**EXERCISE 8**

**Create the Employees Table:**

Write an SQL query to create the "Employees" table with the following columns:

* **EmployeeID (integer)**
* **FirstName (text)**
* **LastName (text)**
* **Department (text)**
* **Salary (decimal)**

**Create the Products Table:**

Write an SQL query to create the "Products" table with the following columns:

* **ProductID (integer)**
* **ProductName (text)**
* **Category (text)**
* **Price (decimal)**
* **StockQuantity (integer)**

**Create the Orders Table:**

Write an SQL query to create the "Orders" table with the following columns:

* **OrderID (integer)**
* **CustomerName (text)**
* **OrderDate (date)**
* **TotalAmount (decimal)**

**Create the Customers Table:**

Write an SQL query to create the "Customers" table with the following columns:

* **CustomerID (integer)**
* **CustomerName (text)**
* **City (text)**
* **State (text)**

**For the Employees Table:**

Write SQL insert statements to add the following 15 sample employee records to the "Employees" table:

1. Insert an employee with EmployeeID 1, FirstName "John", LastName "Doe", Department "HR", and Salary 50000.00.
2. Insert an employee with EmployeeID 2, FirstName "Jane", LastName "Smith", Department "HR", and Salary 55000.00.
3. Insert an employee with EmployeeID 3, FirstName "Bob", LastName "Johnson", Department "IT", and Salary 60000.00.
4. Insert an employee with EmployeeID 4, FirstName "Alice", LastName "Williams", Department "IT", and Salary 65000.00.
5. Insert an employee with EmployeeID 5, FirstName "David", LastName "Brown", Department "IT", and Salary 62000.00.
6. Insert an employee with EmployeeID 6, FirstName "Mary", LastName "Davis", Department "Finance", and Salary 58000.00.
7. Insert an employee with EmployeeID 7, FirstName "Tom", LastName "Wilson", Department "Finance", and Salary 60000.00.
8. Insert an employee with EmployeeID 8, FirstName "Linda", LastName "Lee", Department "Marketing", and Salary 54000.00.
9. Insert an employee with EmployeeID 9, FirstName "Mike", LastName "Clark", Department "Marketing", and Salary 56000.00.
10. Insert an employee with EmployeeID 10, FirstName "Emily", LastName "Thomas", Department "IT", and Salary 63000.00.
11. Insert an employee with EmployeeID 11, FirstName "Peter", LastName "Evans", Department "Finance", and Salary 59000.00.
12. Insert an employee with EmployeeID 12, FirstName "Sara", LastName "Martin", Department "Marketing", and Salary 55000.00.
13. Insert an employee with EmployeeID 13, FirstName "Chris", LastName "Roberts", Department "IT", and Salary 61000.00.
14. Insert an employee with EmployeeID 14, FirstName "Laura", LastName "Garcia", Department "HR", and Salary 52000.00.
15. Insert an employee with EmployeeID 15, FirstName "Mark", LastName "Harris", Department "Finance", and Salary 57000.00.

**For the Products Table:**

Create SQL insert statements to add the following 15 sample product records to the "Products" table:

1. Insert a product with ProductID 1, ProductName "Laptop", Category "Electronics", Price 800.00, and StockQuantity 10.
2. Insert a product with ProductID 2, ProductName "Smartphone", Category "Electronics", Price 500.00, and StockQuantity 15.
3. Insert a product with ProductID 3, ProductName "Desk Chair", Category "Furniture", Price 150.00, and StockQuantity 20.
4. Insert a product with ProductID 4, ProductName "Coffee Table", Category "Furniture", Price 200.00, and StockQuantity 10.
5. Insert a product with ProductID 5, ProductName "Printer", Category "Electronics", Price 100.00, and StockQuantity 5.
6. Insert a product with ProductID 6, ProductName "Sofa", Category "Furniture", Price 450.00, and StockQuantity 12.
7. Insert a product with ProductID 7, ProductName "T-shirt", Category "Clothing", Price 20.00, and StockQuantity 50.
8. Insert a product with ProductID 8, ProductName "Jeans", Category "Clothing", Price 40.00, and StockQuantity 30.
9. Insert a product with ProductID 9, ProductName "Microwave", Category "Appliances", Price 120.00, and StockQuantity 8.
10. Insert a product with ProductID 10, ProductName "Refrigerator", Category "Appliances", Price 600.00, and StockQuantity 5.
11. Insert a product with ProductID 11, ProductName "Dining Table", Category "Furniture", Price 350.00, and StockQuantity 8.
12. Insert a product with ProductID 12, ProductName "Headphones", Category "Electronics", Price 60.00, and StockQuantity 25.
13. Insert a product with ProductID 13, ProductName "Shoes", Category "Clothing", Price 70.00, and StockQuantity 40.
14. Insert a product with ProductID 14, ProductName "Blender", Category "Appliances", Price 50.00, and StockQuantity 10.
15. Insert a product with ProductID 15, ProductName "TV", Category "Electronics", Price 900.00, and StockQuantity 6.

