Coding Challenge - Car Rental System

```sql
create database CRS;
use crs;

create table vehicle(
    vehicleid int primary key,
    make varchar(255),
    model varchar(255),
    year year,
    dailyrate decimal,
    statue enum("available", "notavailable"),
    passengercapacity int,
    enginecapacity int
    );

create table Customer(
    CustomerID INT,
    FirstName VARCHAR(45),
    LastName VARCHAR(45),
    Email VARCHAR(45),
    Phone VARCHAR(25),
    PRIMARY KEY (CustomerID));

create table lease(
    leaseid int primary key,
    vehicleid int,
    customerid int,
    startdate date,
    enddate date,
    type enum("daily","monthly"));

create table payment(
    paymentid int primary key,
    leaseid int,
    paymentdate date,
    amount decimal);


alter table lease add foreign key(vehicleid) references vehicle(vehicleid);
alter table lease add foreign key(customerid) references Customer(CustomerID);
alter table payment add foreign key(leaseid) references lease(leaseid);
```

```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@examp', '555-765-4321');


INSERT INTO vehicle VALUES
    ('1', 'toyata', 'camry', 2022, '50', 'notavailable', '4', '1450'),
    ('2', 'honda', 'civic', 2023, '45', 'notavailable', '7', '1500'),
    ('3', 'ford', 'focus', 2022, '48', 'available', '4', '1400'),
    ('4', 'nissan', 'altima', 2023, '52', 'notavailable', '7', '1200'),
    ('5', 'cheverlot', 'mailbu', 2022, '47', 'notavailable', '4', '1800'),
    ('6', 'hyundai', 'sanata', 2023, '49', 'available', '7', '1400'),
    ('7', 'bmw', '3 serier', 2023, '60', 'notavailable', '7', '2499'),
    ('8', 'mercedes', 'c class', 2022, '58', 'notavailable', '8', '2599'),
    ('9', 'audi', 'a4', 2022, '55', 'available', '4', '2500'),
    ('10', 'lexus', 'es', 2023, '54', 'notavailable', '4', '2500');
```

```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');


INSERT INTO payment VALUES
    ('1', '1', '2023-01-03', '200'),
    ('2', '2', '2023-02-20', '1000'),
    ('3', '3', '2023-03-12', '75'),
    ('4', '4', '2023-04-25', '900'),
    ('5', '5', '2023-05-07', '60'),
    ('6', '6', '2023-06-18', '1200'),
    ('7', '7', '2023-07-03', '40'),
    ('8', '8', '2023-08-14', '1100'),
    ('9', '9', '2023-09-09', '80'),
    ('10', '10', '2023-10-25', '1500');
```

CustomerID	FirstName	LastName	Email	Phone
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@examp	555-765-4321

vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity
1	toyata	camry	2022	50	notavailable	4	1450
2	honda	civic	2023	45	notavailable	7	1500
3	ford	focus	2022	48	available	4	1400
4	nissan	altima	2023	52	notavailable	7	1200
5	cheverlot	mailbu	2022	47	notavailable	4	1800
6	hyundai	sanata	2023	49	available	7	1400
7	bmw	3 serier	2023	60	notavailable	7	2499
8	mercedes	c class	2022	58	notavailable	8	2599
9	audi	a4	2022	55	available	4	2500
10	lexus	es	2023	54	notavailable	4	2500

leaseid	vehicleid	customerid	startdate	enddate	type
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

paymentid	leaseid	paymentdate	amount
1	1	2023-01-03	200
2	2	2023-02-20	1000
3	3	2023-03-12	75
4	4	2023-04-25	900
5	5	2023-05-07	60
6	6	2023-06-18	1200
7	7	2023-07-03	40
8	8	2023-08-14	1100
9	9	2023-09-09	80
10	10	2023-10-25	1500

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

```
update vehicle set dailyrate = 68 where make = "mercedes";
select * from vehicle;
```

vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity
1	toyata	camry	2022	50	notavailable	4	1450
2	honda	civic	2023	45	notavailable	7	1500
3	ford	focus	2022	48	available	4	1400
4	nissan	altima	2023	52	notavailable	7	1200
5	cheverlot	mailbu	2022	47	notavailable	4	1800
6	hyundai	sanata	2023	49	available	7	1400
7	bmw	3 serier	2023	60	notavailable	7	2499
8	mercedes	c class	2022	68	notavailable	8	2599
9	audi	a4	2022	55	available	4	2500
10	lexus	es	2023	54	notavailable	4	2500

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

Considering customer id = 1

```
delete from payment where leaseid = (select leaseid from lease where customerid = "1");
delete from lease where customerid = "1";
delete from customer where customerid = "1";
```

CustomerID	FirstName	LastName	Email	Phone
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@examp	555-765-4321

leaseid	vehicleid	customerid	startdate	enddate	type
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

