

COURIER MANAGEMENT SYSTEM

COURIER MANAGEMENT SYSTEM

1- Introduction

The Courier Management System project aims to develop a comprehensive database solution to efficiently manage courier services. This system handles various entities such as customers, couriers, packages, shipments, and financial transactions. The project demonstrates the use of SQL to create a robust and scalable database structure, including tables, indexes, stored procedures, views, and triggers.

2- Problem Statement

Managing courier services involves handling a large volume of data related to customers, couriers, packages, shipments, and transactions. Without a well-structured database, it becomes challenging to ensure data consistency, integrity, and quick retrieval of information. The key issues faced are:

- Difficulty in tracking the status and details of packages.
- Managing customer and courier information.
- Recording financial transactions and generating revenue reports.
- Ensuring timely updates of package status upon delivery.

3- Recommended Solution

To address the identified problems, I propose a Courier Management System implemented using SQL. The solution involves creating a database with the following components:

Tables: To store detailed information about customers, couriers, packages, shipments, and financial transactions.

Indexes: To optimize query performance and ensure quick data retrieval.

Stored Procedures: For complex queries, such as calculating the total transaction amount for a customer.

Views: For generating reports like monthly shipment summaries and revenue billing reports.

Triggers: To automatically update package status upon delivery.

Database Schema

- **Customers Table:** Stores customer information.
- **Courier Table:** Stores courier personnel information.
- **Packages Table:** Records package details and their statuses.
- **Shipments Table:** Tracks shipment information, including delivery dates and current locations.
- **Finance Table:** Logs financial transactions related to shipments.

SQL Script Highlights

- **Indexes:** Created on primary keys and frequently queried columns to improve performance.
- **Stored Procedures:** GetCustomerTransactionAmount to calculate the total transaction amount for a specific customer.
- **Views:** MonthlyShipmentSummary and RevenueBillingReport for summarizing shipment and financial data.
- **Triggers:** UpdatePackageStatusOnDelivery to update the package status to 'Delivered' automatically when the shipment is marked as delivered.

4- Business Rules

1. **Customer Management:**
 - Each customer must have a unique ID and email address.
 - Customers' addresses and contact details should be accurately maintained.
2. **Courier Management:**
 - Each courier should have a unique ID and contact information.
 - The database should ensure the integrity of courier contact details.
3. **Package Tracking:**
 - Each package should be linked to a customer and a courier.
 - The package status should reflect its current state (e.g., In Transit, Delivered, Pending).
4. **Shipment Details:**
 - Each shipment must have a unique ID and should be linked to a package.
 - The shipment table should store the delivery date and current location.
5. **Financial Transactions:**
 - Each transaction should be linked to a shipment and must have a unique transaction ID.
 - The transaction amount and date should be accurately recorded.
6. **Automatic Status Updates:**
 - Use triggers to update package status automatically when a shipment is marked as delivered.

6- Code for table creation, constraints and insertion of 20 records in each table

CREATION OF COURIERMANAGEMENT TABLE

```
CREATE TABLE CourierManagement (  
    customer_id INT,  
    customer_name VARCHAR(255),  
    customer_address TEXT,  
    customer_phone VARCHAR(20),  
    customer_email VARCHAR(255),  
    courier_id INT,  
    courier_name VARCHAR(255),  
    courier_contact_number VARCHAR(20),  
    courier_email VARCHAR(255),  
    package_id INT,  
    package_weight DECIMAL(10, 2),  
    package_dimensions VARCHAR(100),  
    package_status VARCHAR(50),  
    package_date_sent DATE,  
    shipment_id INT,  
    shipment_date DATE,  
    shipment_delivery_date DATE,  
    shipment_current_location VARCHAR(255),  
    transaction_id INT,  
    transaction_amount DECIMAL(10, 2),  
    transaction_date DATE  
);
```

DATA INSERTION IN COURIERMANAGEMENT TABLE

INSERT INTO CourierManagement (customer_id, customer_name, customer_address, customer_phone, customer_email, courier_id, courier_name, courier_contact_number, courier_email, package_id, package_weight, package_dimensions, package_status, package_date_sent, shipment_id, shipment_date, shipment_delivery_date, shipment_current_location, transaction_id, transaction_amount, transaction_date) VALUES

(1, 'Ahmed Khan', '123 Main Street, Karachi, Pakistan', '0312-3456789', 'ahmed.khan@example.com', 1, 'Ali Raza', '0301-1122334', 'ali.raza@couriers.com', 1, 5.75, '30x20x15 cm', 'In Transit', '2024-06-10', 1, '2024-06-10', '2024-06-12', 'Karachi Hub', 1, 1500.00, '2024-06-12'),

(2, 'Fatima Ali', '456 Garden Town, Lahore, Pakistan', '0333-9876543', 'fatima.ali@example.com', 2, 'Sanaullah Khan', '0302-2233445', 'sanaullah.khan@couriers.com', 2, 3.50, '25x15x10 cm', 'Delivered', '2024-06-11', 2, '2024-06-11', '2024-06-13', 'Lahore Hub', 2, 1200.00, '2024-06-13'),

(3, 'Usman Iqbal', '789 Clifton, Karachi, Pakistan', '0301-2345678', 'usman.iqbal@example.com', 3, 'Rehan Shah', '0303-3344556', 'rehan.shah@couriers.com', 3, 7.20, '40x30x20 cm', 'In Transit', '2024-06-12', 3, '2024-06-12', '2024-06-14', 'Islamabad Hub', 3, 1800.00, '2024-06-14'),

(4, 'Sara Malik', '101 G-11/3, Islamabad, Pakistan', '0345-8765432', 'sara.malik@example.com', 4, 'Amir Khan', '0304-4455667', 'amir.khan@couriers.com', 4, 2.80, '20x15x10 cm', 'Pending', '2024-06-13', 4, '2024-06-13', '2024-06-15', 'Karachi Hub', 4, 900.00, '2024-06-15'),

(5, 'Ayesha Noor', '202 Model Town, Lahore, Pakistan', '0321-1234567', 'ayesha.noor@example.com', 5, 'Bilal Ahmed', '0305-5566778', 'bilal.ahmed@couriers.com', 5, 6.00, '35x25x15 cm', 'In Transit', '2024-06-14', 5, '2024-06-14', '2024-06-16', 'Lahore Hub', 5, 1600.00, '2024-06-16'),

(6, 'Bilal Zafar', '11 Iqbal Town, Faisalabad, Pakistan', '0302-3456789', 'bilal.zafar@example.com', 6, 'Farooq Malik', '0306-6677889', 'farooq.malik@couriers.com', 6, 4.25, '28x18x12 cm', 'In Transit', '2024-06-15', 6, '2024-06-15', '2024-06-17', 'Karachi Hub', 6, 1300.00, '2024-06-17'),

