INFO 579 Week 16 Final Project Report

INFO 579: SQL/NoSQL Databases for Data and Information Sciences

Group Members: Sharad Talekar, Avi Kumar Talaviya, Ayesha Siddiqua Guffran, Prathamesh Deshpande, Ankur Singh

Name: INFO_579_SEC001_2254-1 – 4

1. **Create tables using a database system. Insert data into the database tables. You must provide the DDL (CREATE TABLE statements), INSERT statements, and SELECT statements.**

```
CREATE TABLE CUSTOMERS (
   CustomerID INT PRIMARY KEY,
   FirstName VARCHAR(100),
   LastName VARCHAR(100),
   CustomerEmail VARCHAR(255) UNIQUE,
   Age INT,
   is_verified BIT,
   BirthDay INT,
   BirthMonth INT,
   BirthYear INT
);
```

```
mysql> CREATE TABLE CUSTOMERS (
    ->     CustomerID INT PRIMARY KEY,
    ->     FirstName VARCHAR(100),
    ->     LastName VARCHAR(100),
    ->     CustomerEmail VARCHAR(255) UNIQUE,
    ->     Age INT,
    ->     is_verified BIT,
    ->     BirthDay INT,
    ->     BirthMonth INT,
    ->     BirthYear INT
    -> );
Query OK, 0 rows affected (0.07 sec)
```

```
CREATE TABLE CATEGORIES (
   CategoryID INT PRIMARY KEY,
   CategoryName VARCHAR(100),
   CategoryDescription TEXT,
   ImageUrl VARCHAR(255)
);
```

```
mysql> CREATE TABLE CATEGORIES (
    ->     CategoryID INT PRIMARY KEY,
    ->     CategoryName VARCHAR(100),
    ->     CategoryDescription TEXT,
    ->     ImageUrl VARCHAR(255)
    -> );
Query OK, 0 rows affected (0.08 sec)
```

```
CREATE TABLE ADDRESSES (
   AddressID INT PRIMARY KEY,
   PinCode VARCHAR(20),
   Num_street VARCHAR(255),
   City VARCHAR(100),
   State VARCHAR(100),
   Country VARCHAR(100)
);
```

```
mysql> CREATE TABLE ADDRESSES (
    ->     AddressID INT PRIMARY KEY,
    ->     PinCode VARCHAR(20),
    ->     Num_street VARCHAR(255),
    ->     City VARCHAR(100),
    ->     State VARCHAR(100),
    ->     Country VARCHAR(100)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE SHOPPERS (
   DeliveryAgentID INT PRIMARY KEY,
   Name VARCHAR(100),
   Contact VARCHAR(50),
   CurrentLocation VARCHAR(255),
   DeliveryMode VARCHAR(50),
   Email VARCHAR(255) UNIQUE
);
```

```
mysql> CREATE TABLE SHOPPERS (
    ->     DeliveryAgentID INT PRIMARY KEY,
    ->     Name VARCHAR(100),
    ->     Contact VARCHAR(50),
    ->     CurrentLocation VARCHAR(255),
    ->     DeliveryMode VARCHAR(50),
    ->     Email VARCHAR(255) UNIQUE
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE PHONENUMBER (
   PhoneID INT PRIMARY KEY,
   CustomerID INT NOT NULL,
   PhoneNumber VARCHAR(20),
   FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
);
```

```
mysql> CREATE TABLE PHONENUMBER (
    ->     PhoneID INT PRIMARY KEY,
    ->     CustomerID INT NOT NULL,
    ->     PhoneNumber VARCHAR(20),
    ->     FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
    -> );
Query OK, 0 rows affected (0.05 sec)
```

```
CREATE TABLE CART (
   CartID INT PRIMARY KEY,
   Cart_Status VARCHAR(50),
   Timestamp DATETIME,
   CustomerID INT NOT NULL,
   FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
);
```

```
mysql> CREATE TABLE CART (
    ->     CartID INT PRIMARY KEY,
    ->     Cart_Status VARCHAR(50),
    ->     Timestamp DATETIME,
    ->     CustomerID INT NOT NULL,
    ->     FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
    -> );
Query OK, 0 rows affected (0.06 sec)
```

```
CREATE TABLE PRODUCTS (
   ProductID INT PRIMARY KEY,
   Name VARCHAR(255),
   Description TEXT,
   Price DECIMAL(10, 2),
   CategoryID INT NOT NULL,
   FOREIGN KEY (CategoryID) REFERENCES CATEGORIES(CategoryID)
);
```

```
mysql> CREATE TABLE PRODUCTS (
    ->     ProductID INT PRIMARY KEY,
    ->     Name VARCHAR(255),
    ->     Description TEXT,
    ->     Price DECIMAL(10, 2),
    ->     CategoryID INT NOT NULL,
    ->     FOREIGN KEY (CategoryID) REFERENCES CATEGORIES(CategoryID)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE STORES (
   StoreID INT PRIMARY KEY,
   Location VARCHAR(255),
   StoreName VARCHAR(100),
   StoreDescription TEXT,
   AddressID INT NOT NULL,
   FOREIGN KEY (AddressID) REFERENCES ADDRESSES(AddressID)
);
```

```
mysql> CREATE TABLE STORES (
    ->     StoreID INT PRIMARY KEY,
    ->     Location VARCHAR(255),
    ->     StoreName VARCHAR(100),
    ->     StoreDescription TEXT,
    ->     AddressID INT NOT NULL,
    ->     FOREIGN KEY (AddressID) REFERENCES ADDRESSES(AddressID)
    -> );
Query OK, 0 rows affected (0.05 sec)
```

```
CREATE TABLE CUSTOMERADDRESS (
   CustomerID INT NOT NULL,
   AddressID INT NOT NULL,
   PRIMARY KEY (CustomerID, AddressID),
   FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID),
   FOREIGN KEY (AddressID) REFERENCES ADDRESSES(AddressID)
);
```

```
mysql> CREATE TABLE CUSTOMERADDRESS (
    ->     CustomerID INT NOT NULL,
    ->     AddressID INT NOT NULL,
    ->     PRIMARY KEY (CustomerID, AddressID),
    ->     FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID),
    ->     FOREIGN KEY (AddressID) REFERENCES ADDRESSES(AddressID)
    -> );
Query OK, 0 rows affected (0.05 sec)
```

```
CREATE TABLE PRODUCTDETAILS (
   ProductID INT PRIMARY KEY,
   ProductWeight DECIMAL(10, 2),
   ProductHeight DECIMAL(10, 2),
   ProductLength DECIMAL(10, 2),
   ProductDiameter DECIMAL(10, 2),
   ProductInventory INT,
   FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID)
);
```

```
mysql> CREATE TABLE PRODUCTDETAILS (
    ->     ProductID INT PRIMARY KEY,
    ->     ProductWeight DECIMAL(10, 2),
    ->     ProductHeight DECIMAL(10, 2),
    ->     ProductLength DECIMAL(10, 2),
    ->     ProductDiameter DECIMAL(10, 2),
    ->     ProductInventory INT,
    ->     FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE PRODUCTSTORE (
   ProductID INT NOT NULL,
   StoreID INT NOT NULL,
   PRIMARY KEY (ProductID, StoreID),
   FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID),
   FOREIGN KEY (StoreID) REFERENCES STORES(StoreID)
);
```

```
mysql> CREATE TABLE PRODUCTSTORE (
    ->     ProductID INT NOT NULL,
    ->     StoreID INT NOT NULL,
    ->     PRIMARY KEY (ProductID, StoreID),
    ->     FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID),
    ->     FOREIGN KEY (StoreID) REFERENCES STORES(StoreID)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE REVIEWS (
   ReviewID INT PRIMARY KEY,
   ProductID INT NOT NULL,
   CustomerID INT NOT NULL,
   Rating INT,
   Comments TEXT,
   Timestamp DATETIME,
   FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID),
   FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
);
```

```
mysql> CREATE TABLE REVIEWS (
    ->     ReviewID INT PRIMARY KEY,
    ->     ProductID INT NOT NULL,
    ->     CustomerID INT NOT NULL,
    ->     Rating INT,
    ->     Comments TEXT,
    ->     Timestamp DATETIME,
    ->     FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID),
    ->     FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
    -> );
Query OK, 0 rows affected (0.05 sec)
```

```
CREATE TABLE CARTITEMS (
   CartItemID INT PRIMARY KEY,
   CartID INT NOT NULL,
   ProductID INT NOT NULL,
   Quantity INT,
```

```
  UnitPrice DECIMAL(10, 2),
  Timestamp DATETIME,
  FOREIGN KEY (CartID) REFERENCES CART(CartID),
  FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID)
);
```

```
mysql> CREATE TABLE CARTITEMS (
    ->     CartItemID INT PRIMARY KEY,
    ->     CartID INT NOT NULL,
    ->     ProductID INT NOT NULL,
    ->     Quantity INT,
    ->     UnitPrice DECIMAL(10, 2),
    ->     Timestamp DATETIME,
    ->     FOREIGN KEY (CartID) REFERENCES CART(CartID),
    ->     FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID)
    -> );
Query OK, 0 rows affected (0.05 sec)
```

```
CREATE TABLE PAYMENTS (
  PaymentID INT PRIMARY KEY,
  Amount DECIMAL(10, 2),
  Currency VARCHAR(10),
  PaymentDay INT,
  PaymentMonth INT,
  PaymentYear INT,
  Quantity INT,
  ModeOfPayment VARCHAR(50),
  PaymentMethod VARCHAR(50),
  OrderID INT -- Foreign Key will be added *after* ORDERS table is created
);
```

```
mysql> CREATE TABLE PAYMENTS (
    ->     PaymentID INT PRIMARY KEY,
    ->     Amount DECIMAL(10, 2),
    ->     Currency VARCHAR(10),
    ->     PaymentDay INT,
    ->     PaymentMonth INT,
    ->     PaymentYear INT,
    ->     Quantity INT,
    ->     ModeOfPayment VARCHAR(50),
    ->     PaymentMethod VARCHAR(50),
    ->     OrderID INT -- Foreign Key will be added *after* ORDERS table is crea
ted
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE DELIVERIES (
  DeliveryID INT PRIMARY KEY,
  Actual_Delivery_Time DATETIME,
  Estimated_Delivery_Time DATETIME,
  DeliveryDate DATETIME,
  DeliveryMonth INT,
  DeliveryYear INT,
  DeliveryInstructions TEXT,
  DeliveryAddress VARCHAR(255),
  Delivery_Status VARCHAR(50),
  AddressID INT NOT NULL,
  OrderID INT, -- Foreign Key will be added *after* ORDERS table is created
  FOREIGN KEY (AddressID) REFERENCES ADDRESSES(AddressID)
);
```

```
mysql> CREATE TABLE DELIVERIES (
    ->     DeliveryID INT PRIMARY KEY,
    ->     Actual_Delivery_Time DATETIME,
    ->     Estimated_Delivery_Time DATETIME,
    ->     DeliveryDate DATETIME,
    ->     DeliveryMonth INT,
    ->     DeliveryYear INT,
    ->     DeliveryInstructions TEXT,
    ->     DeliveryAddress VARCHAR(255),
    ->     Delivery_Status VARCHAR(50),
    ->     AddressID INT NOT NULL,
    ->     OrderID INT, -- Foreign Key will be added *after* ORDERS table is cre
ated
    ->     FOREIGN KEY (AddressID) REFERENCES ADDRESSES(AddressID)
    -> );
Query OK, 0 rows affected (0.03 sec)
```

```
CREATE TABLE ORDERS (
  OrderID INT PRIMARY KEY,
  OrderDay INT,
  OrderMonth INT,
  OrderYear INT,
  OrderStatus VARCHAR(50),
  CreatedAt DATETIME,
  PaymentID INT NOT NULL,
  DeliveryID INT NOT NULL,
  CustomerID INT NOT NULL,
  FOREIGN KEY (PaymentID) REFERENCES PAYMENTS(PaymentID),
  FOREIGN KEY (DeliveryID) REFERENCES DELIVERIES(DeliveryID),
  FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
);
```

```
mysql> CREATE TABLE ORDERS (
    ->     OrderID INT PRIMARY KEY,
    ->     OrderDay INT,
    ->     OrderMonth INT,
    ->     OrderYear INT,
    ->     OrderStatus VARCHAR(50),
    ->     CreatedAt DATETIME,
    ->     PaymentID INT NOT NULL,
    ->     DeliveryID INT NOT NULL,
    ->     CustomerID INT NOT NULL,
    ->     FOREIGN KEY (PaymentID) REFERENCES PAYMENTS(PaymentID),
    ->     FOREIGN KEY (DeliveryID) REFERENCES DELIVERIES(DeliveryID),
    ->     FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID)
    -> );
Query OK, 0 rows affected (0.07 sec)
```

```
CREATE TABLE CUSTOMERCARTPAY (
  CustomerID INT NOT NULL,
  PaymentID INT NOT NULL,
  CartID INT NOT NULL,
  PRIMARY KEY (CustomerID, PaymentID, CartID),
  FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID),
  FOREIGN KEY (PaymentID) REFERENCES PAYMENTS(PaymentID),
  FOREIGN KEY (CartID) REFERENCES CART(CartID)
);
```

```
mysql> CREATE TABLE CUSTOMERCARTPAY (
    ->     CustomerID INT NOT NULL,
    ->     PaymentID INT NOT NULL,
    ->     CartID INT NOT NULL,
    ->     PRIMARY KEY (CustomerID, PaymentID, CartID),
    ->     FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID),
    ->     FOREIGN KEY (PaymentID) REFERENCES PAYMENTS(PaymentID),
    ->     FOREIGN KEY (CartID) REFERENCES CART(CartID)
    -> );
Query OK, 0 rows affected (0.06 sec)
```

```
CREATE TABLE DELIVERYSHOPPER (
  DeliveryID INT NOT NULL,
  DeliveryAgentID INT NOT NULL,
  PRIMARY KEY (DeliveryID, DeliveryAgentID),
  FOREIGN KEY (DeliveryID) REFERENCES DELIVERIES(DeliveryID),
  FOREIGN KEY (DeliveryAgentID) REFERENCES SHOPPERS(DeliveryAgentID)
);
```

