

# PROJECT ASSIGNMENT

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Roll no.-2022UGCS091

## Creating database and insertion.

```
CREATE DATABASE ShipMate;
```

```
USE ShipMate;
```

```
-- drop database ShipMate;
```

```
CREATE TABLE Customer (
```

```
    CustomerID VARCHAR(6) CHECK(CustomerID LIKE 'C%') PRIMARY KEY,
```

```
    Name VARCHAR(255) NOT NULL,
```

```
    street VARCHAR(20) NOT NULL,
```

```
    Address VARCHAR(100) NOT NULL,
```

```
    Phone VARCHAR(20) NOT NULL,
```

```
    Email VARCHAR(255) NOT NULL,
```

```
    BillingMethod VARCHAR(255) NOT NULL
```

```
);
```

```
CREATE TABLE Account (
```

```
    AccountID INT PRIMARY KEY,
```

```
    AccountNumber VARCHAR(20) NOT NULL,
```

```
    CustomerID VARCHAR(6) CHECK(CustomerID LIKE 'C%') NOT NULL ,
```

```
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID) on delete cascade
```

```
);
```

```
CREATE TABLE CreditCard (
```

```
    CardNumber BIGINT PRIMARY KEY,
```

```
    CustomerID VARCHAR(6) CHECK(CustomerID LIKE 'C%') NOT NULL,
```

```
    ExpirationDate DATE NOT NULL,
```

```
    SecurityCode INT NOT NULL,
```

```
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID) on delete cascade
```

```
);
```

```
CREATE TABLE Employee (  
    EmployeeID VARCHAR(6) CHECK(EmployeeID LIKE 'E%') PRIMARY KEY,  
    Name VARCHAR(255) NOT NULL,  
    Address VARCHAR(255) NOT NULL,  
    Phone VARCHAR(20) NOT NULL,  
    Email VARCHAR(255) NOT NULL,  
    Role VARCHAR(255) NOT NULL  
);
```

```
CREATE TABLE Warehouse (  
    WarehouseID VARCHAR(6) CHECK(WarehouseID LIKE 'W%') PRIMARY KEY,  
    Address VARCHAR(255) NOT NULL,  
    Phone VARCHAR(20) NOT NULL,  
    Email VARCHAR(255) NOT NULL  
);
```

```
CREATE TABLE Truck (  
    TruckID VARCHAR(6) CHECK(TruckID LIKE 'T%') PRIMARY KEY,  
    PlateNumber VARCHAR(20) NOT NULL,  
    Capacity DECIMAL(10,2) NOT NULL,  
    EmployeeID VARCHAR(6) ,  
    WarehouseID VARCHAR(6) ,  
    FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID) on delete set null ,  
    FOREIGN KEY (WarehouseID) REFERENCES Warehouse(WarehouseID) on delete set null  
);
```

```
CREATE TABLE Plane (  
    PlaneID VARCHAR(6) CHECK(PlaneID LIKE 'P%') PRIMARY KEY,  
    TailNumber VARCHAR(20) NOT NULL,
```

```
Capacity DECIMAL(10,2) NOT NULL,  
EmployeeID VARCHAR(6) ,  
WarehouseID VARCHAR(6) ,  
FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID) on delete set null,  
FOREIGN KEY (WarehouseID) REFERENCES Warehouse(WarehouseID) on delete set null  
);
```

```
CREATE TABLE Package (  
    PackageID VARCHAR(6) CHECK(PackageID LIKE 'P%'),  
    Type VARCHAR(255) NOT NULL,  
    Weight DECIMAL(10,2) NOT NULL,  
    DeliveryTime DATETIME NOT NULL,  
    Status VARCHAR(255) NOT NULL,  
    AccountID INT,  
    CreditCardNumber BIGINT,  
    EmployeeID VARCHAR(6) ,  
    TruckID VARCHAR(6) ,  
    PlaneID VARCHAR(6) ,  
    WarehouseID VARCHAR(6) ,  
    PRIMARY KEY(PackageID),  
    FOREIGN KEY (AccountID) REFERENCES Account(AccountID) on delete set null,  
    FOREIGN KEY (CreditCardNumber) REFERENCES CreditCard(CardNumber) on delete set null,  
    FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID) on delete set null,  
    FOREIGN KEY (TruckID) REFERENCES Truck(TruckID) on delete set null,  
    FOREIGN KEY (PlaneID) REFERENCES Plane(PlaneID) on delete set null,  
    FOREIGN KEY (WarehouseID) REFERENCES Warehouse(WarehouseID) on delete set null  
);
```

```
CREATE TABLE Orders (
```

```
PackageID VARCHAR(6) ,
SenderID VARCHAR(6) ,
ReceiverID VARCHAR(6),
ShippingDate DATETIME,
ShippingCost DECIMAL(10,2),
PromisedTime DATETIME,
FOREIGN KEY (SenderID) REFERENCES Customer(CustomerID) ,
FOREIGN KEY (ReceiverID) REFERENCES Customer(CustomerID),
FOREIGN KEY (PackageID) REFERENCES Package(PackageID) ,
PRIMARY KEY (PackageID, SenderID, ReceiverID)
);
```

```
CREATE TABLE loc_of_pkg (
    PackageID VARCHAR(6) CHECK(PackageID LIKE 'P%'),
    WarehouseID VARCHAR(6) CHECK(WarehouseID LIKE 'W%'),
    Start_timestamp DATETIME,
    End_timestamp DATETIME,
    FOREIGN KEY (PackageID) REFERENCES Package(PackageID) on delete cascade,
    FOREIGN KEY (WarehouseID) REFERENCES Warehouse(WarehouseID) on delete cascade,
    PRIMARY KEY (PackageID,WarehouseID)
);
```

```
CREATE TABLE Works (
    EmployeeID VARCHAR(6) ,
    TruckID VARCHAR(6) ,
    PlaneID VARCHAR(6) ,
    FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID) on delete cascade,
    FOREIGN KEY (TruckID) REFERENCES Truck(TruckID) on delete cascade,
    FOREIGN KEY (PlaneID) REFERENCES Plane(PlaneID) on delete cascade,
```