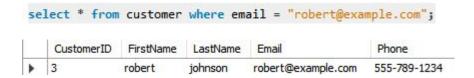| paymentid	leaseid	paymentdate	amount
2	2	2023-02-20	1000
3	3	2023-03-12	75
4	4	2023-04-25	900
5	5	2023-05-07	60
6	6	2023-06-18	1200
7	7	2023-07-03	40
8	8	2023-08-14	1100
9	9	2023-09-09	80
10	10	2023-10-25	1500

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

```
alter table payment rename column paymentdate to transactiondate;
```

paymentid	leaseid	transactiondate	amount
2	2	2023-02-20	1000
3	3	2023-03-12	75
4	4	2023-04-25	900
5	5	2023-05-07	60
6	6	2023-06-18	1200
7	7	2023-07-03	40
8	8	2023-08-14	1100
9	9	2023-09-09	80
10	10	2023-10-25	1500

4. Find a specific customer by email.

Consider email = robert@example.com

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

	CustomerID	FirstName	LastName	Email	Phone
▶	3	robert	johnson	robert@example.com	555-789-1234

5. Get active leases for a specific customer.

Inserting active lease for customer 2

```sql
insert into lease values (11, 2, 2, "2024-1-15", "2024-2-15", "monthly");
select * from lease where customerid = 2 and now() between startdate and enddate;
```

	leaseid	vehicleid	customerid	startdate	enddate	type
▶	11	2	2	2024-01-15	2024-02-15	monthly

Lease table

	leaseid	vehicleid	customerid	startdate	enddate	type
▶	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
	11	2	2	2024-01-15	2024-02-15	monthly

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

Consider phone = '555-789-1234'

```sql
select * from payment where leaseid
in (select leaseid from lease where customerid
in (select customerid from customer where phone = '555-789-1234'));
```

	paymentid	leaseid	transactiondate	amount
▶	3	3	2023-03-12	75
	6	6	2023-06-18	1200
	9	9	2023-09-09	80

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

```sql
select avg(dailyrate) as Daily_avg_rate from vehicle
group by statue having statue = "available";
```

Daily_avg_rate
50.6667

8. Find the car with the highest daily rate.

```sql
select * from vehicle
where dailyrate = (select max(dailyrate) from vehicle);
```

vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity
8	mercedes	c class	2022	68	notavailable	8	2599

9. Retrieve all cars leased by a specific customer.

Consider customer 3

```sql
select * from vehicle where vehicleid in (select vehicleid from lease where customerid = 3);
```

vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity
3	ford	focus	2022	48	available	4	1400
4	nissan	altima	2023	52	notavailable	7	1200

10. Find the details of the most recent lease.

Last 5 recent leases

```sql
select * from lease order by enddate desc limit 5;
```

leaseid	vehicleid	customerid	startdate	enddate	type
11	2	2	2024-01-15	2024-02-15	monthly
10	10	10	2023-10-10	2023-10-31	monthly
9	3	3	2023-09-07	2023-09-10	daily
8	8	8	2023-08-12	2023-08-15	monthly
7	7	7	2023-07-01	2023-07-10	daily

11. List all payments made in the year 2023.

```sql
select * from payment where year(transactiondate) = "2023";
```

paymentid	leaseid	transactiondate	amount
2	2	2023-02-20	1000
3	3	2023-03-12	75
4	4	2023-04-25	900
5	5	2023-05-07	60
6	6	2023-06-18	1200
7	7	2023-07-03	40
8	8	2023-08-14	1100
9	9	2023-09-09	80
10	10	2023-10-25	1500

12. Retrieve customers who have not made any payments.

```sql
select * from customer
where customerid not in
(select customerid from lease
where leaseid in (select leaseid from payment));
```

CustomerID	FirstName	LastName	Email	Phone
6	laura	hall	laura@example.com	555-234-5678
9	william	taylor	william@example.com	555-321-6547

13. Retrieve Car Details and Their Total Payments.

```sql
select vehicle.vehicleid, vehicle.make, vehicle.model,
    vehicle.year, vehicle.dailyrate, vehicle.statue,
    sum(payment.amount) as total_amount
    from vehicle join lease on vehicle.vehicleid = lease.vehicleid
    join payment on lease.leaseid = payment.leaseid
    group by
    vehicle.vehicleid, vehicle.make, vehicle.model,
    vehicle.year, vehicle.dailyrate, vehicle.statue;
```

vehicleid	make	model	year	dailyrate	statue	total_amount
2	honda	civic	2023	45	notavailable	1000
3	ford	focus	2022	48	available	155
4	nissan	altima	2023	52	notavailable	2100
5	cheverlot	mailbu	2022	47	notavailable	60
7	bmw	3 serier	2023	60	notavailable	40
8	mercedes	c class	2022	68	notavailable	1100
10	lexus	es	2023	54	notavailable	1500