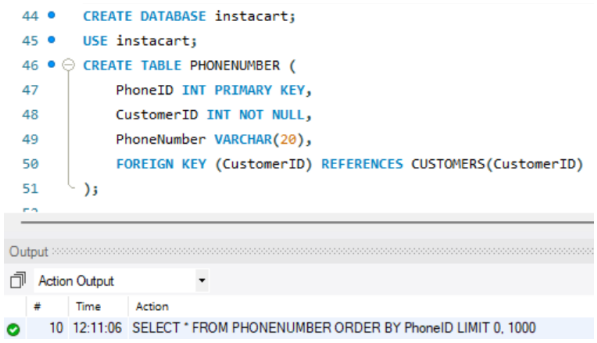
```
mysql> CREATE TABLE DELIVERYSHOPPER (
    ->     DeliveryID INT NOT NULL,
    ->     DeliveryAgentID INT NOT NULL,
    ->     PRIMARY KEY (DeliveryID, DeliveryAgentID),
    ->     FOREIGN KEY (DeliveryID) REFERENCES DELIVERIES(DeliveryID),
    ->     FOREIGN KEY (DeliveryAgentID) REFERENCES SHOPPERS(DeliveryAgentID)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE ORDERITEMS (
  OrderItemID INT PRIMARY KEY,
  OrderID INT NOT NULL,
  ProductID INT NOT NULL,
  Quantity INT,
  FOREIGN KEY (OrderID) REFERENCES ORDERS(OrderID),
  FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID)
);
```

```
mysql> CREATE TABLE ORDERITEMS (
    ->     OrderItemID INT PRIMARY KEY,
    ->     OrderID INT NOT NULL,
    ->     ProductID INT NOT NULL,
    ->     Quantity INT,
    ->     FOREIGN KEY (OrderID) REFERENCES ORDERS(OrderID),
    ->     FOREIGN KEY (ProductID) REFERENCES PRODUCTS(ProductID)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

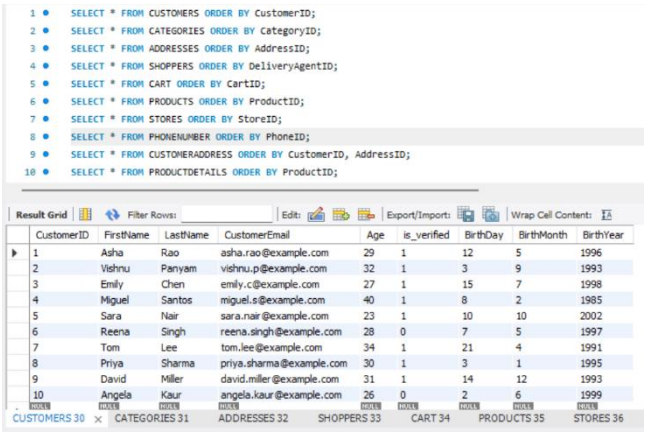
(a) Columns, Primary Key (PK), Data Type and length, and NULL/NOT NULL need to be implemented.

CREATE DATABASE instacart;
USE instacart;
CREATE TABLE PHONENUMBER (
PhoneID INT PRIMARY KEY,
CustomerID INT NOT NULL,
PhoneNumber VARCHAR(20),
FOREIGN KEY (CustomerID) REFERENCES CUSTOMERS(CustomerID));



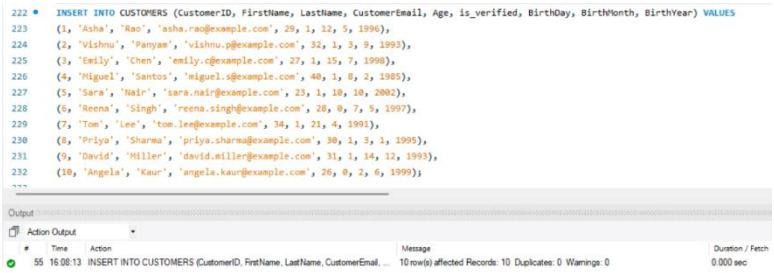
(b) Show the definition (DDL) that you implemented (not in a graphical view).

SELECT * FROM CUSTOMERS ORDER BY CustomerID;
SELECT * FROM CATEGORIES ORDER BY CategoryID;
SELECT * FROM ADDRESSES ORDER BY AddressID;
SELECT * FROM SHOPPERS ORDER BY DeliveryAgentID;
SELECT * FROM CART ORDER BY CartID;
SELECT * FROM PRODUCTS ORDER BY ProductID;
SELECT * FROM STORES ORDER BY StoreID;
SELECT * FROM PHONENUMBER ORDER BY PhoneID;
SELECT * FROM CUSTOMERADDRESS ORDER BY CustomerID, AddressID;
SELECT * FROM PRODUCTDETAILS ORDER BY ProductID;
SELECT * FROM PRODUCTSTORE ORDER BY ProductID, StoreID;
SELECT * FROM REVIEWS ORDER BY ReviewID;
SELECT * FROM CARTITEMS ORDER BY CartItemID;
SELECT * FROM PAYMENTS ORDER BY PaymentID;
SELECT * FROM DELIVERIES ORDER BY DeliveryID;



SELECT * FROM ORDERS ORDER BY OrderID;
SELECT * FROM CUSTOMERCARTPAY ORDER BY CustomerID, PaymentID, CartID;
SELECT * FROM DELIVERYSHOPPER ORDER BY DeliveryID, DeliveryAgentID;
SELECT * FROM ORDERITEMS ORDER BY OrderItemID;

(c) Insert the complete set of data that you have come up with and show the insert statements used.

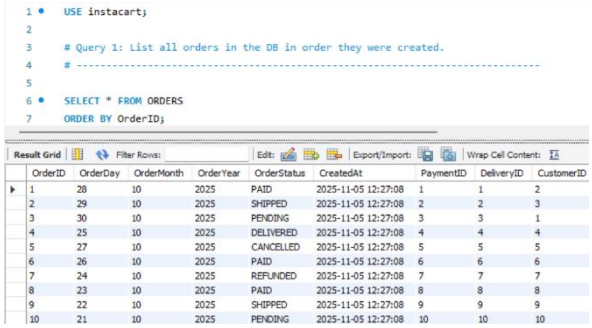


