Assignment 4

Courier Management System

Task 1: Database Design

Design a SQL schema for a Courier Management System with tables for Customers, Couriers, Orders,and Parcels. Define the relationships between these tables using appropriate foreign keys.

Requirements:

• Define the Database Schema • Create SQL tables for entities such as User, Courier,Employee, Location, Payment.
• Define relationships between these tables (one-to-many, many-to-many, etc.).
• Populate Sample Data • Insert sample data into the tables to simulate real-world scenarios.

User Table:

User

```sql
CREATE TABLE Users (
    UserID INT PRIMARY KEY,
    Name VARCHAR(255),
    Email VARCHAR(255) UNIQUE,
    Password VARCHAR(255),
    ContactNumber VARCHAR(20),
    Address TEXT
);
```

Messages

23:20:02   Started executing query at Line 4
            Commands completed successfully.
            Total execution time: 00:00:00.019

CourierServices

```sql
CREATE TABLE CourierServices (
    ServiceID INT PRIMARY KEY,
    ServiceName VARCHAR(100),
    Cost DECIMAL(8, 2)
);
```

Messages

23:22:05   Started executing query at Line 25
            Commands completed successfully.
            Total execution time: 00:00:00.022

Courier

```sql
CREATE TABLE Courier (
    CourierID INT PRIMARY KEY,
    SenderName VARCHAR(255),
    SenderAddress TEXT,
    ReceiverName VARCHAR(255),
    ReceiverAddress TEXT,
    Weight DECIMAL(5, 2),
    Status VARCHAR(50),
    TrackingNumber VARCHAR(20) UNIQUE,
    DeliveryDate DATE
);
```

Messages

23:21:01   Started executing query at Line 13
            Commands completed successfully.
            Total execution time: 00:00:00.042

Employee Table:

```sql
CREATE TABLE Employee (
    EmployeeID INT PRIMARY KEY,
    Name VARCHAR(255),
    Email VARCHAR(255) UNIQUE,
    ContactNumber VARCHAR(20),
    Role VARCHAR(50),
    Salary DECIMAL(10, 2)
);
```

Messages

23:22:56   Started executing query at Line 31
            Commands completed successfully.
            Total execution time: 00:00:00.045

Location Table:

```
39
40   CREATE TABLE Location (
41       LocationID INT PRIMARY KEY,
42       LocationName VARCHAR(100),
43       Address TEXT
44   );
45
```
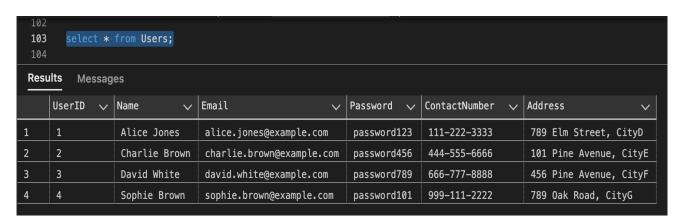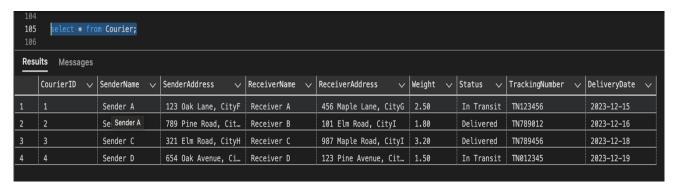
Messages

```
23:23:20    Started executing query at Line 40
            Commands completed successfully.
            Total execution time: 00:00:00.053
```

Payment Table:

```
46   CREATE TABLE Payment (
47       PaymentID INT PRIMARY KEY,
48       CourierID INT,
49       LocationID INT,
50       Amount DECIMAL(10, 2),
51       PaymentDate DATE,
52       FOREIGN KEY (CourierID) REFERENCES Courier(CourierID),
53       FOREIGN KEY (LocationID) REFERENCES Location(LocationID)
54   );
55
```

Messages

```
23:23:44    Started executing query at Line 46
            Commands completed successfully.
            Total execution time: 00:00:00.026
```

Inserted sample data into Users table, Courier table, CourierServices table, Employee table, Locations table, Payments table.