PRIMARY KEY (EmployeeID));

INSERT INTO Customer (CustomerID, Name, street, Address, Phone, Email, BillingMethod)

VALUES

('C101', 'John Smith', 'Main St', '123 Main St, Springfield, IL, USA', '555-1234',  
'johnsmith@example.com', 'Credit Card'),

('C102', 'Emily Johnson', 'Elm St', '456 Elm St, Chicago, IL, USA', '555-5678',  
'emilyjohnson@example.com', 'Invoice'),

('C103', 'Michael Williams', 'Oak St', '789 Oak St, New York, NY, USA', '555-9876',  
'michaelwilliams@example.com', 'Credit Card'),

('C104', 'Emma Jones', 'Maple St', '321 Maple St, Los Angeles, CA, USA', '555-4321',  
'emmajones@example.com', 'Invoice'),

('C105', 'Daniel Brown', 'Cedar St', '555 Cedar St, Miami, FL, USA', '555-1111',  
'danielbrown@example.com', 'Credit Card');

INSERT INTO Account (AccountID, AccountNumber, CustomerID)

VALUES

(201, 'A12345', 'C101'),

(202, 'B67890', 'C102'),

(203, 'C24680', 'C103'),

(204, 'D13579', 'C104'),

(205, 'E97531', 'C105');

INSERT INTO CreditCard (CardNumber, CustomerID, ExpirationDate, SecurityCode)

VALUES

('1234567890123456', 'C101', '2025-12-31', '123'),

('2345678901234567', 'C102', '2024-10-31', '456'),

('3456789012345678', 'C103', '2023-05-31', '789'),

('4567890123456789', 'C104', '2024-03-31', '321'),

('5678901234567890', 'C105', '2025-08-31', '654');

INSERT INTO Employee (EmployeeID, Name, Address, Phone, Email, Role)

VALUES

('E301', 'James Miller', '10 Business Blvd, Springfield, IL, USA', '555-1111', 'jamesmiller@example.com', 'Manager'),

('E302', 'Sophia Davis', '20 Service St, Chicago, IL, USA', '555-2222', 'sophiadavis@example.com', 'Driver'),

('E303', 'William Wilson', '30 Logistics Ln, New York, NY, USA', '555-3333', 'williamwilson@example.com', 'Warehouse Manager'),

('E304', 'Olivia Taylor', '40 Distribution Dr, Los Angeles, CA, USA', '555-4444', 'oliviataaylor@example.com', 'Clerk'),

('E305', 'Benjamin Anderson', '50 Delivery Rd, Miami, FL, USA', '555-5555', 'benjaminanderson@example.com', 'Driver');

INSERT INTO Warehouse (WarehouseID, Address, Phone, Email)

VALUES

('W401', '123 Main St, Springfield, IL, USA', '555-1234', 'warehouse1@example.com'),

('W402', '456 Elm St, Chicago, IL, USA', '555-5678', 'warehouse2@example.com'),

('W403', '789 Oak St, New York, NY, USA', '555-9876', 'warehouse3@example.com'),

('W404', '321 Maple St, Los Angeles, CA, USA', '555-4321', 'warehouse4@example.com'),

('W405', '555 Cedar St, Miami, FL, USA', '555-1111', 'warehouse5@example.com');

INSERT INTO Truck (TruckID, PlateNumber, Capacity, EmployeeID, WarehouseID)