```
INSERT INTO CUSTOMERS (CustomerID, FirstName, LastName, CustomerEmail, Age, is_verified, BirthDay, BirthMonth, BirthYear) VALUES
(1, 'Asha', 'Rao', 'asha.rao@example.com', 29, 1, 12, 5, 1996),
(2, 'Vishnu', 'Panyam', 'vishnu.p@example.com', 32, 1, 3, 9, 1993),
(3, 'Emily', 'Chen', 'emily.c@example.com', 27, 1, 15, 7, 1998),
(4, 'Miguel', 'Santos', 'miguel.s@example.com', 40, 1, 8, 2, 1985),
(5, 'Sara', 'Nair', 'sara.nair@example.com', 23, 1, 10, 10, 2002),
(6, 'Reena', 'Singh', 'reena.singh@example.com', 28, 0, 7, 5, 1997),
(7, 'Tom', 'Lee', 'tom.lee@example.com', 34, 1, 21, 4, 1991),
(8, 'Priya', 'Sharma', 'priya.sharma@example.com', 30, 1, 3, 1, 1995),
(9, 'David', 'Miller', 'david.miller@example.com', 31, 1, 14, 12, 1993),
(10, 'Angela', 'Kaur', 'angela.kaur@example.com', 26, 0, 2, 6, 1999);
```

2. Create a variety of SQL queries to retrieve data from one or many tables:

1. Retrieve the data from each table by using the SELECT * statement and order by PK column(s). Show the output. Make sure you show the print screen of the complete set of rows and columns. The rows must be ordered by PK column(s).

