Coding Challenge – 4

Car Rental System – SQL

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- Create Database :

```
mysql> create database CarRentalSystem;
Query OK, 1 row affected (0.04 sec)

mysql> use CarRentalSystem
Database changed
```

- Create tables and show their schemas.
- Vehicle

```
mysql> 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
    -> );
Query OK, 0 rows affected (0.11 sec)

mysql> desc Vehicle;
+------------------+--------------+------+-----+---------+-------+
| Field            | Type         | Null | Key | Default | Extra |
+------------------+--------------+------+-----+---------+-------+
| vehicleID        | int          | NO   | PRI | NULL    |       |
| make             | varchar(255) | YES  |     | NULL    |       |
| model            | varchar(255) | YES  |     | NULL    |       |
| year             | int          | YES  |     | NULL    |       |
| dailyRate        | decimal(10,2)| YES  |     | NULL    |       |
| status           | varchar(20)  | YES  |     | NULL    |       |
| passengerCapacity| int          | YES  |     | NULL    |       |
| engineCapacity   | int          | YES  |     | NULL    |       |
+------------------+--------------+------+-----+---------+-------+
8 rows in set (0.01 sec)
```

- Customer

```
mysql> create table Customer (
    -> customerID int primary key,
    -> firstName varchar(255),
    -> lastName varchar(255),
    -> email varchar(255),
    -> phoneNumber varchar(15)
    -> );
Query OK, 0 rows affected (0.08 sec)

mysql> desc Customer;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| customerID  | int         | NO   | PRI | NULL    |       |
| firstName   | varchar(255) | YES  |     | NULL    |       |
| lastName    | varchar(255) | YES  |     | NULL    |       |
| email       | varchar(255) | YES  |     | NULL    |       |
| phoneNumber | varchar(15)  | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
5 rows in set (0.01 sec)
```

- Lease

```
mysql> create table Lease (
    -> leaseID int primary key,
    -> vehicleID int,
    -> customerID int,
    -> startDate date,
    -> endDate date,
    -> type varchar(30) check(type in ('DailyLease','MonthlyLease')),
    -> foreign key (vehicleID) references Vehicle(vehicleID),
    -> foreign key(customerID) references Customer(customerID)
    -> );
Query OK, 0 rows affected (0.11 sec)

mysql> desc Lease;
+------------+------------+------+-----+---------+-------+
| Field      | Type       | Null | Key | Default | Extra |
+------------+------------+------+-----+---------+-------+
| leaseID    | int        | NO   | PRI | NULL    |       |
| vehicleID  | int        | YES  | MUL | NULL    |       |
| customerID | int        | YES  | MUL | NULL    |       |
| startDate  | date       | YES  |     | NULL    |       |
| endDate    | date       | YES  |     | NULL    |       |
| type       | varchar(30) | YES  |     | NULL    |       |
+------------+------------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

- Payment

```
mysql> create table Payment (
    -> paymentID int primary key,
    -> leaseID int,
    -> paymentDate date,
    -> amount decimal(10,2)
    -> );
Query OK, 0 rows affected (0.04 sec)

mysql> desc Payment;
+-------------+---------------+------+-----+---------+-------+
| Field       | Type          | Null | Key | Default | Extra |
+-------------+---------------+------+-----+---------+-------+
| paymentID   | int           | NO   | PRI | NULL    |       |
| leaseID     | int           | YES  |     | NULL    |       |
| paymentDate | date          | YES  |     | NULL    |       |
| amount      | decimal(10,2) | YES  |     | NULL    |       |
+-------------+---------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

- Insert the values in the following tables :
- Vehicle

```
mysql> 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);
Query OK, 10 rows affected (0.03 sec)
Records: 10  Duplicates: 0  Warnings: 0

mysql> select * from Vehicle;
+-----------+-----------+----------+------+-----------+--------------+-------------------+----------------+
| vehicleID | make      | model    | year | dailyRate | status       | passengerCapacity | engineCapacity |
+-----------+-----------+----------+------+-----------+--------------+-------------------+----------------+
|         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 |
+-----------+-----------+----------+------+-----------+--------------+-------------------+----------------+
10 rows in set (0.00 sec)
```