(7, 'Hina Tariq', '88 DHA Phase 6, Lahore, Pakistan', '0331-9876543', 'hina.tariq@example.com', 7, 'Kamran Sheikh', '0307-7788990', 'kamran.sheikh@couriers.com', 7, 3.75, '26x16x11 cm', 'Delivered', '2024-06-16', 7, '2024-06-16', '2024-06-18', 'Lahore Hub', 7, 1100.00, '2024-06-18'),

(8, 'Raza Qureshi', '14 Gulshan-e-Iqbal, Karachi, Pakistan', '0305-2345678', 'raza.qureshi@example.com', 8, 'Nadeem Raza', '0308-8899001', 'nadeem.raza@couriers.com', 8, 6.50, '38x28x18 cm', 'In Transit', '2024-06-17', 8, '2024-06-17', '2024-06-19', 'Islamabad Hub', 8, 1700.00, '2024-06-19'),

(9, 'Mariam Shah', '9 F-8/3, Islamabad, Pakistan', '0346-8765432', 'mariam.shah@example.com', 9, 'Saad Tariq', '0309-9900112', 'saad.tariq@couriers.com', 9, 2.90, '22x17x12 cm', 'Pending', '2024-06-18', 9, '2024-06-18', '2024-06-20', 'Karachi Hub', 9, 950.00, '2024-06-20'),

(10, 'Kamran Ahmed', '56 Satellite Town, Rawalpindi, Pakistan', '0323-1234567', 'kamran.ahmed@example.com', 10, 'Jamil Akhtar', '0310-1011122', 'jamil.akhtar@couriers.com', 10,

5.50, '34x24x14 cm', 'In Transit', '2024-06-19', 10, '2024-06-19', '2024-06-21', 'Lahore Hub', 10, 1500.00, '2024-06-21'),

(11, 'Sana Riaz', '112 Johar Town, Lahore, Pakistan', '0306-3456789', 'sana.riaz@example.com', 11, 'Irfan Haider', '0311-2122233', 'irfan.haider@couriers.com', 11, 3.10, '24x14x11 cm', 'Delivered', '2024-06-20', 11, '2024-06-20', '2024-06-22', 'Islamabad Hub', 11, 1150.00, '2024-06-22'),

(12, 'Tariq Hassan', '7 North Nazimabad, Karachi, Pakistan', '0314-9876543', 'tariq.hassan@example.com', 12, 'Yasir Qureshi', '0312-3233344', 'yasir.qureshi@couriers.com', 12, 7.60, '45x35x25 cm', 'In Transit', '2024-06-21', 12, '2024-06-21', '2024-06-23', 'Karachi Hub', 12, 1850.00, '2024-06-23'),

(13, 'Faisal Latif', '21 Blue Area, Islamabad, Pakistan', '0308-2345678', 'faisal.latif@example.com', 13, 'Zeeshan Anwar', '0313-4344455', 'zeeshan.anwar@couriers.com', 13, 4.80, '30x22x14 cm', 'Pending', '2024-06-22', 13, '2024-06-22', '2024-06-24', 'Lahore Hub', 13, 1400.00, '2024-06-24'),

(14, 'Nida Farooq', '32 Allama Iqbal Town, Lahore, Pakistan', '0347-8765432', 'nida.farooq@example.com', 14, 'Shahid Khan', '0314-5455566', 'shahid.khan@couriers.com', 14, 6.25, '36x26x16 cm', 'In Transit', '2024-06-23', 14, '2024-06-23', '2024-06-25', 'Islamabad Hub', 14, 1650.00, '2024-06-25'),

(15, 'Ali Mustafa', '99 Saddar, Karachi, Pakistan', '0322-1234567', 'ali.mustafa@example.com', 15, 'Waqas Ali', '0315-6566677', 'waqas.ali@couriers.com', 15, 5.40, '33x23x13 cm', 'Delivered', '2024-06-24', 15, '2024-06-24', '2024-06-26', 'Karachi Hub', 15, 1550.00, '2024-06-26'),

(16, 'Nazia Ahmed', '44 Bahria Town, Lahore, Pakistan', '0307-3456789', 'nazia.ahmed@example.com', 16, 'Rizwan Iqbal', '0316-7677788', 'rizwan.iqbal@couriers.com', 16, 3.60, '27x17x12 cm', 'In Transit', '2024-06-25', 16, '2024-06-25', '2024-06-27', 'Lahore Hub', 16, 1250.00, '2024-06-27'),

(17, 'Waseem Javed', '18 Korangi, Karachi, Pakistan', '0315-9876543', 'waseem.javed@example.com', 17, 'Noman Javed', '0317-8788899', 'noman.javed@couriers.com', 17, 4.20, '28x18x13 cm', 'Pending', '2024-06-26', 17, '2024-06-26', '2024-06-28', 'Islamabad Hub', 17, 1350.00, '2024-06-28'),

(18, 'Zainab Bibi', '3 F-10/4, Islamabad, Pakistan', '0309-2345678', 'zainab.bibi@example.com', 18, 'Mubashir Ali', '0318-9899000', 'mubashir.ali@couriers.com', 18, 6.10, '35x25x15 cm', 'In Transit', '2024-06-27', 18, '2024-06-27', '2024-06-29', 'Karachi Hub', 18, 1600.00, '2024-06-29'),

(19, 'Asad Khan', '29 G-7/2, Islamabad, Pakistan', '0348-8765432', 'asad.khan@example.com', 19, 'Kashif Ahmed', '0319-0900123', 'kashif.ahmed@couriers.com', 19, 5.30, '32x22x14 cm', 'Delivered', '2024-06-28', 19, '2024-06-28', '2024-06-30', 'Lahore Hub', 19, 1450.00, '2024-06-30'),

(20, 'Lubna Hussain', '76 Gulberg, Lahore, Pakistan', '0324-1234567', 'lubna.hussain@example.com', 20, 'Usman Siddiqui', '0320-1011223', 'usman.siddiqui@couriers.com', 20, 7.40, '40x30x20 cm', 'In Transit', '2024-06-29', 20, '2024-06-29', '2024-07-01', 'Islamabad Hub', 20, 1750.00, '2024-07-01');

CREATION OF CUSTOMERS TABLE

```
CREATE TABLE Customers (  
    customer_id INT AUTO_INCREMENT PRIMARY KEY,  
    customer_name VARCHAR(255) NOT NULL,  
    customer_address TEXT NOT NULL,  
    customer_phone VARCHAR(20),  
    customer_email VARCHAR(255)  
);
```