```
USE instacart;
SELECT * FROM ORDERS
ORDER BY OrderID;
```

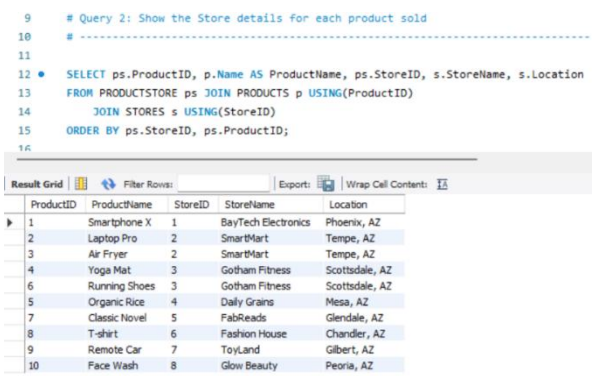


```
USE instacart;

# Query 1: List all orders in the DB in order they were created.
# ----------------------------------------------------------------------

SELECT * FROM ORDERS
ORDER BY OrderID;
```

OrderID	OrderDay	OrderMonth	OrderYear	OrderStatus	CreatedAt	PaymentID	DeliveryID	CustomerID
1	28	10	2025	PAID	2025-11-05 12:27:08	1	1	2
2	29	10	2025	SHIPPED	2025-11-05 12:27:08	2	2	3
3	30	10	2025	PENDING	2025-11-05 12:27:08	3	3	1
4	25	10	2025	DELIVERED	2025-11-05 12:27:08	4	4	4
5	27	10	2025	CANCELLED	2025-11-05 12:27:08	5	5	5
6	26	10	2025	PAID	2025-11-05 12:27:08	6	6	6
7	24	10	2025	REFUNDED	2025-11-05 12:27:08	7	7	7
8	23	10	2025	PAID	2025-11-05 12:27:08	8	8	8
9	22	10	2025	SHIPPED	2025-11-05 12:27:08	9	9	9
10	21	10	2025	PENDING	2025-11-05 12:27:08	10	10	10

2. **Write an SQL involving the junction table and two other related tables. You must use the INNER JOIN to connect with all three tables.**