Task 2: Select,Where

```
102
103   select * from Users;
104
```

Results   Messages

	UserID	Name	Email	Password	ContactNumber	Address
1	1	Alice Jones	alice.jones@example.com	password123	111-222-3333	789 Elm Street, CityD
2	2	Charlie Brown	charlie.brown@example.com	password456	444-555-6666	101 Pine Avenue, CityE
3	3	David White	david.white@example.com	password789	666-777-8888	456 Pine Avenue, CityF
4	4	Sophie Brown	sophie.brown@example.com	password101	999-111-2222	789 Oak Road, CityG

```
104
105   select * from Courier;
106
```

Results   Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15
2	2	Se Sender A	789 Pine Road, Cit…	Receiver B	101 Elm Road, CityI	1.80	Delivered	TN789012	2023-12-16
3	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18
4	4	Sender D	654 Oak Avenue, Ci…	Receiver D	123 Pine Avenue, Cit…	1.50	In Transit	TN012345	2023-12-19

```
106
107   select * from Courier where SenderName='Sender A';
108
```

Results   Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15

```sql
108
109  SELECT *
110  FROM Courier
111  WHERE CourierID = 1;
112
113  select * from Courier where Status = 'In Transit';
```
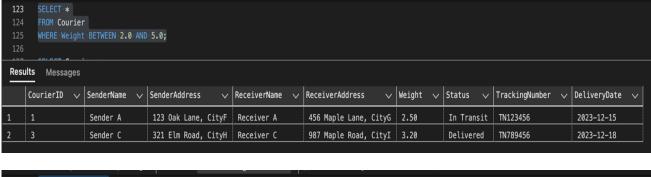
Results | Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15

```sql
112
113  select * from Courier where Status = 'In Transit';
114
```

Results | Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15
2	4	Sender D	654 Oak Avenue, CityJ	Receiver D	123 Pine Avenue, CityK	1.50	In Transit	TN012345	2023-12-19

```sql
114
115  SELECT *
116  FROM Courier
117  WHERE CAST(DeliveryDate AS DATE) = CAST(GETDATE() AS DATE);
118
```

Results | Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate

```sql
117  WHERE CAST(DeliveryDate AS DATE) = CAST(GETDATE() AS DATE);
118
119  select * from Courier where Status = 'Delivered';
120
121  select COUNT(SenderName )as package_count , SenderName from Courier Group by SenderName;
```

Results | Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	2	Sender B	789 Pine Road, CityH	Receiver B	101 Elm Road, CityI	1.80	Delivered	TN789012	2023-12-16
2	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18

```sql
120
121  select COUNT(SenderName )as package_count , SenderName from Courier Group by SenderName;
122
123  SELECT *
```

Results | Messages

	package_count	SenderName
1	1	Sender A
2	1	Sender B
3	1	Sender C
4	1	Sender D

```
123   SELECT *
124   FROM Courier
125   WHERE Weight BETWEEN 2.0 AND 5.0;
126
```

Results   Messages

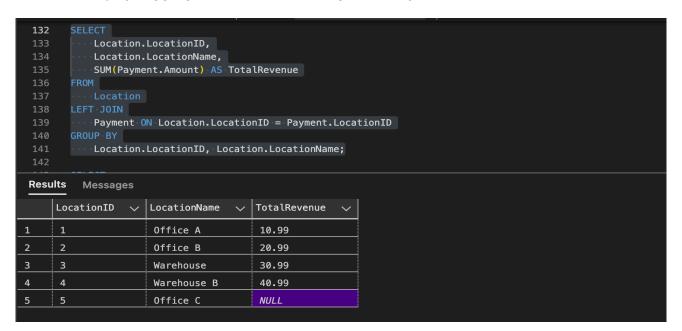|	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15
2	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18

```
127   SELECT Courier.*
128   FROM Courier
129   JOIN Payment ON Courier.CourierID = Payment.CourierID
130   WHERE Payment.Amount > 50.0;
131
```
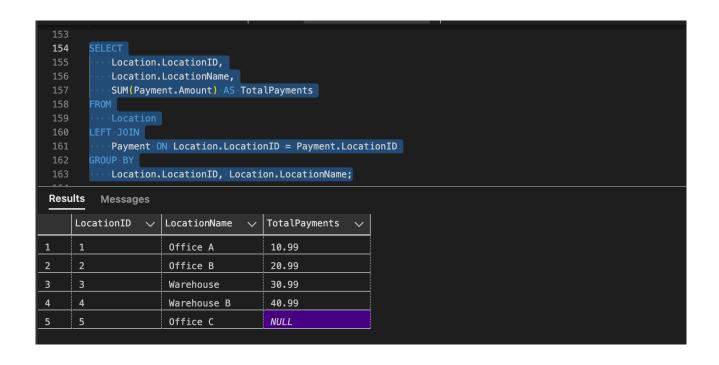
Results   Messages

CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate

Task 3: GroupBy, Aggregate Functions, Having, Order By, where

```
132   SELECT
133       Location.LocationID,
134       Location.LocationName,
135       SUM(Payment.Amount) AS TotalRevenue
136   FROM
137       Location
138   LEFT JOIN
139       Payment ON Location.LocationID = Payment.LocationID
140   GROUP BY
141       Location.LocationID, Location.LocationName;
142
```

Results   Messages

	LocationID	LocationName	TotalRevenue
1	1	Office A	10.99
2	2	Office B	20.99
3	3	Warehouse	30.99
4	4	Warehouse B	40.99
5	5	Office C	NULL

```
142
143   SELECT
144       Location.LocationID,
145       Location.LocationName,
146       COUNT(Courier.CourierID) AS TotalCouriersDelivered
147   FROM
148       Location
149   LEFT JOIN
150       Courier ON Location.LocationID = Courier.CourierID
151   GROUP BY
152       Location.LocationID, Location.LocationName;
153
```

Results   Messages

	LocationID	LocationName	TotalCouriersDelivered
1	1	Office A	1
2	2	Office B	1
3	3	Warehouse	1
4	4	Warehouse B	1
5	5	Office C	0

```sql
153
154    SELECT
155        Location.LocationID,
156        Location.LocationName,
157        SUM(Payment.Amount) AS TotalPayments
158    FROM
159        Location
160    LEFT JOIN
161        Payment ON Location.LocationID = Payment.LocationID
162    GROUP BY
163        Location.LocationID, Location.LocationName;
```

Results Messages

	LocationID	LocationName	TotalPayments
1	1	Office A	10.99
2	2	Office B	20.99
3	3	Warehouse	30.99
4	4	Warehouse B	40.99
5	5	Office C	NULL

Task 4: Inner Join,Full Outer Join, Cross Join, Left Outer Join,Right Outer Join

```sql
165
166    SELECT
167        Payment.PaymentID,
168        Payment.Amount,
169        Payment.PaymentDate,
170        Courier.*
171    FROM
172        Payment
173    JOIN
174        Courier ON Payment.CourierID = Courier.CourierID;
175
176    SELECT
177        Payment.PaymentID,
178        Payment.Amount,
```

Results Messages

	PaymentID	Amount	PaymentDate	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	10.99	2023-12-16	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15
2	2	20.99	2023-12-17	2	Sender B	789 Pine Road, CityH	Receiver B	101 Elm Road, CityI	1.80	Delivered	TN789012	2023-12-16
3	3	30.99	2023-12-19	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18
4	4	40.99	2023-12-20	4	Sender D	654 Oak Avenue, CityJ	Receiver D	123 Pine Avenue, CityK	1.50	In Transit	TN012345	2023-12-19

```sql
176    SELECT
177        Payment.PaymentID,
178        Payment.Amount,
179        Payment.PaymentDate,
180        Location.*
181    FROM
182        Payment
183    JOIN
184        Location ON Payment.LocationID = Location.LocationID;
185
```

Results Messages

	PaymentID	Amount	PaymentDate	LocationID	LocationName	Address
1	1	10.99	2023-12-16	1	Office A	123 Main Street, CityA
2	2	20.99	2023-12-17	2	Office B	456 Oak Street, CityB
3	3	30.99	2023-12-19	3	Warehouse	789 Pine Street, CityC
4	4	40.99	2023-12-20	4	Warehouse B	987 Cedar Street, CityD

```sql
185
186  SELECT
187      Payment.PaymentID,
188      Payment.Amount,
189      Payment.PaymentDate,
190      Courier.*
191  FROM
192      Payment
193  JOIN
194      Courier ON Payment.CourierID = Courier.CourierID;
195
196  SELECT
197      Payment.PaymentID,
```

Results | Messages

	PaymentID	Amount	PaymentDate	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	10.99	2023-12-16	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15
2	2	20.99	2023-12-17	2	Sender B	789 Pine Road, CityH	Receiver B	101 Elm Road, CityI	1.80	Delivered	TN789012	2023-12-16
3	3	30.99	2023-12-19	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18
4	4	40.99	2023-12-20	4	Sender D	654 Oak Avenue, CityJ	Receiver D	123 Pine Avenue, CityK	1.50	In Transit	TN012345	2023-12-19

```sql
196  SELECT
197      Payment.PaymentID,
198      Payment.Amount,
199      Payment.PaymentDate,
200      Courier.*
201  FROM
202      Payment
203  JOIN
204      Courier ON Payment.CourierID = Courier.CourierID;
205
```