DATA INSERTION IN CUSTOMERS TABLE

```
INSERT INTO Customers (customer_name, customer_address, customer_phone, customer_email)  
VALUES  
  
('Ahmed Khan', '123 Main Street, Karachi, Pakistan', '0312-3456789', 'ahmed.khan@example.com'),  
('Fatima Ali', '456 Garden Town, Lahore, Pakistan', '0333-9876543', 'fatima.ali@example.com'),  
('Usman Iqbal', '789 Clifton, Karachi, Pakistan', '0301-2345678', 'usman.iqbal@example.com'),  
('Sara Malik', '101 G-11/3, Islamabad, Pakistan', '0345-8765432', 'sara.malik@example.com'),  
('Ayesha Noor', '202 Model Town, Lahore, Pakistan', '0321-1234567', 'ayesha.noor@example.com'),  
('Bilal Zafar', '11 Iqbal Town, Faisalabad, Pakistan', '0302-3456789', 'bilal.zafar@example.com'),  
('Hina Tariq', '88 DHA Phase 6, Lahore, Pakistan', '0331-9876543', 'hina.tariq@example.com'),  
('Raza Qureshi', '14 Gulshan-e-Iqbal, Karachi, Pakistan', '0305-2345678', 'raza.qureshi@example.com'),  
('Mariam Shah', '9 F-8/3, Islamabad, Pakistan', '0346-8765432', 'mariam.shah@example.com'),  
('Kamran Ahmed', '56 Satellite Town, Rawalpindi, Pakistan', '0323-1234567',  
'kamran.ahmed@example.com'),  
('Sana Riaz', '112 Johar Town, Lahore, Pakistan', '0306-3456789', 'sana.riaz@example.com'),  
('Tariq Hassan', '7 North Nazimabad, Karachi, Pakistan', '0314-9876543', 'tariq.hassan@example.com'),  
('Faisal Latif', '21 Blue Area, Islamabad, Pakistan', '0308-2345678', 'faisal.latif@example.com'),  
('Nida Farooq', '32 Allama Iqbal Town, Lahore, Pakistan', '0347-8765432', 'nida.farooq@example.com'),
```


('Ali Mustafa', '99 Saddar, Karachi, Pakistan', '0322-1234567', 'ali.mustafa@example.com'),
('Nazia Ahmed', '44 Bahria Town, Lahore, Pakistan', '0307-3456789', 'nazia.ahmed@example.com'),
('Waseem Javed', '18 Korangi, Karachi, Pakistan', '0315-9876543', 'waseem.javed@example.com'),
('Zainab Bibi', '3 F-10/4, Islamabad, Pakistan', '0309-2345678', 'zainab.bibi@example.com'),
('Asad Khan', '29 G-7/2, Islamabad, Pakistan', '0348-8765432', 'asad.khan@example.com'),
('Lubna Hussain', '76 Gulberg, Lahore, Pakistan', '0324-1234567', 'lubna.hussain@example.com');

CREATION OF COURIER TABLE

```
CREATE TABLE Courier (  
    courier_id INT AUTO_INCREMENT PRIMARY KEY,  
    courier_name VARCHAR(255) NOT NULL,  
    courier_contact_number VARCHAR(20),  
    courier_email VARCHAR(255)  
);
```

DATA INSERTION IN COURIER TABLE

```
INSERT INTO Courier (courier_name, courier_contact_number, courier_email) VALUES  
('Ali Raza', '0301-1122334', 'ali.raza@couriers.com'),  
('Sanaullah Khan', '0302-2233445', 'sanaullah.khan@couriers.com'),  
('Rehan Shah', '0303-3344556', 'rehan.shah@couriers.com'),  
('Amir Khan', '0304-4455667', 'amir.khan@couriers.com'),  
('Bilal Ahmed', '0305-5566778', 'bilal.ahmed@couriers.com'),  
('Farooq Malik', '0306-6677889', 'farooq.malik@couriers.com'),  
('Kamran Sheikh', '0307-7788990', 'kamran.sheikh@couriers.com'),  
('Nadeem Raza', '0308-8899001', 'nadeem.raza@couriers.com'),  
('Saad Tariq', '0309-9900112', 'saad.tariq@couriers.com'),  
('Jamil Akhtar', '0310-1011122', 'jamil.akhtar@couriers.com'),  
('Irfan Haider', '0311-2122233', 'irfan.haider@couriers.com'),
```

('Yasir Qureshi', '0312-3233344', 'yasir.qureshi@couriers.com'),
('Zeeshan Anwar', '0313-4344455', 'zeeshan.anwar@couriers.com'),
('Shahid Khan', '0314-5455566', 'shahid.khan@couriers.com'),
('Waqas Ali', '0315-6566677', 'waqas.ali@couriers.com'),
('Rizwan Iqbal', '0316-7677788', 'rizwan.iqbal@couriers.com'),
('Noman Javed', '0317-8788899', 'noman.javed@couriers.com'),
('Mubashir Ali', '0318-9899000', 'mubashir.ali@couriers.com'),
('Kashif Ahmed', '0319-0900123', 'kashif.ahmed@couriers.com'),
('Usman Siddiqui', '0320-1011223', 'usman.siddiqui@couriers.com');

CREATION OF PACKAGES TABLE

```
CREATE TABLE Packages (  
    package_id INT AUTO_INCREMENT PRIMARY KEY,  
    customer_id INT,  
    package_weight DECIMAL(10, 2),  
    package_dimensions VARCHAR(100),  
    package_status VARCHAR(50),  
    package_date_sent DATE,  
    FOREIGN KEY (customer_id) REFERENCES Customers(customer_id)  
);
```

DATA INSERTION IN PACKAGES TABLE

```
INSERT INTO Packages (customer_id, package_weight, package_dimensions, package_status,  
package_date_sent) VALUES  
  
(1, 5.75, '30x20x15 cm', 'In Transit', '2024-06-10'),  
(2, 3.50, '25x15x10 cm', 'Delivered', '2024-06-11'),  
(3, 7.20, '40x30x20 cm', 'In Transit', '2024-06-12'),  
(4, 2.80, '20x15x10 cm', 'Pending', '2024-06-13'),  
(5, 6.00, '35x25x15 cm', 'In Transit', '2024-06-14'),
```