- Customer

```
mysql> 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');
Query OK, 10 rows affected (0.02 sec)
Records: 10  Duplicates: 0  Warnings: 0

mysql> select * from Customer;
+------------+-----------+----------+----------------------+--------------+
| customerID | firstName | lastName | email                | phoneNumber  |
+------------+-----------+----------+----------------------+--------------+
|          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 |
+------------+-----------+----------+----------------------+--------------+
10 rows in set (0.00 sec)
```

- Lease

```
mysql> 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');
Query OK, 10 rows affected (0.02 sec)
Records: 10  Duplicates: 0  Warnings: 0

mysql> select * from Lease;
+---------+-----------+------------+------------+------------+-------------+
| leaseID | vehicleID | customerID | startDate  | endDate    | type        |
+---------+-----------+------------+------------+------------+-------------+
|       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 |
+---------+-----------+------------+------------+------------+-------------+
10 rows in set (0.00 sec)
```

- Payment

```
mysql> 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);
Query OK, 10 rows affected (0.01 sec)
Records: 10  Duplicates: 0  Warnings: 0

mysql> select * from Payment;
+-----------+---------+-------------+---------+
| paymentID | leaseID | paymentDate | amount  |
+-----------+---------+-------------+---------+
|         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 |
+-----------+---------+-------------+---------+
10 rows in set (0.00 sec)
```

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

```
mysql> update Vehicle set dailyRate = 68.00 where make = 'Mercedes';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from Vehicle;
+-----------+-----------+----------+------+-----------+--------------+-------------------+----------------+
| vehicleID | make      | model    | year | dailyRate | status       | passengerCapacity | engineCapacity |
+-----------+-----------+----------+------+-----------+--------------+-------------------+----------------+
|         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 |     68.00 | available    |                 8 |           2599 |
|         9 | Audi      | A4       | 2022 |     55.00 | notAvailable |                 4 |           2500 |
|        10 | Lexus     | ES       | 2023 |     54.00 | available    |                 4 |           2500 |
+-----------+-----------+----------+------+-----------+--------------+-------------------+----------------+
10 rows in set (0.00 sec)
```

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

```
mysql> delete from Payment where leaseId in (select leaseID from Lease where customerID = 2);
Query OK, 1 row affected (0.01 sec)

mysql> delete from Lease where customerID = 2;
Query OK, 1 row affected (0.01 sec)

mysql> delete from Customer where customerID = 2;
Query OK, 1 row affected (0.01 sec)

mysql> select * from Customer;
+------------+-----------+----------+---------------------+--------------+
| customerID | firstName | lastName | email               | phoneNumber  |
+------------+-----------+----------+---------------------+--------------+
|          1 | John      | Doe      | johndoe@example.com | 555-555-5555 |
|          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 |
+------------+-----------+----------+---------------------+--------------+
9 rows in set (0.00 sec)

mysql> select * from lease;
+---------+-----------+------------+------------+------------+--------------+
| leaseID | vehicleID | customerID | startDate  | endDate    | type         |
+---------+-----------+------------+------------+------------+--------------+
|       1 |         1 |          1 | 2023-01-01 | 2023-01-05 | DailyLease   |
|       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 |
+---------+-----------+------------+------------+------------+--------------+
```

```
mysql> select * from Payment;
+-----------+---------+-------------+---------+
| paymentID | leaseID | paymentDate | amount  |
+-----------+---------+-------------+---------+
|         1 |       1 | 2023-01-03  |  200.00 |
|         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 |
+-----------+---------+-------------+---------+
9 rows in set (0.00 sec)
```