VALUES

('T1721', 'ABC123', '5000.00', 'E301', 'W401'),

('T1722', 'XYZ789', '6000.00', 'E305', 'W405'),

('T1723', 'DEF456', '5500.00', 'E301', 'W402'),

('T1724', 'GHI789', '7000.00', 'E305', 'W404'),

('T1725', 'JKL012', '4500.00', 'E305', 'W403');

```
INSERT INTO Plane (PlaneID, TailNumber, Capacity, EmployeeID, WarehouseID)
```

```
VALUES
```

```
('PI101', 'ABC123', '5000.00', 'E301', 'W401'),  
( 'PI102', 'XYZ789', '6000.00', 'E305', 'W405'),  
( 'PI103', 'DEF456', '5500.00', 'E301', 'W402'),  
( 'PI104', 'GHI789', '7000.00', 'E305', 'W404'),  
( 'PI105', 'JKL012', '4500.00', 'E305', 'W403');
```

```
INSERT INTO Package (PackageID, Type, Weight, DeliveryTime, Status, AccountID, CreditCardNumber,  
EmployeeID, TruckID, PlaneID, WarehouseID)
```

```
VALUES
```

```
('P1001', 'Box', '10.5', '2024-04-01 10:00:00', 'Delivered', '201', '1234567890123456', 'E301', 'T1721',  
'PI101', 'W401'),  
( 'P1002', 'Envelope', '5.2', '2024-04-02 15:00:00', 'Delivered', '202', '2345678901234567', 'E305',  
'T1722', 'PI102', 'W405'),  
( 'P1003', 'Box', '8.8', '2024-04-03 12:30:00', 'Delivered', '203', '3456789012345678', 'E301', 'T1723',  
'PI103', 'W402'),  
( 'P1004', 'Package', '12.0', '2024-04-04 09:45:00', 'In Transit', '204', '4567890123456789', 'E305',  
'T1724', 'PI104', 'W404'),  
( 'P1005', 'Crate', '3.5', '2024-04-05 14:00:00', 'In Transit', '205', '5678901234567890', 'E301', 'T1721',  
'PI105', 'W403');
```

```
INSERT INTO Orders (PackageID, SenderID, ReceiverID, ShippingDate, ShippingCost, PromisedTime)
```

```
VALUES
```

```
('P1001', 'C101', 'C103', '2024-04-01 10:00:00', 2525.00, '2024-04-04 12:00:00'),  
( 'P1002', 'C102', 'C104', '2023-04-02 15:00:00', 250.00, '2023-04-03 18:00:00'),  
( 'P1003', 'C103', 'C105', '2024-03-03 12:30:00', 2000.00, '2024-04-06 10:00:00'),  
( 'P1004', 'C104', 'C105', '2024-04-04 09:45:00', 3030.00, '2024-04-07 14:00:00'),  
( 'P1005', 'C105', 'C102', '2023-04-05 14:00:00', 4215.00, '2023-04-08 16:00:00');
```



```
INSERT INTO loc_of_pkg (PackageID, WarehouseID, Start_timestamp, End_timestamp)
```

```
VALUES
```

```
('P1001', 'W401', '2024-04-20 10:00:00', '2024-04-20 12:00:00'),  
( 'P1002', 'W402', '2024-04-19 15:30:00', '2024-04-19 18:00:00'),  
( 'P1003', 'W401', '2024-04-18 09:00:00', '2024-04-18 11:30:00'),  
( 'P1004', 'W403', '2024-04-17 14:00:00', '2024-04-17 16:30:00'),  
( 'P1001', 'W402', '2024-04-30 10:00:00', '2024-05-05 12:00:00'),  
( 'P1002', 'W401', '2024-04-21 15:30:00', '2024-04-25 16:00:00'),  
( 'P1005', 'W402', '2024-04-16 11:45:00', '2024-04-16 13:30:00');
```

```
INSERT INTO Works (EmployeeID, TruckID, PlaneID)
```

```
VALUES
```

```
('E301', 'T1721', 'PI101'),  
( 'E302', 'T1725', 'PI102'),  
( 'E303', 'T1724', 'PI104'),  
( 'E304', 'T1723', 'PI103'),  
( 'E305', 'T1722', 'PI105');
```

**Q1.a Assume truck 1721 is destroyed in a crash. Find all customers who had a package on that truck at the time of the crash. Find all recipients who had a package on that truck at the time of the crash. Find the last successful delivery by that truck prior to the crash.**

**CODE:**

```
SELECT DISTINCT Customer.Name, Customer.Address
```

```
FROM Package
```

```
JOIN Orders ON Package.PackageID = Orders.PackageID
```

```
JOIN customer ON customer.CustomerID = Orders.SenderID
```

```
WHERE Package.TruckID = 'T1721' and Package.Status <> 'Delivered';
```

```
select * from package;
```

```
update package
```

```
set status = 'In Transit' where packageid = 'P1003';
```

