vehicle_id = v.vehicle_id
where l.end_date> getdate();
```

Result=>

	vehicle_id	customer_id	lease_id
1	6	9	12

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

Query=>

```
select top 1
     l.customer_id,
     concat(c.first_name, ' '+c.last_name) as customer_name,
     sum(p.amount) as pay_amounts
from lease l
join payment p on l.lease_id = p.lease_id
join customer c on l.customer_id = c.customer_id
group by l.customer_id, concat(c.first_name, ' '+c.last_name)
order by pay_amounts desc;
```

Result=>

	customer_id	customer_name	pay_amounts
1	10	Olivia Adams	1500.00

18. List All Cars with Their Current Lease Information.

Query=>

```
select v.vehicle_id, v.maker, v.model, l.type
from vehicle v
join lease l on v.vehicle_id = l.vehicle_id
order by v.vehicle_id;
```

Result=>

	vehicle_id	maker	model	type
1	1	Toyota	Camry	DailyLease
2	2	Honda	Civic	MonthlyLease
3	3	Ford	Focus	DailyLease
4	3	Ford	Focus	DailyLease
5	4	Nissan	Altima	MonthlyLease
6	4	Nissan	Altima	MonthlyLease
7	5	Chevrolet	Malibu	DailyLease
8	6	Hyundai	Sonata	DailyLease
9	7	BMW	3 Series	DailyLease
10	8	Mercedes	C-Class	MonthlyLease
11	9	Audi	A4	DailyLease
12	10	Lexus	ES	MonthlyLease