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

```
mysql> alter table Payment rename column paymentDate to transactionDate;
Query OK, 0 rows affected (0.06 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Payment;
+-----------------+---------------+------+-----+---------+-------+
| Field           | Type          | Null | Key | Default | Extra |
+-----------------+---------------+------+-----+---------+-------+
| paymentID       | int           | NO   | PRI | NULL    |       |
| leaseID         | int           | YES  |     | NULL    |       |
| transactionDate | date          | YES  |     | NULL    |       |
| amount          | decimal(10,2) | YES  |     | NULL    |       |
+-----------------+---------------+------+-----+---------+-------+
4 rows in set (0.01 sec)
```

4. Find a specific customer by email.

```
mysql> select * from Customer where email = 'robert@example.com';
+------------+-----------+----------+--------------------+--------------+
| customerID | firstName | lastName | email              | phoneNumber  |
+------------+-----------+----------+--------------------+--------------+
|          3 | Robert    | Johnson  | robert@example.com | 555-789-1234 |
+------------+-----------+----------+--------------------+--------------+
1 row in set (0.00 sec)
```

5. Get active leases for a specific customer.

```
mysql> select Lease.*,Vehicle.make,Vehicle.model from Lease
    -> join Vehicle on Lease.vehicleID = Vehicle.vehicleID where lease.customerID = 8
    -> and Lease.endDate >= '2023-07-14';
+---------+-----------+------------+------------+------------+-------------+----------+---------+
| leaseID | vehicleID | customerID | startDate  | endDate    | type        | make     | model   |
+---------+-----------+------------+------------+------------+-------------+----------+---------+
|       8 |         8 |          8 | 2023-08-12 | 2023-08-15 | MonthlyLease | Mercedes | C-Class |
+---------+-----------+------------+------------+------------+-------------+----------+---------+
1 row in set (0.00 sec)
```

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

```
mysql> select Payment.*,Lease.startDate,Lease.endDate,Vehicle.make,Vehicle.model from Payment
    -> join Lease on Payment.leaseID = Lease.leaseID
    -> join Vehicle on Lease.vehicleID = vehicle.vehicleID
    -> join Customer on Lease.customerID = Customer.customerID
    -> where Customer.phoneNumber = '555-555-5555';
+-----------+---------+-----------------+--------+------------+------------+--------+-------+
| paymentID | leaseID | transactionDate | amount | startDate  | endDate    | make   | model |
+-----------+---------+-----------------+--------+------------+------------+--------+-------+
|         1 |       1 | 2023-01-03      | 200.00 | 2023-01-01 | 2023-01-05 | Toyota | Camry |
+-----------+---------+-----------------+--------+------------+------------+--------+-------+
1 row in set (0.01 sec)
```

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

```
mysql> select avg(dailyRate) as AvgDailyRate from Vehicle where status = 'available';
+--------------+
| AvgDailyRate |
+--------------+
|    53.714286 |
+--------------+
1 row in set (0.00 sec)
```

8. Find the car with the highest daily rate.

```
mysql> select * from Vehicle order by dailyRate desc
    -> limit 1;
+-----------+----------+---------+------+-----------+-----------+-------------------+----------------+
| vehicleID | make     | model   | year | dailyRate | status    | passengerCapacity | engineCapacity |
+-----------+----------+---------+------+-----------+-----------+-------------------+----------------+
|         8 | Mercedes | C-Class | 2022 |     68.00 | available |                 8 |           2599 |
+-----------+----------+---------+------+-----------+-----------+-------------------+----------------+
1 row in set (0.00 sec)
```

9. Retrieve all cars leased by a specific customer.

```
mysql> select Vehicle.* from Vehicle
    -> join Lease on Vehicle.vehicleID = Lease.vehicleID
    -> where Lease.customerID = 5;
+-----------+-----------+--------+------+-----------+-----------+-------------------+----------------+
| vehicleID | make      | model  | year | dailyRate | status    | passengerCapacity | engineCapacity |
+-----------+-----------+--------+------+-----------+-----------+-------------------+----------------+
|         5 | Chevrolet | Malibu | 2022 |     47.00 | available |                 4 |           1800 |
+-----------+-----------+--------+------+-----------+-----------+-------------------+----------------+
1 row in set (0.00 sec)
```