(6, 4.25, '28x18x12 cm', 'In Transit', '2024-06-15'),
(7, 3.75, '26x16x11 cm', 'Delivered', '2024-06-16'),
(8, 6.50, '38x28x18 cm', 'In Transit', '2024-06-17'),
(9, 2.90, '22x17x12 cm', 'Pending', '2024-06-18'),
(10, 5.50, '34x24x14 cm', 'In Transit', '2024-06-19'),
(11, 3.10, '24x14x11 cm', 'Delivered', '2024-06-20'),
(12, 7.60, '45x35x25 cm', 'In Transit', '2024-06-21'),
(13, 4.80, '30x22x14 cm', 'Pending', '2024-06-22'),
(14, 6.25, '36x26x16 cm', 'In Transit', '2024-06-23'),
(15, 5.40, '33x23x13 cm', 'Delivered', '2024-06-24'),
(16, 3.60, '27x17x12 cm', 'In Transit', '2024-06-25'),
(17, 4.20, '28x18x13 cm', 'Pending', '2024-06-26'),
(18, 6.10, '35x25x15 cm', 'In Transit', '2024-06-27'),
(19, 5.30, '32x22x14 cm', 'Delivered', '2024-06-28'),
(20, 7.40, '40x30x20 cm', 'In Transit', '2024-06-29');

CREATION OF SHIPMENTS TABLE

```
CREATE TABLE Shipments (  
    shipment_id INT AUTO_INCREMENT PRIMARY KEY,  
    package_id INT,  
    personnel_id INT,  
    shipment_date DATE,  
    shipment_delivery_date DATE,  
    shipment_current_location VARCHAR(255),  
    FOREIGN KEY (package_id) REFERENCES Packages(package_id),  
    FOREIGN KEY (personnel_id) REFERENCES Courier(courier_id)  
);
```

DATA INSERTION IN SHIPMENTS TABLE

INSERT INTO Shipments (package_id, personnel_id, shipment_date, shipment_delivery_date, shipment_current_location) VALUES

(1, 1, '2024-06-10', '2024-06-12', 'Karachi Hub'),
(2, 2, '2024-06-11', '2024-06-13', 'Lahore Hub'),
(3, 3, '2024-06-12', '2024-06-14', 'Islamabad Hub'),
(4, 4, '2024-06-13', '2024-06-15', 'Karachi Hub'),
(5, 5, '2024-06-14', '2024-06-16', 'Lahore Hub'),
(6, 6, '2024-06-15', '2024-06-17', 'Karachi Hub'),
(7, 7, '2024-06-16', '2024-06-18', 'Lahore Hub'),
(8, 8, '2024-06-17', '2024-06-19', 'Islamabad Hub'),
(9, 9, '2024-06-18', '2024-06-20', 'Karachi Hub'),
(10, 10, '2024-06-19', '2024-06-21', 'Lahore Hub'),
(11, 11, '2024-06-20', '2024-06-22', 'Islamabad Hub'),
(12, 12, '2024-06-21', '2024-06-23', 'Karachi Hub'),
(13, 13, '2024-06-22', '2024-06-24', 'Lahore Hub'),
(14, 14, '2024-06-23', '2024-06-25', 'Islamabad Hub'),
(15, 15, '2024-06-24', '2024-06-26', 'Karachi Hub'),
(16, 16, '2024-06-25', '2024-06-27', 'Lahore Hub'),
(17, 17, '2024-06-26', '2024-06-28', 'Islamabad Hub'),
(18, 18, '2024-06-27', '2024-06-29', 'Karachi Hub'),
(19, 19, '2024-06-28', '2024-06-30', 'Lahore Hub'),
(20, 20, '2024-06-29', '2024-07-01', 'Islamabad Hub');

CREATION OF FINANCE TABLE

CREATE TABLE Finance (

transaction_id INT AUTO_INCREMENT PRIMARY KEY,
shipment_id INT,

```
transaction_amount DECIMAL(10, 2),  
transaction_date DATE,  
FOREIGN KEY (shipment_id) REFERENCES Shipments(shipment_id)  
);
```

DATA INSERTION IN FINANCE TABLE

```
INSERT INTO Finance (shipment_id, transaction_amount, transaction_date) VALUES  
(1, 1500.00, '2024-06-12'),  
(2, 1200.00, '2024-06-13'),  
(3, 1800.00, '2024-06-14'),  
(4, 900.00, '2024-06-15'),  
(5, 1600.00, '2024-06-16'),  
(6, 1300.00, '2024-06-17'),  
(7, 1100.00, '2024-06-18'),  
(8, 1700.00, '2024-06-19'),  
(9, 950.00, '2024-06-20'),  
(10, 1500.00, '2024-06-21'),  
(11, 1150.00, '2024-06-22'),  
(12, 1850.00, '2024-06-23'),  
(13, 1400.00, '2024-06-24'),  
(14, 1650.00, '2024-06-25'),  
(15, 1550.00, '2024-06-26'),  
(16, 1250.00, '2024-06-27'),  
(17, 1350.00, '2024-06-28'),  
(18, 1600.00, '2024-06-29'),  
(19, 1450.00, '2024-06-30'),  
(20, 1750.00, '2024-07-01');
```

7- Screenshots of table with records.

CUSTOMERS TABLE

	customer_id	customer_name	customer_address	customer_phone	customer_email
▶	1	Ahmed Khan	123 Main Street, Karachi, Pakistan	0312-3456789	ahmed.khan@example.com
	2	Fatima Ali	456 Garden Town, Lahore, Pakistan	0333-9876543	fatima.ali@example.com
	3	Usman Iqbal	789 Clifton, Karachi, Pakistan	0301-2345678	usman.iqbal@example.com
	4	Sara Malik	101 G-11/3, Islamabad, Pakistan	0345-8765432	sara.malik@example.com
	5	Ayesha Noor	202 Model Town, Lahore, Pakistan	0321-1234567	ayesha.noor@example.com
	6	Bilal Zafar	11 Iqbal Town, Faisalabad, Pakistan	0302-3456789	bilal.zafar@example.com
	7	Hina Tariq	88 DHA Phase 6, Lahore, Pakistan	0331-9876543	hina.tariq@example.com
	8	Raza Qureshi	14 Gulshan-e-Iqbal, Karachi, Pakistan	0305-2345678	raza.qureshi@example.com
	9	Mariam Shah	9 F-8/3, Islamabad, Pakistan	0346-8765432	mariam.shah@example.com
	10	Kamran Ahmed	56 Satellite Town, Rawalpindi, Pakistan	0323-1234567	kamran.ahmed@example.com
	11	Sana Riaz	112 Johar Town, Lahore, Pakistan	0306-3456789	sana.riaz@example.com
	12	Tariq Hassan	7 North Nazimabad, Karachi, Pakistan	0314-9876543	tariq.hassan@example.com
	13	Faisal Latif	21 Blue Area, Islamabad, Pakistan	0308-2345678	faisal.latif@example.com
	14	Nida Farooq	32 Allama Iqbal Town, Lahore, Pakistan	0347-8765432	nida.farooq@example.com
	15	Ali Mustafa	99 Saddar, Karachi, Pakistan	0322-1234567	ali.mustafa@example.com
	16	Nazia Ahmed	44 Bahria Town, Lahore, Pakistan	0307-3456789	nazia.ahmed@example.com
	17	Waseem Javed	18 Korangi, Karachi, Pakistan	0315-9876543	waseem.javed@example.com
Customers 2 v					
	17	Waseem Javed	18 Korangi, Karachi, Pakistan	0315-9876543	waseem.javed@example.com
	18	Zainab Bibi	3 F-10/4, Islamabad, Pakistan	0309-2345678	zainab.bibi@example.com
	19	Asad Khan	29 G-7/2, Islamabad, Pakistan	0348-8765432	asad.khan@example.com
	20	Lubna Hussain	76 Gulberg, Lahore, Pakistan	0324-1234567	lubna.hussain@example.com
✱	NULL	NULL	NULL	NULL	NULL