**OUTPUT:**

	Name	Address
▶	Daniel Brown	555 Cedar St, Miami, FL, USA

```
-- 1.b
```

```
SELECT DISTINCT customer.Name, customer.Address
```

```
FROM Package
```

```
JOIN Orders ON Package.PackageID = Orders.PackageID
```

```
JOIN customer ON customer.CustomerID= Orders.ReceiverID
```

```
WHERE Package.TruckID = 'T1721';
```

```
select * from package;
```

```
update package
```

```
set Status='Delivered' where packageid='P1001';
```

	Name	Address
▶	Michael Williams	789 Oak St, New York, NY, USA
	Emily Johnson	456 Elm St, Chicago, IL, USA

```
-- 1.c
```

```
SELECT MAX(DeliveryTime),PackageID
```

```
FROM Package
```

```
where TruckID = 'T1721' AND Status = 'Delivered'
```

```
group by packageID;
```

	MAX(DeliveryTime)	PackageID
▶	2024-04-01 10:00:00	P1001

**Q 2 Find the customer who has shipped the most packages in the past year.**

**CODE:**

```
SELECT Customer.Name, COUNT(Package.PackageID)
FROM Package
JOIN orders ON Package.PackageID = orders.PackageID
JOIN customer ON customer.customerID= orders.senderID
WHERE year(orders.ShippingDate) = year(date_sub(curdate(),interval 1 year))
GROUP BY Customer.Name
ORDER BY COUNT(Package.PackageID) DESC
LIMIT 1;
```

	Name	COUNT(Package.PackageID)
▶	Emily Johnson	1

**Q 3 Find the customer who has spent the most money on shipping in the past year.**

**CODE:**

```
SELECT Customer.Name, SUM(orders.ShippingCost)
FROM Package
JOIN orders ON Package.packageID = orders.packageID
JOIN customer on customer.customerID= orders.senderID
WHERE year(orders.ShippingDate) = year(date_sub(curdate(),interval 1 year))
GROUP BY Customer.Name
ORDER BY SUM(orders.ShippingCost) DESC
LIMIT 1;
```

	Name	SUM(orders.ShippingCost)
▶	Daniel Brown	4215.00

**Q 4 Find the street with the most customers.**

**CODE:**

```
SELECT street, COUNT(CustomerID)
FROM Customer
GROUP BY street
ORDER BY COUNT(CustomerID) DESC
LIMIT 1;
```

	street	COUNT(CustomerID)
▶	Main St	1

**Q 5 Find those packages that were not delivered within the promised time.**

```
SELECT package.PackageID, DeliveryTime, PromisedTime
FROM package
JOIN orders on orders.packageID= package.packageID
WHERE package.DeliveryTime > orders.PromisedTime;
```

	PackageID	DeliveryTime	PromisedTime
▶	P1002	2024-04-02 15:00:00	2023-04-03 18:00:00
	P1005	2024-04-05 14:00:00	2023-04-08 16:00:00

**Q6.a Generate the bill for each customer for the past month. Consider creating several types of bills.**

- A simple bill: customer, address, and amount owed.
- A bill listing charges by type of service.
- An itemize billing listing each individual shipment and the charges for it.

```
SELECT Customer.Name, Customer.Address, SUM(orders.ShippingCost)
FROM orders
```

JOIN Customer ON orders.senderID = Customer.CustomerID

WHERE month(orders.ShippingDate) = month(date\_sub(curdate(),interval 1 month))

GROUP BY Customer.Name, Customer.Address;

	Name	Address	SUM(orders.ShippingCost)
▶	Michael Williams	789 Oak St, New York, NY, USA	2000.00

-- 6.b

SELECT Customer.Name, Package.Type, SUM(orders.ShippingCost)

FROM Package

JOIN orders ON Package.packageID = orders.packageID

JOIN customer ON customer.customerID = orders.senderID

WHERE month(orders.ShippingDate) = month(date\_sub(curdate(),interval 1 month))

GROUP BY Customer.Name, Package.Type;

	Name	Type	SUM(orders.ShippingCost)
▶	Michael Williams	Box	2000.00

-- 6.c

SELECT Customer.Name, Package.PackageID,Package.Type, orders.ShippingDate, orders.ShippingCost

FROM Package

JOIN orders ON Package.packageID = orders.packageID

JOIN customer on customer.customerID = orders.senderID

WHERE month(orders.ShippingDate) = month(date\_sub(curdate(),interval 1 month));

	Name	PackageID	Type	ShippingDate	ShippingCost
▶	Michael Williams	P1003	Box	2024-03-03 12:30:00	2000.00