Results | Messages

	PaymentID	Amount	PaymentDate	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate
1	1	10.99	2023-12-16	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15
2	2	20.99	2023-12-17	2	Sender B	789 Pine Road, CityH	Receiver B	101 Elm Road, CityI	1.80	Delivered	TN789012	2023-12-16
3	3	30.99	2023-12-19	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18
4	4	40.99	2023-12-20	4	Sender D	654 Oak Avenue, CityJ	Receiver D	123 Pine Avenue, CityK	1.50	In Transit	TN012345	2023-12-19

```sql
206  SELECT
207      Users.UserID,
208      Users.Name AS UserName,
209      CourierServices.ServiceID,
210      CourierServices.ServiceName,
211      CourierServices.Cost
212  FROM
213      Users
214  CROSS JOIN
215      CourierServices;
216
```

Results | Messages

	UserID	UserName	ServiceID	ServiceName	Cost
1	1	Alice Jones	1	Standard Delivery	10.99
2	1	Alice Jones	2	Express Delivery	20.99
3	1	Alice Jones	3	Same-Day Delivery	30.99
4	1	Alice Jones	4	Two-Day Delivery	15.99
5	1	Alice Jones	5	International Shipping	50.99
6	2	Charlie Brown	1	Standard Delivery	10.99
7	2	Charlie Brown	2	Express Delivery	20.99
8	2	Charlie Brown	3	Same-Day Delivery	30.99
9	2	Charlie Brown	4	Two-Day Delivery	15.99
10	2	Charlie Brown	5	International Shipping	50.99
11	3	David White	1	Standard Delivery	10.99
12	3	David White	2	Express Delivery	20.99
13	3	David White	3	Same-Day Delivery	30.99
14	3	David White	4	Two-Day Delivery	15.99
15	3	David White	5	International Shipping	50.99
16	4	Sophie Brown	1	Standard Delivery	10.99
17	4	Sophie Brown	2	Express Delivery	20.99
18	4	Sophie Brown	3	Same-Day Delivery	30.99
19	4	Sophie Brown	4	Two-Day Delivery	15.99
20	4	Sophie Brown	5	International Shipping	50.99

```sql
218  SELECT
219      Courier.*,
220      Users.Name AS SenderName,
221      Users.Address AS SenderAddress
222  FROM
223      Courier
224  LEFT JOIN
225      Users ON Courier.CourierID = Users.UserID;
226
```

Results Messages

	CourierID	SenderName	SenderAddress	ReceiverName	ReceiverAddress	Weight	Status	TrackingNumber	DeliveryDate	SenderName	SenderAddress
1	1	Sender A	123 Oak Lane, CityF	Receiver A	456 Maple Lane, CityG	2.50	In Transit	TN123456	2023-12-15	Alice Jones	789 Elm Street, CityD
2	2	Sender B	789 Pine Road, CityH	Receiver B	101 Elm Road, CityI	1.80	Delivered	TN789012	2023-12-16	Charlie Brown	101 Pine Avenue, CityE
3	3	Sender C	321 Elm Road, CityH	Receiver C	987 Maple Road, CityI	3.20	Delivered	TN789456	2023-12-18	David White	456 Pine Avenue, CityF
4	4	Sender D	654 Oak Avenue, CityJ	Receiver D	123 Pine Avenue, CityK	1.50	In Transit	TN012345	2023-12-19	Sophie Brown	789 Oak Road, CityG

```sql
226
227  SELECT
228      Name,
229      Salary
230  FROM
231      Employee
232  WHERE
233      Salary > (SELECT AVG(Salary) FROM Employee);
234
```

Results Messages

	Name	Salary
1	John Doe	60000.00
2	Sam Wilson	55000.00

```sql
234
235  SELECT
236      SUM(Cost) AS TotalCost
237  FROM
238      CourierServices
239  WHERE
240      Cost < (SELECT MAX(Cost) FROM CourierServices);
241
```

Results Messages

	TotalCost
1	78.96

```sql
242  SELECT
243      Location.LocationID,
244      Location.LocationName,
245      MAX(Payment.Amount) AS MaxPaymentAmount
246  FROM
247      Location
248  JOIN
249      Payment ON Location.LocationID = Payment.LocationID
250  GROUP BY
251      Location.LocationID, Location.LocationName
252  HAVING
253      MAX(Payment.Amount) IS NOT NULL;
```

Results   Messages

	LocationID	LocationName	MaxPaymentAmount
1	1	Office A	10.99
2	2	Office B	20.99
3	3	Warehouse	30.99
4	4	Warehouse B	40.99