**For the Orders Table:**

Write SQL insert statements to insert the following 15 sample orders into the "Orders" table:

1. Insert an order with OrderID 1, CustomerName "John Smith", OrderDate '2023-10-15', and TotalAmount 300.00.
2. Insert an order with OrderID 2, CustomerName "Jane Doe", OrderDate '2023-10-16', and TotalAmount 450.00.
3. Insert an order with OrderID 3, CustomerName "Bob Johnson", OrderDate '2023-10-17', and TotalAmount 600.00.
4. Insert an order with OrderID 4, CustomerName "Alice Williams", OrderDate '2023-10-18', and TotalAmount 750.00.
5. Insert an order with OrderID 5, CustomerName "David Brown", OrderDate '2023-10-19', and TotalAmount 400.00.
6. Insert an order with OrderID 6, CustomerName "Mary Davis", OrderDate '2023-10-20', and TotalAmount 550.00.
7. Insert an order with OrderID 7, CustomerName "Tom Wilson", OrderDate '2023-10-21', and TotalAmount 700.00.
8. Insert an order with OrderID 8, CustomerName "Linda Lee", OrderDate '2023-10-22', and TotalAmount 350.00.
9. Insert an order with OrderID 9, CustomerName "Mike Clark", OrderDate '2023-10-23', and TotalAmount 900.00.
10. Insert an order with OrderID 10, CustomerName "Emily Thomas", OrderDate '2023-10-24', and TotalAmount 200.00.
11. Insert an order with OrderID 11, CustomerName "Peter Evans", OrderDate '2023-10-25', and TotalAmount 450.00.
12. Insert an order with OrderID 12, CustomerName "Sara Martin", OrderDate '2023-10-26', and TotalAmount 800.00.
13. Insert an order with OrderID 13, CustomerName "Chris Roberts", OrderDate '2023-10-27', and TotalAmount 350.00.
14. Insert an order with OrderID 14, CustomerName "Laura Garcia", OrderDate '2023-10-28', and TotalAmount 600.00.
15. Insert an order with OrderID 15, CustomerName "Mark Harris", OrderDate '2023-10-29', and TotalAmount 950.00.

**For the Customers Table:**

Create SQL insert statements to add the following 15 sample customer records to the "Customers" table:

1. Insert a customer with CustomerID 1, CustomerName "John Smith", City "New York", and State "NY".
2. Insert a customer with CustomerID 2, CustomerName "Jane Doe", City "Los Angeles", and State "CA".
3. Insert a customer with CustomerID 3, CustomerName "Bob Johnson", City "Chicago", and State "IL".
4. Insert a customer with CustomerID 4, CustomerName "Alice Williams", City "Houston", and State "TX".
5. Insert a customer with CustomerID 5, CustomerName "David Brown", City "Philadelphia", and State "PA".
6. Insert a customer with CustomerID 6, CustomerName "Mary Davis", City "Phoenix", and State "AZ".
7. Insert a customer with CustomerID 7, CustomerName "Tom Wilson", City "San Antonio", and State "TX".
8. Insert a customer with CustomerID 8, CustomerName "Linda Lee", City "San Diego", and State "CA".
9. Insert a customer with CustomerID 9, CustomerName "Mike Clark", City "Dallas", and State "TX".
10. Insert a customer with CustomerID 10, CustomerName "Emily Thomas", City "Austin", and State "TX".
11. Insert a customer with CustomerID 11, CustomerName "Peter Evans", City "San Francisco", and State "CA".
12. Insert a customer with CustomerID 12, CustomerName "Sara Martin", City "Seattle", and State "WA".
13. Insert a customer with CustomerID 13, CustomerName "Chris Roberts", City "Denver", and State "CO".
14. Insert a customer with CustomerID 14, CustomerName "Laura Garcia", City "Boston", and State "MA".
15. Insert a customer with CustomerID 15, CustomerName "Mark Harris", City "Miami", and State "FL".