```
SELECT ps.ProductID, p.Name AS
ProductName, ps.StoreID,
s.StoreName, s.Location
FROM PRODUCTSTORE ps JOIN
PRODUCTS p USING(ProductID)
        JOIN STORES s
USING(StoreID)
ORDER BY ps.StoreID,
ps.ProductID;
```



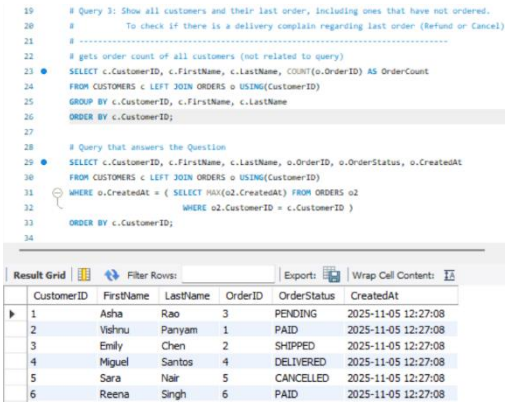
```
# Query 2: Show the Store details for each product sold
# ------------------------------------------------------------------------------

SELECT ps.ProductID, p.Name AS ProductName, ps.StoreID, s.StoreName, s.Location
FROM PRODUCTSTORE ps JOIN PRODUCTS p USING(ProductID)
    JOIN STORES s USING(StoreID)
ORDER BY ps.StoreID, ps.ProductID;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ProductID	ProductName	StoreID	StoreName	Location
1	Smartphone X	1	BayTech Electronics	Phoenix, AZ
2	Laptop Pro	2	SmartMart	Tempe, AZ
3	Air Fryer	2	SmartMart	Tempe, AZ
4	Yoga Mat	3	Gotham Fitness	Scottsdale, AZ
6	Running Shoes	3	Gotham Fitness	Scottsdale, AZ
5	Organic Rice	4	Daily Grains	Mesa, AZ
7	Classic Novel	5	FabReads	Glendale, AZ
8	T-shirt	6	Fashion House	Chandler, AZ
9	Remote Car	7	ToyLand	Gilbert, AZ
10	Face Wash	8	Glow Beauty	Peoria, AZ

3. Write an SQL by including two or more tables and using the LEFT OUTER JOIN. Show the results and sort the results by key field(s).

```
SELECT c.CustomerID, c.FirstName, c.LastName, COUNT(o.OrderID) AS
OrderCount
FROM CUSTOMERS c LEFT JOIN ORDERS o USING(CustomerID)
GROUP BY c.CustomerID, c.FirstName, c.LastName
ORDER BY c.CustomerID;
# Query that answers the Question
SELECT c.CustomerID, c.FirstName,
c.LastName, o.OrderID, o.OrderStatus,
o.CreatedAt
FROM CUSTOMERS c LEFT JOIN
ORDERS o USING(CustomerID)
WHERE o.CreatedAt = ( SELECT
MAX(o2.CreatedAt) FROM ORDERS o2
WHERE o2.CustomerID =
c.CustomerID )
ORDER BY c.CustomerID;
```