10. Find the details of the most recent lease.

```
mysql> select * from Lease order by startDate desc
    -> limit 1;
+---------+-----------+------------+------------+------------+--------------+
| leaseID | vehicleID | customerID | startDate  | endDate    | type         |
+---------+-----------+------------+------------+------------+--------------+
|      10 |        10 |         10 | 2023-10-10 | 2023-10-31 | MonthlyLease |
+---------+-----------+------------+------------+------------+--------------+
1 row in set (0.00 sec)
```

11. List all payments made in the year 2023.

```
mysql> select Payment.* from Payment where year(payment.transactionDate) = 2023;
+-----------+---------+-----------------+---------+
| paymentID | leaseID | transactionDate | amount  |
+-----------+---------+-----------------+---------+
|         1 |       1 | 2023-01-03      |  200.00 |
|         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 |
+-----------+---------+-----------------+---------+
9 rows in set (0.01 sec)
```

12. Retrieve customers who have not made any payments.

```
mysql> select Customer.* from Customer
    -> left join Lease on Customer.customerID = Lease.customerID
    -> left join Payment on Lease.leaseID = Payment.leaseID
    -> where Payment.paymentID is null;
+------------+-----------+----------+---------------------+--------------+
| customerID | firstName | lastName | email               | phoneNumber  |
+------------+-----------+----------+---------------------+--------------+
|          6 | Laura     | Hall     | laura@example.com   | 555-234-5678 |
|          9 | William   | Taylor   | william@example.com | 555-321-6547 |
+------------+-----------+----------+---------------------+--------------+
2 rows in set (0.01 sec)
```

13. Retrieve Car Details and Their Total Payments.

```
mysql> select Vehicle.vehicleID,Vehicle.make,Vehicle.model, sum(Payment.amount) as TotalPayments from Vehicle
    -> join Lease on Vehicle.vehicleID = Lease.vehicleID
    -> join Payment on Lease.leaseID = Payment.leaseID
    -> group by  Vehicle.vehicleID, Vehicle.make, Vehicle.model;
+-----------+-----------+----------+---------------+
| vehicleID | make      | model    | TotalPayments |
+-----------+-----------+----------+---------------+
|         1 | Toyota    | Camry    |        200.00 |
|         3 | Ford      | Focus    |        155.00 |
|         4 | Nissan    | Altima   |       2100.00 |
|         5 | Chevrolet | Malibu   |         60.00 |
|         7 | BMW       | 3 Series |         40.00 |
|         8 | Mercedes  | C-Class  |       1100.00 |
|        10 | Lexus     | ES       |       1500.00 |
+-----------+-----------+----------+---------------+
7 rows in set (0.01 sec)
```

14. Calculate Total Payments for Each Customer.

```
mysql> select Customer.customerID,Customer.firstName,Customer.lastName, sum(Payment.amount) as totalPayment
    -> from Customer
    -> join Lease on Customer.customerID = Lease.customerID
    -> join Payment on Lease.leaseID = Payment.leaseID
    -> group by Customer.customerID,Customer.firstName,Customer.lastName;
+------------+-----------+----------+--------------+
| customerID | firstName | lastName | totalPayment |
+------------+-----------+----------+--------------+
|          1 | John      | Doe      |       200.00 |
|          3 | Robert    | Johnson  |      1355.00 |
|          4 | Sarah     | Brown    |       900.00 |
|          5 | David     | Lee      |        60.00 |
|          7 | Michael   | Davis    |        40.00 |
|          8 | Emma      | Wilson   |      1100.00 |
|         10 | Olivia    | Adams    |      1500.00 |
+------------+-----------+----------+--------------+
7 rows in set (0.01 sec)
```