**GROUP BY**

**For the Employees Table:**

1. Find the average salary for all employees.
2. List the departments and the total number of employees in each department.
3. Calculate the total salary for the HR department.
4. Find the department with the highest average salary.
5. List the departments and the maximum salary in each department.
6. Count the number of employees in the Marketing department.
7. Find the employee with the highest salary.
8. List the employees in the IT department in alphabetical order by last name.

**For the Products Table:**

1. Calculate the average price for products in the "Electronics" category.
2. List the categories and the total number of products in each category.
3. Find the category with the highest average price.
4. Calculate the total stock quantity for the "Furniture" category.
5. List the categories and the minimum price in each category.
6. Count the number of products in the "Clothing" category.
7. Find the product with the highest price.
8. List the products in descending order of stock quantity and within the same quantity, in alphabetical order of product name.

**For the Orders Table:**

1. Calculate the total amount spent by each customer and list the customers in alphabetical order by name.
2. Find the customer who spent the most in a single order.
3. List the orders placed on or after '2023-10-23'.
4. Calculate the average order amount.
5. List the customers who placed more than one order.
6. Find the customer who placed the earliest order.
7. Count the number of orders placed in October 2023.
8. List the orders in ascending order of total amount.

**For the Customers Table:**

1. List the customers in a specific city, e.g., 'New York'.
2. Find the state with the highest number of customers.
3. List the customers in alphabetical order by name.
4. Count the total number of customers.
5. Find the customer with the longest name (maximum character length).
6. List the customers in a specific state, e.g., 'TX'.
7. Calculate the average customer name length.
8. Find the state with the fewest customers.

**GROUP BY - HAVING CLAUSE**

**For the Employees Table:**

1. Find the average salary for departments with more than 2 employees.
2. List the departments with at least 3 employees and calculate the total salary for each.
3. Find the department with the highest average salary for employees earning more than $55,000.
4. Calculate the total salary for departments where the minimum salary is less than $55,000.
5. List the departments with an average salary above $58,000 and more than 2 employees.
6. Find the department with the highest total salary for employees with salaries between $50,000 and $60,000.
7. List the departments with exactly 2 employees and find the maximum salary in each.
8. Calculate the average salary for the Marketing department and list it only if it's above $55,000.

**For the Products Table:**

1. Calculate the average price for products with a stock quantity greater than 10.
2. List the categories with at least 5 products and find the maximum price in each.
3. Find the category with the highest average price for products costing less than $100.
4. Calculate the total stock quantity for categories where the minimum price is above $30.
5. List the categories with an average price below $70 and at least 3 products.
6. Find the category with the lowest total stock quantity for products with prices above $50.
7. List the categories with exactly 4 products and find the minimum price in each.
8. Calculate the average price for the Electronics category and list it only if it's below $75.

**For the Orders Table:**

1. Calculate the total amount spent by customers who placed more than 2 orders.
2. List the customers who spent at least $500 in a single order and find the highest total amount spent by each.
3. Find the orders placed on or after '2023-10-23' with a total amount greater than $400.
4. Calculate the average order amount for orders with more than 1 item.
5. List the customers who placed exactly 1 order and find the minimum total amount spent.
6. Find the orders placed in October 2023 with a total amount less than $600.
7. Calculate the total amount spent by customers with names longer than 10 characters.
8. List the orders with at least 2 items and find the maximum total amount.