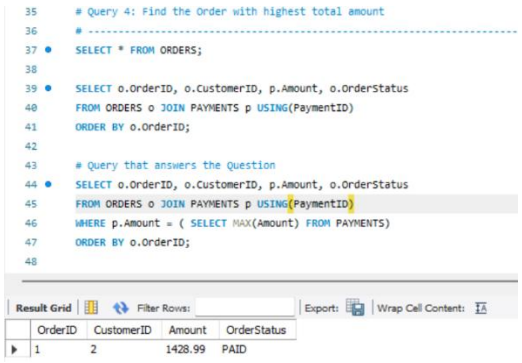
```
# Query 3: Show all customers and their last order, including ones that have not ordered.
#          To check if there is a delivery complain regarding last order (Refund or Cancel)
# ------------------------------------------------------------------------------
# gets order count of all customers (not related to query)
SELECT c.CustomerID, c.FirstName, c.LastName, COUNT(o.OrderID) AS OrderCount
FROM CUSTOMERS c LEFT JOIN ORDERS o USING(CustomerID)
GROUP BY c.CustomerID, c.FirstName, c.LastName
ORDER BY c.CustomerID;

# Query that answers the Question
SELECT c.CustomerID, c.FirstName, c.LastName, o.OrderID, o.OrderStatus, o.CreatedAt
FROM CUSTOMERS c LEFT JOIN ORDERS o USING(CustomerID)
WHERE o.CreatedAt = ( SELECT MAX(o2.CreatedAt) FROM ORDERS o2
                      WHERE o2.CustomerID = c.CustomerID )
ORDER BY c.CustomerID;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerID	FirstName	LastName	OrderID	OrderStatus	CreatedAt
1	Asha	Rao	3	PENDING	2025-11-05 12:27:08
2	Vishnu	Panyam	1	PAID	2025-11-05 12:27:08
3	Emily	Chen	2	SHIPPED	2025-11-05 12:27:08
4	Miguel	Santos	4	DELIVERED	2025-11-05 12:27:08
5	Sara	Nair	5	CANCELLED	2025-11-05 12:27:08
6	Reena	Singh	6	PAID	2025-11-05 12:27:08

4. Write a single-row subquery. Show the results and sort the results by key field(s).

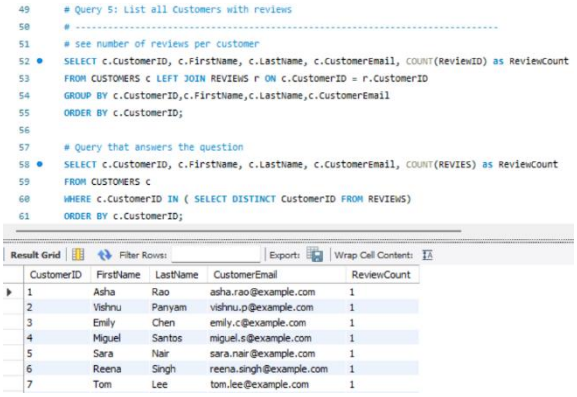
SELECT * FROM ORDERS;
SELECT o.OrderID, o.CustomerID, p.Amount, o.OrderStatus
FROM ORDERS o JOIN PAYMENTS p USING(PaymentID)
ORDER BY o.OrderID;



Query that answers the Question
SELECT o.OrderID, o.CustomerID, p.Amount, o.OrderStatus
FROM ORDERS o JOIN PAYMENTS p USING(PaymentID)
WHERE p.Amount = (SELECT MAX(Amount) FROM PAYMENTS)
ORDER BY o.OrderID;

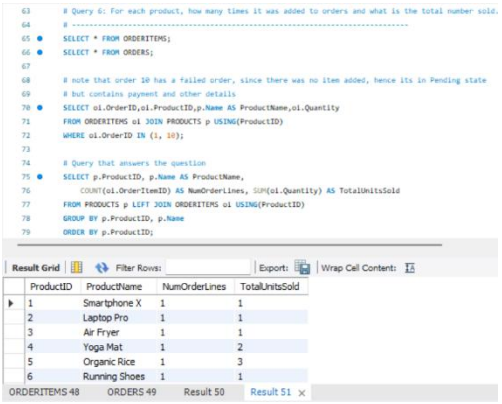
5. Write a multiple-row subquery. Show the results and sort the results by key field(s).

SELECT c.CustomerID, c.FirstName, c.LastName, c.CustomerEmail, COUNT(ReviewID) as ReviewCount
FROM CUSTOMERS c LEFT JOIN REVIEWS r
ON c.CustomerID = r.CustomerID
GROUP BY



c.CustomerID,c.FirstName,c.LastName,c.CustomerEmail
ORDER BY c.CustomerID;
Query that answers the question
SELECT c.CustomerID, c.FirstName, c.LastName, c.CustomerEmail, COUNT(reviewID) as ReviewCount
FROM CUSTOMERS c
WHERE c.CustomerID IN (SELECT DISTINCT CustomerID FROM REVIEWS)
ORDER BY c.CustomerID;

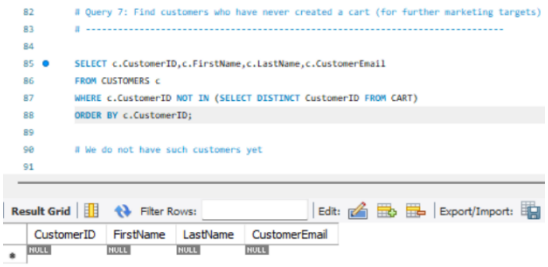
6. Write an SQL to aggregate the results by using multiple columns in the SELECT clause.



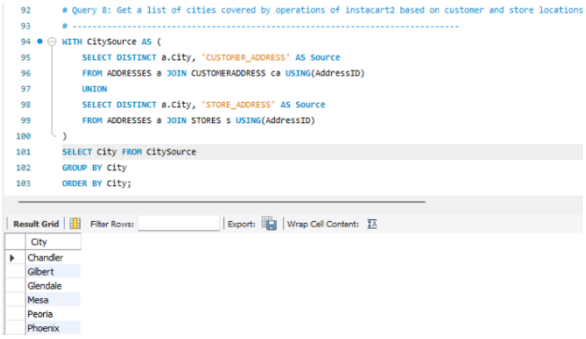
```
SELECT * FROM ORDERITEMS;
SELECT * FROM ORDERS;

# note that order 10 has a failed order,
since there was no item added, hence its
in Pending state
# but contains payment and other
details
SELECT oi.OrderID,oi.ProductID,p.Name
AS ProductName,oi.Quantity
FROM ORDERITEMS oi JOIN PRODUCTS p USING(ProductID)
WHERE oi.OrderID IN (1, 10);

# Query that answers the question
SELECT p.ProductID, p.Name AS ProductName,
        COUNT(oi.OrderItemID) AS NumOrderLines, SUM(oi.Quantity) AS
TotalUnitsSold
FROM PRODUCTS p LEFT JOIN ORDERITEMS oi USING(ProductID)
GROUP BY p.ProductID, p.Name
ORDER BY p.ProductID;
```

7. Write a subquery using the NOT IN operator. Show the results and sort the results by key field(s).