COURIER TABLE

	courier_id	courier_name	courier_contact_number	courier_email		
▶	1	Ali Raza	0301-1122334	ali.raza@couriers.com		
	2	Sanaullah Khan	0302-2233445	sanaullah.khan@couriers.com		
	3	Rehan Shah	0303-3344556	rehan.shah@couriers.com		
	4	Amir Khan	0304-4455667	amir.khan@couriers.com		
	5	Bilal Ahmed	0305-5566778	bilal.ahmed@couriers.com		
	6	Farooq Malik	0306-6677889	farooq.malik@couriers.com		
	7	Kamran Sheikh	0307-7788990	kamran.sheikh@couriers.com		
	8	Nadeem Raza	0308-8899001	nadeem.raza@couriers.com		
	9	Saad Tariq	0309-9900112	saad.tariq@couriers.com		
	10	Jamil Akhtar	0310-1011122	jamil.akhtar@couriers.com		
	11	Irfan Haider	0311-2122233	irfan.haider@couriers.com		
	12	Yasir Qureshi	0312-3233344	yasir.qureshi@couriers.com		
	13	Zeeshan Anwar	0313-4344455	zeeshan.anwar@couriers.com		
	14	Shahid Khan	0314-5455566	shahid.khan@couriers.com		
	15	Waqas Ali	0315-6566677	waqas.ali@couriers.com		
	16	Rizwan Iqbal	0316-7677788	rizwan.iqbal@couriers.com		
	17	Noman Javed	0317-8788899	noman.javed@couriers.com		
Courier 4 ×						
	18	18	6.10	35x25x15 cm	In Transit	2024-06-27
	19	19	5.30	32x22x14 cm	Delivered	2024-06-28
	20	20	7.40	40x30x20 cm	In Transit	2024-06-29
★	NULL	NULL	NULL	NULL	NULL	NULL

PACKAGES TABLE

	package_id	customer_id	package_weight	package_dimensions	package_status	package_date_sent
▶	1	1	5.75	30x20x15 cm	In Transit	2024-06-10
	2	2	3.50	25x15x10 cm	Delivered	2024-06-11
	3	3	7.20	40x30x20 cm	In Transit	2024-06-12
	4	4	2.80	20x15x10 cm	Pending	2024-06-13
	5	5	6.00	35x25x15 cm	In Transit	2024-06-14
	6	6	4.25	28x18x12 cm	In Transit	2024-06-15
	7	7	3.75	26x16x11 cm	Delivered	2024-06-16
	8	8	6.50	38x28x18 cm	In Transit	2024-06-17
	9	9	2.90	22x17x12 cm	Pending	2024-06-18
	10	10	5.50	34x24x14 cm	In Transit	2024-06-19
	11	11	3.10	24x14x11 cm	Delivered	2024-06-20
	12	12	7.60	45x35x25 cm	In Transit	2024-06-21
	13	13	4.80	30x22x14 cm	Pending	2024-06-22
	14	14	6.25	36x26x16 cm	In Transit	2024-06-23
	15	15	5.40	33x23x13 cm	Delivered	2024-06-24
	16	16	3.60	27x17x12 cm	In Transit	2024-06-25
	17	17	4.20	28x18x13 cm	Pending	2024-06-26
Package 5 ...						
	18	18	6.10	35x25x15 cm	In Transit	2024-06-27
	19	19	5.30	32x22x14 cm	Delivered	2024-06-28
	20	20	7.40	40x30x20 cm	In Transit	2024-06-29
•	NULL	NULL	NULL	NULL	NULL	NULL

SHIPMENTS TABLE

	shipment_id	package_id	personnel_id	shipment_date	shipment_delivery_date	shipment_current_location
▶	1	1	1	2024-06-10	2024-06-12	Karachi Hub
	2	2	2	2024-06-11	2024-06-13	Lahore Hub
	3	3	3	2024-06-12	2024-06-14	Islamabad Hub
	4	4	4	2024-06-13	2024-06-15	Karachi Hub
	5	5	5	2024-06-14	2024-06-16	Lahore Hub
	6	6	6	2024-06-15	2024-06-17	Karachi Hub
	7	7	7	2024-06-16	2024-06-18	Lahore Hub
	8	8	8	2024-06-17	2024-06-19	Islamabad Hub
	9	9	9	2024-06-18	2024-06-20	Karachi Hub
	10	10	10	2024-06-19	2024-06-21	Lahore Hub
	11	11	11	2024-06-20	2024-06-22	Islamabad Hub
	12	12	12	2024-06-21	2024-06-23	Karachi Hub
	13	13	13	2024-06-22	2024-06-24	Lahore Hub
	14	14	14	2024-06-23	2024-06-25	Islamabad Hub
	15	15	15	2024-06-24	2024-06-26	Karachi Hub
	16	16	16	2024-06-25	2024-06-27	Lahore Hub
	17	17	17	2024-06-26	2024-06-28	Islamabad Hub

Shipments 6 ×

	18	18	18	2024-06-27	2024-06-29	Karachi Hub
	19	19	19	2024-06-28	2024-06-30	Lahore Hub
	20	20	20	2024-06-29	2024-07-01	Islamabad Hub
•	NULL	NULL	NULL	NULL	NULL	NULL

Shipments 6 ×

FINANCE TABLE

	transaction_id	shipment_id	transaction_amount	transaction_date
▶	1	1	1500.00	2024-06-12
	2	2	1200.00	2024-06-13
	3	3	1800.00	2024-06-14
	4	4	900.00	2024-06-15
	5	5	1600.00	2024-06-16
	6	6	1300.00	2024-06-17
	7	7	1100.00	2024-06-18
	8	8	1700.00	2024-06-19
	9	9	950.00	2024-06-20
	10	10	1500.00	2024-06-21
	11	11	1150.00	2024-06-22
	12	12	1850.00	2024-06-23
	13	13	1400.00	2024-06-24
	14	14	1650.00	2024-06-25
	15	15	1550.00	2024-06-26
	16	16	1250.00	2024-06-27
	17	17	1350.00	2024-06-28