14. Calculate Total Payments for Each Customer.

```sql
select customer.customerid, sum(amount) as total_payment
from customer
join lease on customer.customerid = lease.customerid
join payment on lease.leaseid = payment.leaseid
group by customer.customerid;
```

customerid	total_payment
2	1000
3	1355
4	900
5	60
7	40
8	1100
10	1500

15. List Car Details for Each Lease.

```sql
select * from lease join vehicle on lease.vehicleid = vehicle.vehicleid;
```

leaseid	vehicleid	customerid	startdate	enddate	type	vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity
2	2	2	2023-02-15	2023-02-28	monthly	2	honda	civic	2023	45	notavailable	7	1500
3	3	3	2023-03-10	2023-03-15	daily	3	ford	focus	2022	48	available	4	1400
4	4	4	2023-04-20	2023-04-30	monthly	4	nissan	altima	2023	52	notavailable	7	1200
5	5	5	2023-05-05	2023-05-10	daily	5	cheverlot	mailbu	2022	47	notavailable	4	1800
6	4	3	2023-06-15	2023-06-30	monthly	4	nissan	altima	2023	52	notavailable	7	1200
7	7	7	2023-07-01	2023-07-10	daily	7	bmw	3 serier	2023	60	notavailable	7	2499
8	8	8	2023-08-12	2023-08-15	monthly	8	mercedes	c class	2022	68	notavailable	8	2599
9	3	3	2023-09-07	2023-09-10	daily	3	ford	focus	2022	48	available	4	1400
10	10	10	2023-10-10	2023-10-31	monthly	10	lexus	es	2023	54	notavailable	4	2500
11	2	2	2024-01-15	2024-02-15	monthly	2	honda	civic	2023	45	notavailable	7	1500

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

```sql
select * from lease
join vehicle on lease.vehicleid = vehicle.vehicleid
join customer on lease.customerid = customer.customerid
where now() between startdate and enddate;
```

leaseid	vehicleid	customerid	startdate	enddate	type	vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity	CustomerID	FirstName	LastName	Email	Phone
11	2	2	2024-01-15	2024-02-15	monthly	2	honda	civic	2023	45	notavailable	7	1500	2	jane	smith	janesmith@example.com	555-123-4567

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

```sql
select customer.customerid, customer.firstname, customer.lastname,
    sum(amount) as total_amt
    from customer join lease on customer.customerid = lease.customerid
    join payment on lease.leaseid = payment.leaseid
    group by customer.customerid
    having total_amt = (select max(total_amt)
    from (select sum(amount) as total_amt from customer
    join lease on customer.customerid = lease.customerid
    join payment on lease.leaseid = payment.leaseid
    group by customer.customerid) as sub);
```

customerid	firstname	lastname	total_amt
10	olivia	adams	1500

18. List All Cars with Their Current Lease Information.

To select current lease vehicle info

```sql
select * from vehicle
join lease on vehicle.vehicleid = lease.vehicleid
where now() between startdate and enddate;
```

vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity	leaseid	vehicleid	customerid	startdate	enddate	type
2	honda	civic	2023	45	notavailable	7	1500	11	2	2	2024-01-15	2024-02-15	monthly

to select last lease for all vehicle info

```sql
select * from vehicle
join lease on vehicle.vehicleid = lease.vehicleid
where (Make, Model, Year) in
(select vehicle.Make, vehicle.Model, vehicle.Year from vehicle
join lease on vehicle.vehicleid = lease.vehicleid
where EndDate <= CURDATE() group by vehicle.Make, vehicle.Model, vehicle.Year
having MAX(EndDate) = EndDate) order by vehicle.vehicleid;
```

vehicleid	make	model	year	dailyrate	statue	passengercapacity	enginecapacity	leaseid	vehicleid	customerid	startdate	enddate	type
2	honda	civic	2023	45	notavailable	7	1500	2	2	2	2023-02-15	2023-02-28	monthly
3	ford	focus	2022	48	available	4	1400	9	3	3	2023-09-07	2023-09-10	daily
4	nissan	altima	2023	52	notavailable	7	1200	6	4	3	2023-06-15	2023-06-30	monthly
5	cheverlot	mailbu	2022	47	notavailable	4	1800	5	5	5	2023-05-05	2023-05-10	daily
7	bmw	3 serier	2023	60	notavailable	7	2499	7	7	7	2023-07-01	2023-07-10	daily
8	mercedes	c class	2022	68	notavailable	8	2599	8	8	8	2023-08-12	2023-08-15	monthly
10	lexus	es	2023	54	notavailable	4	2500	10	10	10	2023-10-10	2023-10-31	monthly