```
SELECT c.CustomerID,c.FirstName,c.LastName,c.CustomerEmail
FROM CUSTOMERS c
WHERE c.CustomerID NOT IN (SELECT
DISTINCT CustomerID FROM CART)
ORDER BY c.CustomerID;
```

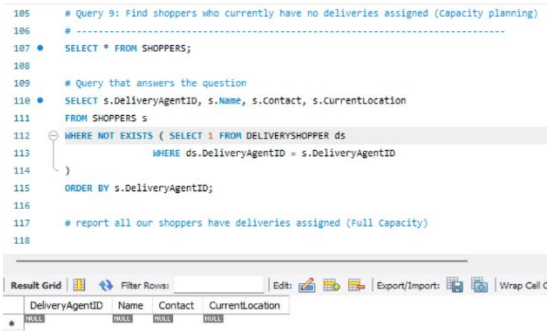


8. Write a query using a UNION statement. Show the results and sort the results by key field(s).




```
WITH CitySource AS (
SELECT DISTINCT a.City,
'CUSTOMER_ADDRESS' AS Source
        FROM ADDRESSES a JOIN
CUSTOMERADDRESS ca
USING(AddressID)
        UNION
        SELECT DISTINCT a.City, 'STORE_ADDRESS' AS Source
        FROM ADDRESSES a JOIN STORES s USING(AddressID)
)
SELECT City FROM CitySource
GROUP BY City
ORDER BY City;
```

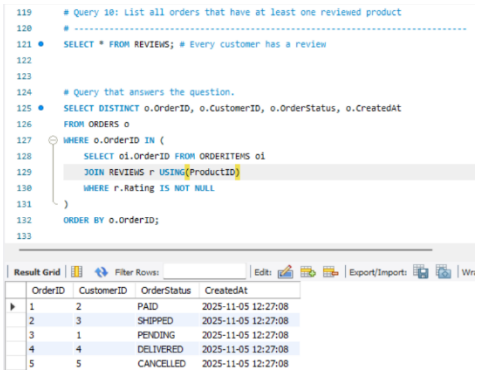
9. Write a query using the NOT EXISTS operator. Show the results and sort the results by key field(s).




```
SELECT * FROM SHOPPERS;
# Query that answers the question
SELECT s.DeliveryAgentID, s.Name,
s.Contact, s.CurrentLocation
FROM SHOPPERS s
WHERE NOT EXISTS ( SELECT 1 FROM
DELIVERYSHOPPER ds
WHERE ds.DeliveryAgentID =
s.DeliveryAgentID
)
ORDER BY s.DeliveryAgentID;
```

10. Write a subquery using the NOT NULL operator in the inner query. Show the results and sort the results by key field(s).

SELECT * FROM REVIEWS; # Every customer has a review
Query that answers the question.
SELECT DISTINCT o.OrderID, o.CustomerID, o.OrderStatus, o.CreatedAt
FROM ORDERS o
WHERE o.OrderID IN (
SELECT oi.OrderID FROM ORDERITEMS oi
JOIN REVIEWS r USING(ProductID)
WHERE r.Rating IS NOT NULL
)
ORDER BY o.OrderID;



```
119    # Query 10: List all orders that have at least one reviewed product
120    # ------------------------------------------------------------------------
121 ●  SELECT * FROM REVIEWS; # Every customer has a review
122
123
124    # Query that answers the question.
125 ●  SELECT DISTINCT o.OrderID, o.CustomerID, o.OrderStatus, o.CreatedAt
126    FROM ORDERS o
127    WHERE o.OrderID IN (
128        SELECT oi.OrderID FROM ORDERITEMS oi
129        JOIN REVIEWS r USING(ProductID)
130        WHERE r.Rating IS NOT NULL
131    )
132    ORDER BY o.OrderID;
133
```

Result Grid | Filter Rows: | Edit: | Export/Import:

OrderID	CustomerID	OrderStatus	CreatedAt
1	2	PAID	2025-11-05 12:27:08
2	3	SHIPPED	2025-11-05 12:27:08
3	1	PENDING	2025-11-05 12:27:08
4	4	DELIVERED	2025-11-05 12:27:08
5	5	CANCELLED	2025-11-05 12:27:08