**For the Customers Table:**

1. List the customers in a specific city, e.g., 'New York', and find the total number of customers in that city.
2. Find the states with more than 2 customers and calculate the average name length for customers in each state.
3. List the customers in alphabetical order by name, but only if their names contain the letter 'a'.
4. Count the total number of customers in each state and find the states with exactly 1 customer.
5. Find the customer with the longest name (maximum character length) and their state.
6. List the customers in a specific state, e.g., 'TX', and calculate the total number of customers in that state.
7. Calculate the average customer name length for customers in states with more than 3 customers.
8. Find the states with the fewest customers and list the customers in those states.

**GROUP BY - HAVING AND ORDER BY**

**For the Employees Table:**

1. List the departments with at least 2 employees, calculate the total salary for each, and order them by total salary in descending order.
2. Find the department with the highest average salary for employees earning more than $55,000, and order the results by the average salary in descending order.
3. List the departments and the maximum salary in each department, and order them by the maximum salary in ascending order.
4. Find the department with the lowest average salary for employees with salaries less than $60,000 and order the results by the average salary in ascending order.
5. Calculate the total salary for departments where the minimum salary is less than $55,000, and order the results by total salary in descending order.
6. List the departments with more than 3 employees, find the average salary in each department, and order them by the average salary in descending order.
7. Find the departments with exactly 2 employees, list the employees in each department, and order the results by department and then by employee last name in ascending order.
8. List the employees in the IT department in alphabetical order by last name, find the average salary in that department, and order the results by average salary in ascending order.

**For the Products Table:**

1. List the categories with at least 5 products, find the minimum price in each category, and order the results by category in ascending order.
2. Find the category with the highest average price for products costing less than $100 and order the results by the average price in descending order.
3. Calculate the total stock quantity for categories where the minimum price is above $30 and order the results by total stock quantity in descending order.
4. List the categories and the maximum price in each category, find the category with the lowest maximum price, and order the results by category in ascending order.
5. Find the categories with an average price below $70 and at least 3 products, and order the results by the average price in ascending order.
6. Calculate the average price for products with a stock quantity greater than 10, and order the results by average price in descending order.
7. List the categories with exactly 4 products, find the maximum price in each category, and order the results by category in descending order.
8. Find the category with the highest total stock quantity for products with prices above $50 and order the results by the total stock quantity in descending order.

**For the Orders Table:**

1. Calculate the total amount spent by customers who placed more than 2 orders, list the customers in alphabetical order, and order the results by total amount in descending order.
2. List the customers who spent at least $500 in a single order, find the highest total amount spent by each customer, and order the results by customer name in ascending order.
3. Find the orders placed on or after '2023-10-23' with a total amount greater than $400 and order the results by order date in ascending order.
4. Calculate the average order amount for orders with more than 1 item, list the orders in descending order by order amount, and within the same amount, order them by order date in ascending order.
5. List the customers who placed exactly 1 order, find the minimum total amount spent, and order the results by customer name in ascending order.
6. Find the orders placed in October 2023 with a total amount less than $600, list the orders in descending order by order date, and within the same date, order them by total amount in ascending order.
7. Calculate the total amount spent by customers with names longer than 10 characters, list the customers in ascending order by total amount, and within the same amount, order them by customer name in descending order.
8. List the orders with at least 2 items, find the maximum total amount, and order the results by maximum amount in descending order.

**For the Customers Table:**

1. List the customers in a specific city, e.g., 'New York', and find the total number of customers in that city, order the results by customer name in ascending order.
2. Find the states with more than 2 customers, calculate the average name length for customers in each state, and order the results by state in ascending order.
3. List the customers in alphabetical order by name, but only if their names contain the letter 'a', and order the results by customer name in ascending order.
4. Count the total number of customers in each state and find the states with exactly 1 customer, order the results by state in descending order.
5. Find the customer with the longest name (maximum character length) and their state.
6. List the customers in a specific state, e.g., 'TX', and calculate the total number of customers in that state, order the results by customer name in descending order.
7. Calculate the average customer name length for customers in states with more than 3 customers and order the results by average name length in descending order.
8. Find the states with the fewest customers, list the customers in those states, and order the results by state in ascending order.