**Car Rental System**

For making database for Car Rental System we have to first create database using CREATE command.

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| **Query:-** *create database carRentalSystem;* |

Next, we will connect to the database

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| **Query:-** *use carRentalSystem;* |

Now, it’s time to create tables in the database

**1) Vehicle Table**

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| **Query:-**  *create table vehicle (vehicleID int primary key, make varchar(15), model varchar(15),*  *year int, dailyRate decimal(5,2), status int, passengerCapacity int, engineCapacity int);* |

**2) Customer Table**

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| **Query:-**  *create table customer (customerID int primary key, firstname varchar(10),*  *lastname varchar(10), email varchar(50), phoneNumber varchar(15));* |

**3) Lease Table**

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| **Query:-**  *create table lease (leaseID int primary key, vehicleID int, customerID int, startDate date, endDate date, leaseType varchar(10), foreign key (vehicleID) references vehicle(vehicleID),foreign key (customerID) references customer(customerID));* |

**4) Payment Table**

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| **Query:-**  *create table payment (paymentID int primary key, leaseID int, paymentDate date,*  *amount float, foreign key (leaseID) references lease(leaseID));* |

After creating tables, we will now insert given data

**1) Vehicle Table**

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| **Query:-**  *insert into vehicle 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',2023,60.00,1,4,2499),*  *(8,'Mercedes','C-Class',2022,58.00,1,4,2599),*  *(9,'Audi','A4',2022,55.00,0,4,2500),*  *(10,'Lexus','ES',2023,54.00,1,4,2500);* |

**2) Customer Table**

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| **Query:-**  *insert into customer values*  *(1,'John','Doe','johndoe@example.com','555-555-5555'),*  *(2,'Jane','Smith','janesmith@example.com','555-123-4567'),*  *(3,'Robert','Johnsn','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','Hill','laura@example.com','555-234-5678'),*  *(7,'Michael','David','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,'Olivie','Adams','olivia@example.com','555-765-4321');* |

**3) Lease Table**

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| **Query:-**  *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');* |

**4) Payment Table**

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| **Query:-**  insert into payment 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);* |

Now we will write MySQL queries for given questions.

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

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| **Query:-**  *update table vehicle set dailyRate = 68.00 where make = ‘Mercedes’;* |

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

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| **Queries:-**  *delete from payment where leaseID in (select leaseID from lease where customerID=7);*  *delete from lease where customerID=7;*  *delete from customer where customerID=7;* |

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

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| **Query:-**  *Alter table payment rename column paymentDate to transactionDate;* |

**4. Find a specific customer by email.**

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| **Query:-**  *select concat(firstname," ", lastname) as customerName from customer where email='sarah@example.com';* |

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

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| **Query:-**  *select \* from lease where customerID=3 and endDate>='2023-06-30';* |

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

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| **Query:-**  *select p.\* from payment p where leaseID in (select l.leaseID from lease l join customer c on c.customerID=l.customerID where c.phoneNumber='555-555-5555');* |

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

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| **Query:-**  *select avg(dailyRate) as AvgDailyRate from vehicle where status=1;* |

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

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| **Query:-**  *select make as carName, dailyRate from vehicle where dailyRate= (select max(dailyRate) from vehicle);* |

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

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| **Query:-**  *select v.make as carName, c.customerID, l.leaseID from vehicle v join customer c join lease l on c.customerID = l.customerID and v.vehicleID = l.vehicleID where c.customerID=3;* |

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

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| **Query:-**  *select l.\*, v.make, v.model, c.firstname, c.lastname from lease l join vehicle v join customer c on l.vehicleID = v.vehicleID and l.customerID = c.customerID order by l.startDate DESC limit 1;* |

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

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| **Query:-**  *select \* from payment where transactionDate between '2023-01-01' and '2023-12-31';* |

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

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| **Query:-**  *select c.\* from customer c left join lease l on c.customerID = l.customerID left join payment p on l.leaseID = p.leaseID where paymentID is null;* |

**13. Retrieve Car Details and Their Total Payments.**

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| **Query:-**  *select v.vehicleID, v.make, v.model, v.year, sum(p.amount) as totalPayments from vehicle v join lease l join payment p on v.vehicleID = l.vehicleID and l.leaseID = p.leaseID group by v.vehicleID, v.make, v.model, v.year;* |

**14. Calculate Total Payments for Each Customer.**

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| **Query:-**  *select c.customerID, concat(c.firstname," ",c.lastname) as customerName, sum(p.amount) from customer c left join lease l on c.customerID = l.customerID left join payment p on l.leaseID = p.leaseID group by c.customerID, c.firstname, c.lastname;* |

**15. List Car Details for Each Lease.**

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| **Query:-**  *select l.leaseID, v.vehicleID, v.make, v.model, v.year, l.startDate, l.endDate, l.leaseType from lease l join vehicle v on l.vehicleID = v.vehicleID;* |

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

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| **Query:-**  *select l.leaseID, c.customerID, c.firstname, c.lastname, v.vehicleID, v.make, v.model, v.year, l.startDate, l.endDate, l.leaseType from lease l join customer c join vehicle v on l.customerID = c.customerID and l.vehicleID = v.vehicleID where l.endDate>'2023-06-30';* |

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

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| **Query:-**  *select c.customerID, c.firstname, c.lastname, SUM(p.amount) as mostSpent from customer c join lease l join payment p on c.customerID = l.customerID and l.leaseID = p.leaseID group by c.customerID, c.firstname, c.lastname order by mostSpent desc limit 1;* |

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

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| **Query:-**  *select v.vehicleID, v.make, v.model, v.year, l.leaseID, l.customerID, l.startDate, l.endDate, l.leaseType from vehicle v left join lease l on v.vehicleID = l.vehicleID ;* |