15. List Car Details for Each Lease.

```
mysql> select Lease.leaseID,Vehicle.make,Vehicle.model,Lease.startDate,Lease.endDate
    -> from Lease
    -> join Vehicle on Lease.vehicleID = Vehicle.vehicleID;
+---------+-----------+----------+------------+------------+
| leaseID | make      | model    | startDate  | endDate    |
+---------+-----------+----------+------------+------------+
|       1 | Toyota    | Camry    | 2023-01-01 | 2023-01-05 |
|       3 | Ford      | Focus    | 2023-03-10 | 2023-03-15 |
|       4 | Nissan    | Altima   | 2023-04-20 | 2023-04-30 |
|       5 | Chevrolet | Malibu   | 2023-05-05 | 2023-05-10 |
|       6 | Nissan    | Altima   | 2023-06-15 | 2023-06-30 |
|       7 | BMW       | 3 Series | 2023-07-01 | 2023-07-10 |
|       8 | Mercedes  | C-Class  | 2023-08-12 | 2023-08-15 |
|       9 | Ford      | Focus    | 2023-09-07 | 2023-09-10 |
|      10 | Lexus     | ES       | 2023-10-10 | 2023-10-31 |
+---------+-----------+----------+------------+------------+
9 rows in set (0.00 sec)
```

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

```
mysql> select lease.*,customer.*,vehicle.* from Lease
    -> join Customer on Lease.customerID = Customer.customerID
    -> join Vehicle on Lease.vehicleID = Vehicle.vehicleID
    -> where '2023-06-15' between startDate and endDate;
+---------+-----------+------------+------------+------------+--------------+------------+-----------+----------+--------------------+--------------+-------
--+--------+--------+------+-----------+-----------+------------------+----------------+
| leaseID | vehicleID | customerID | startDate  | endDate    | type         | customerID | firstName | lastName | email              | phoneNumber  | vehicl
eID | make   | model  | year | dailyRate | status    | passengerCapacity | engineCapacity |
+---------+-----------+------------+------------+------------+--------------+------------+-----------+----------+--------------------+--------------+-------
--+--------+--------+------+-----------+-----------+------------------+----------------+
|       6 |         4 |          3 | 2023-06-15 | 2023-06-30 | MonthlyLease |          3 | Robert    | Johnson  | robert@example.com | 555-789-1234 |
  4 | Nissan | Altima | 2023 |     52.00 | available |                7 |           1200 |
+---------+-----------+------------+------------+------------+--------------+------------+-----------+----------+--------------------+--------------+-------
--+--------+--------+------+-----------+-----------+------------------+----------------+
1 row in set (0.00 sec)
```

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

```
mysql> select Customer.customerID,Customer.firstName,Customer.lastName, sum(Payment.amount) as TotalSpent
    -> from Customer
    -> join Lease on Customer.customerID = Lease.customerID
    -> join Payment on Lease.leaseID = Payment.leaseID
    -> group by Customer.customerID,Customer.firstName,Customer.lastName
    -> order by TotalSpent desc limit 1;
+------------+-----------+----------+------------+
| customerID | firstName | lastName | TotalSpent |
+------------+-----------+----------+------------+
|         10 | Olivia    | Adams    |    1500.00 |
+------------+-----------+----------+------------+
1 row in set (0.01 sec)
```

18. List All Cars with Their Current Lease Information.

```
mysql> select Vehicle.vehicleID,Vehicle.make,Vehicle.model,
    -> Lease.leaseID,Lease.startDate,Lease.endDate,
    -> Customer.firstName,Customer.lastName
    -> from Vehicle
    -> left join Lease on Vehicle.vehicleID = Lease.vehicleID
    -> left join Customer on Lease.customerID = Customer.customerID
    -> where Lease.endDate >= current_date or Lease.endDate is null;
+-----------+---------+--------+---------+-----------+---------+-----------+----------+
| vehicleID | make    | model  | leaseID | startDate | endDate | firstName | lastName |
+-----------+---------+--------+---------+-----------+---------+-----------+----------+
|         2 | Honda   | Civic  |    NULL | NULL      | NULL    | NULL      | NULL     |
|         6 | Hyundai | Sonata |    NULL | NULL      | NULL    | NULL      | NULL     |
|         9 | Audi    | A4     |    NULL | NULL      | NULL    | NULL      | NULL     |
+-----------+---------+--------+---------+-----------+---------+-----------+----------+
3 rows in set (0.00 sec)
```