Finance 7

	18	18	1600.00	2024-06-29
	19	19	1450.00	2024-06-30
	20	20	1750.00	2024-07-01
•	NULL	NULL	NULL	NULL

Finance 7 ×

8- Normalized tables

CREATION OF NORMALIZED CUSTOMERS TABLE

-- Create Customers table

```
CREATE TABLE Customers (  
    customer_id INT AUTO_INCREMENT PRIMARY KEY,  
    customer_name VARCHAR(255) NOT NULL,  
    customer_address TEXT NOT NULL,  
    customer_phone VARCHAR(20),  
    customer_email VARCHAR(255)  
);
```

CREATION OF NORMALIZED COURIER TABLE

-- Create Courier table

```
CREATE TABLE Courier (  
    courier_id INT AUTO_INCREMENT PRIMARY KEY,  
    courier_name VARCHAR(255) NOT NULL,  
    courier_contact_number VARCHAR(20),  
    courier_email VARCHAR(255)  
);
```

CREATION OF NORMALIZED PACKAGES TABLE

-- Create Packages table

```
CREATE TABLE Packages (  
    package_id INT AUTO_INCREMENT PRIMARY KEY,  
    customer_id INT,
```

```
package_weight DECIMAL(10, 2),
package_dimensions VARCHAR(100),
package_status VARCHAR(50),
package_date_sent DATE,
FOREIGN KEY (customer_id) REFERENCES Customers(customer_id)
);
```

CREATION OF NORMALIZED SHIPMENTS TABLE

-- Create Shipments table

```
CREATE TABLE Shipments (
    shipment_id INT AUTO_INCREMENT PRIMARY KEY,
    package_id INT,
    personnel_id INT,
    shipment_date DATE,
    shipment_delivery_date DATE,
    shipment_current_location VARCHAR(255),
    FOREIGN KEY (package_id) REFERENCES Packages(package_id),
    FOREIGN KEY (personnel_id) REFERENCES Courier(courier_id)
);
```

CREATION OF NORMALIZED FINANCE TABLE

-- Create Finance table

```
CREATE TABLE Finance (
    transaction_id INT AUTO_INCREMENT PRIMARY KEY,
    shipment_id INT,
    transaction_amount DECIMAL(10, 2),
```

```

transaction_date DATE,

FOREIGN KEY (shipment_id) REFERENCES Shipments(shipment_id)

);

```

STRUCTURE OF NORMALIZED CUSTOMERS TABLE

	Field	Type	Null	Key	Default	Extra
►	customer_id	int	NO	PRI	NULL	auto_increment
	customer_name	varchar(255)	NO		NULL	
	customer_address	text	NO		NULL	
	customer_phone	varchar(20)	YES		NULL	
	customer_email	varchar(255)	YES		NULL	

STRUCTURE OF NORMALIZED COURIER TABLE

	Field	Type	Null	Key	Default	Extra
►	courier_id	int	NO	PRI	NULL	auto_increment
	courier_name	varchar(255)	NO		NULL	
	courier_contact_number	varchar(20)	YES		NULL	
	courier_email	varchar(255)	YES		NULL	

STRUCTURE OF NORMALIZED PACKAGES TABLE

	Field	Type	Null	Key	Default	Extra
►	package_id	int	NO	PRI	NULL	auto_increment
	customer_id	int	YES	MUL	NULL	
	package_weight	decimal(10,2)	YES		NULL	
	package_dimensions	varchar(100)	YES		NULL	
	package_status	varchar(50)	YES		NULL	
	package_date_sent	date	YES		NULL	

STRUCTURE OF NORMALIZED SHIPMENTS TABLE

	Field	Type	Null	Key	Default	Extra
►	shipment_id	int	NO	PRI	NULL	auto_increment
	package_id	int	YES	MUL	NULL	
	personnel_id	int	YES	MUL	NULL	
	shipment_date	date	YES		NULL	
	shipment_delivery_date	date	YES		NULL	
	shipment_current_location	varchar(255)	YES		NULL	

STRUCTURE OF NORMALIZED FINANCE TABLE

	Field	Type	Null	Key	Default	Extra
►	transaction_id	int	NO	PRI	NULL	auto_increment
	shipment_id	int	YES	MUL	NULL	
	transaction_amount	decimal(10,2)	YES		NULL	
	transaction_date	date	YES		NULL	

9- Data Dictionary

CUSTOMER TABLE

COULMN NAME	DATA TYPE	CONSTRAINTS	DESCRIPTION
customer_id	INT	AUTO_INCREMENT, PRIMARY KEY	Unique identifier for each customer
Customer_name	VARCHAR(255)	NOT NULL	Name of the customer
Customer_address	TEXT	NOTNULL	Address of the customer
customer_phone	VARCHAR(20)		Phone number of the customer
customer_email	VARCHAR(255)		Email address of the customer

COURIER TABLE

Column Name	Data Type	Constraints	Description
courier_id	INT	AUTO_INCREMENT, PRIMARY KEY	Unique identifier for each courier
courier_name	VARCHAR(255)	NOT NULL	Name of the courier man
courier_contact_number	VARCHAR(20)		Contact number of the courier
courier_email	VARCHAR(255)		Email address of the courier

PACKAGES TABLE

Column Name	Data Type	Constraints	Description
package_id	INT	AUTO_INCREMENT, PRIMARY KEY	Unique identifier for each package
customer_id	INT DECIMAL(10, 2)	FOREIGN KEY REFERENCES Customers(customer_id)	Customer ID associated with the package

package_dimensions	VARCHAR(100)		Dimensions of the package
package_status	VARCHAR(50)		Status of the package
package_date_sent	DATE		Date the package was sent
package_weight	DECIMAL(10, 2)		Weight of the package

SHIPMENT TABLE

Column Name	Data Type	Constraints	Description
shipment_id	INT	AUTO_INCREMENT, PRIMARY KEY	Unique identifier for each shipment
package_id	INT	FOREIGN KEY REFERENCES Packages(package_id)	Package ID associated with the shipment
personnel_id	INT	FOREIGN KEY REFERENCES Courier(courier_id)	Courier ID handling the shipment
shipment_date	DATE		Date the shipment was made
shipment_delivery_date	DATE		Date the shipment was delivered
shipment_current_location	VARCHAR(255)		Current location of the shipment

FINANCE TABLE

Column Name	Data Type	Constraints	Description
transaction_id	INT	AUTO_INCREMENT, PRIMARY KEY	Unique identifier for each transaction
shipment_id	INT	FOREIGN KEY REFERENCES Shipments(shipment_id)	Shipment ID associated with the transaction
transaction_amount	DECIMAL(10, 2)		Amount of the transaction
transaction_date	DATE		Date of the transaction

10- Reporting Queries with code and screenshots

1. Create Indexes for Optimization

```
221 • CREATE INDEX idx_customer_id ON Customers(customer_id);
222 • CREATE INDEX idx_courier_id ON Courier(courier_id);
223 • CREATE INDEX idx_package_id ON Packages(package_id);
224 • CREATE INDEX idx_shipment_id ON Shipments(shipment_id);
225 • CREATE INDEX idx_transaction_id ON Finance(transaction_id);
226 • SHOW INDEX FROM Customers;
227 • SHOW INDEX FROM Courier;
228 • SHOW INDEX FROM Packages;
229 • SHOW INDEX FROM Shipments;
230 • SHOW INDEX FROM Finance;
```

Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
customers	0	PRIMARY	1	customer_id	A	20	HULL	HULL		BTREE			YES	HULL
customers	1	idx_customer_id	1	customer_id	A	20	HULL	HULL		BTREE			YES	HULL

Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
courier	0	PRIMARY	1	courier_id	A	20	HULL	HULL		BTREE			YES	HULL
courier	1	idx_courier_id	1	courier_id	A	20	HULL	HULL		BTREE			YES	HULL

Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
packages	0	PRIMARY	1	package_id	A	20	HULL	HULL		BTREE			YES	HULL
packages	1	customer_id	1	customer_id	A	20	HULL	HULL	YES	BTREE			YES	HULL
packages	1	idx_package_id	1	package_id	A	20	HULL	HULL		BTREE			YES	HULL

Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
shipments	0	PRIMARY	1	shipment_id	A	20	HULL	HULL		BTREE			YES	HULL
shipments	1	package_id	1	package_id	A	20	HULL	HULL	YES	BTREE			YES	HULL
shipments	1	personnel_id	1	personnel_id	A	20	HULL	HULL	YES	BTREE			YES	HULL
shipments	1	idx_shipment_id	1	shipment_id	A	20	HULL	HULL		BTREE			YES	HULL

Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
finance	0	PRIMARY	1	transaction_id	A	20	HULL	HULL		BTREE			YES	HULL
finance	1	shipment_id	1	shipment_id	A	20	HULL	HULL	YES	BTREE			YES	HULL
finance	1	idx_transaction_id	1	transaction_id	A	20	HULL	HULL		BTREE			YES	HULL

2. Trigger: Trigger to Update Package Status on Delivery

```
358 DELIMITER //
359 • CREATE TRIGGER UpdatePackageStatusOnDelivery
360 AFTER UPDATE ON Shipments
361 FOR EACH ROW
362 BEGIN
363     IF NEW.shipment_delivery_date IS NOT NULL THEN
364         UPDATE Packages
365         SET package_status = 'Delivered'
366         WHERE package_id = NEW.package_id;
367     END IF;
368 END //
369 DELIMITER ;
370 • UPDATE Shipments
371 SET shipment_delivery_date = '2024-06-12'
372 WHERE shipment_id = 1;
373 • SELECT * FROM Packages WHERE package_id = 1;
374
375
```

SAMPLE OUTPUT

	package_id	customer_id	package_weight	package_dimensions	package_status	package_date_sent
▶	1	1	5.75	30x20x15 cm	Delivered	2024-06-10
*	NULL	NULL	NULL	NULL	NULL	NULL

Packages 32 x

3. Stored Procedure: GetCustomerTransactionAmount

This procedure calculates the total transaction amount for a given customer.

```
233 DELIMITER //
234 • CREATE PROCEDURE GetCustomerTransactionAmount(IN customerId INT)
235   BEGIN
236     SELECT
237       c.customer_name,
238       SUM(f.transaction_amount) AS total_transaction_amount
239     FROM
240       Customers c
241     JOIN
242       Packages p ON c.customer_id = p.customer_id
243     JOIN
244       Shipments s ON p.package_id = s.package_id
245     JOIN
246       Finance f ON s.shipment_id = f.shipment_id
247     WHERE
248       c.customer_id = customerId
249     GROUP BY
250       c.customer_name;
251   END //
252 DELIMITER ;
253 • -- Call the stored procedure
254 CALL GetCustomerTransactionAmount(1);
```

SAMPLE OUTPUT


	customer_name	total_transaction_amount
►	Ahmed Khan	1500.00

4. View: MonthlyShipmentSummary.

This view provides a summary of shipments and revenue for each month.

```
256 • CREATE VIEW MonthlyShipmentSummary AS
257     SELECT
258         YEAR(s.shipment_date) AS year,
259         MONTH(s.shipment_date) AS month,
260         COUNT(s.shipment_id) AS total_shipments,
261         SUM(f.transaction_amount) AS total_revenue
262     FROM
263         Shipments s
264     JOIN
265         Finance f ON s.shipment_id = f.shipment_id
266     GROUP BY
267         YEAR(s.shipment_date), MONTH(s.shipment_date);
268 • SELECT * FROM MonthlyShipmentSummary;
269
```

SAMPLE OUTPUT

Result Grid		 Filter Rows: <input type="text"/>		Export
	year	month	total_shipments	total_revenue
▶	2024	6	20	28550.00

MonthlyShipmentSummary 24 ×

5. Join: Shipment and Package Details

This query retrieves detailed information about shipments, packages, customers, and couriers.

```
286
287 •   SELECT
288       s.shipment_id,
289       s.shipment_date,
290       s.shipment_delivery_date,
291       s.shipment_current_location,
292       p.package_id,
293       p.package_status,
294       c.customer_name,
295       cr.courier_name
296 FROM
297     Shipments s
298 JOIN
299     Packages p ON s.package_id = p.package_id
300 JOIN
301     Customers c ON p.customer_id = c.customer_id
302 JOIN
303     Courier cr ON s.personnel_id = cr.courier_id;
---
```


SAMPLE OUTPUT

	shipment_id	shipment_date	shipment_delivery_date	shipment_current_location	package_id	package_status	customer_name	courier_name
	1	2024-06-10	2024-06-12	Karachi Hub	1	In Transit	Ahmed Khan	Ali Raza
	2	2024-06-11	2024-06-13	Lahore Hub	2	Delivered	Fatima Ali	Sanaullah Khan
	3	2024-06-12	2024-06-14	Islamabad Hub	3	In Transit	Usman Iqbal	Rehan Shah
	4	2024-06-13	2024-06-15	Karachi Hub	4	Pending	Sara Malik	Amir Khan
	5	2024-06-14	2024-06-16	Lahore Hub	5	In Transit	Ayesha Noor	Bilal Ahmed
	6	2024-06-15	2024-06-17	Karachi Hub	6	In Transit	Bilal Zafar	Farooq Malik
	7	2024-06-16	2024-06-18	Lahore Hub	7	Delivered	Hina Tariq	Kamran Sheikh
	8	2024-06-17	2024-06-19	Islamabad Hub	8	In Transit	Raza Qureshi	Nadeem Raza
	9	2024-06-18	2024-06-20	Karachi Hub	9	Pending	Mariam Shah	Saad Tariq
	10	2024-06-19	2024-06-21	Lahore Hub	10	In Transit	Kamran Ahmed	Jamil Akhtar
▶	11	2024-06-20	2024-06-22	Islamabad Hub	11	Delivered	Sana Riaz	Irfan Haider
	12	2024-06-21	2024-06-23	Karachi Hub	12	In Transit	Tariq Hassan	Yasir Qureshi
	13	2024-06-22	2024-06-24	Lahore Hub	13	Pending	Faisal Latif	Zeeshan Anwar
	14	2024-06-23	2024-06-25	Islamabad Hub	14	In Transit	Nida Farooq	Shahid Khan
	15	2024-06-24	2024-06-26	Karachi Hub	15	Pending	Umar Khan	Muhammad Ali

Result 29

15	2024-06-24	2024-06-26	Karachi Hub	15	Delivered	Ali Mustafa	Waqas Ali
16	2024-06-25	2024-06-27	Lahore Hub	16	In Transit	Nazia Ahmed	Rizwan Iqbal
17	2024-06-26	2024-06-28	Islamabad Hub	17	Pending	Waseem Javed	Noman Javed
18	2024-06-27	2024-06-29	Karachi Hub	18	In Transit	Zainab Bibi	Mubashir Ali
19	2024-06-28	2024-06-30	Lahore Hub	19	Delivered	Asad Khan	Kashif Ahmed
20	2024-06-29	2024-07-01	Islamabad Hub	20	In Transit	Lubna Hussain	Usman Siddiqui

Result 29

6. View: To Get Revenue Billing Report

This query retrieves detailed information about the Revenue

```
306 • CREATE VIEW RevenueBillingReport AS SELECT
307     c.customer_id,
308     c.customer_name,
309     p.package_id,
310     p.package_weight,
311     p.package_dimensions,
312     f.transaction_amount,
313     f.transaction_date,
314     cr.courier_name,
315     s.shipment_date,
316     s.shipment_delivery_date
317 FROM
318     Customers c
319 JOIN
320     Packages p ON c.customer_id = p.customer_id
321 JOIN
322     Shipments s ON p.package_id = s.package_id
323 JOIN
324     Finance f ON s.shipment_id = f.shipment_id
325 JOIN
326     Courier cr ON s.personnel_id = cr.courier_id;
327 • SELECT * FROM RevenueBillingReport;
```

SAMPLE OUTPUT

	customer_id	customer_name	package_id	package_weight	package_dimensions	transaction_amount	transaction_date	courier_name	shipment_date	shipment_delivery_date
▶	1	Ahmed Khan	1	5.75	30x20x15 cm	1500.00	2024-06-12	Ali Raza	2024-06-10	2024-06-12
	2	Fatima Ali	2	3.50	25x15x10 cm	1200.00	2024-06-13	Sanaullah Khan	2024-06-11	2024-06-13
	3	Usman Iqbal	3	7.20	40x30x20 cm	1800.00	2024-06-14	Rehan Shah	2024-06-12	2024-06-14
	4	Sara Malik	4	2.80	20x15x10 cm	900.00	2024-06-15	Amir Khan	2024-06-13	2024-06-15
	5	Ayesha Noor	5	6.00	35x25x15 cm	1600.00	2024-06-16	Bilal Ahmed	2024-06-14	2024-06-16
	6	Bilal Zafar	6	4.25	28x18x12 cm	1300.00	2024-06-17	Farooq Malik	2024-06-15	2024-06-17
	7	Hina Tariq	7	3.75	26x16x11 cm	1100.00	2024-06-18	Kamran Sheikh	2024-06-16	2024-06-18
	8	Raza Qureshi	8	6.50	38x28x18 cm	1700.00	2024-06-19	Nadeem Raza	2024-06-17	2024-06-19
	9	Mariam Shah	9	2.90	22x17x12 cm	950.00	2024-06-20	Saad Tariq	2024-06-18	2024-06-20
	10	Kamran Ahmed	10	5.50	34x24x14 cm	1500.00	2024-06-21	Jamil Akhtar	2024-06-19	2024-06-21
	11	Sana Riaz	11	3.10	24x14x11 cm	1150.00	2024-06-22	Irfan Haider	2024-06-20	2024-06-22
	12	Tariq Hassan	12	7.60	45x35x25 cm	1850.00	2024-06-23	Yasir Qureshi	2024-06-21	2024-06-23
	13	Faisal Latif	13	4.80	30x22x14 cm	1400.00	2024-06-24	Zeeshan Anwar	2024-06-22	2024-06-24
	14	Nida Farooq	14	6.25	36x26x16 cm	1650.00	2024-06-25	Shahid Khan	2024-06-23	2024-06-25
	15	Ali Mustafa	15	5.40	33x23x13 cm	1550.00	2024-06-26	Waqas Ali	2024-06-24	2024-06-26
	16	Nazia Ahmed	16	3.60	27x17x12 cm	1250.00	2024-06-27	Rizwan Iqbal	2024-06-25	2024-06-27
	17	Waseem Javed	17	4.20	28x18x13 cm	1350.00	2024-06-28	Noman Javed	2024-06-26	2024-06-28
	18	Zainab Bibi	18	6.10	35x25x15 cm	1600.00	2024-06-29	Mubashir Ali	2024-06-27	2024-06-29
	19	Asad Khan	19	5.30	32x22x14 cm	1450.00	2024-06-30	Kashif Ahmed	2024-06-28	2024-06-30
	20	Lubna Hussain	20	7.40	40x30x20 cm	1750.00	2024-07-01	Usman Siddiqui	2024-06-29	2024-07-01

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11- Conclusion

The proposed Courier Management System offers a powerful database solution for efficiently managing courier services. By utilizing SQL features such as indexes, stored procedures, views, and triggers, the system ensures data integrity, fast information retrieval, and automated updates, effectively addressing the main challenges in courier management.