Project No.-04

Restaurant Management System

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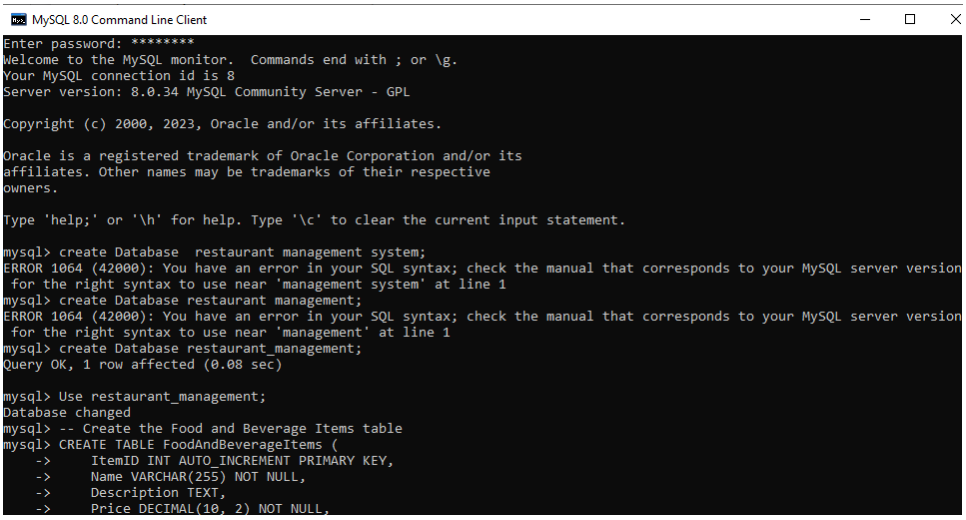
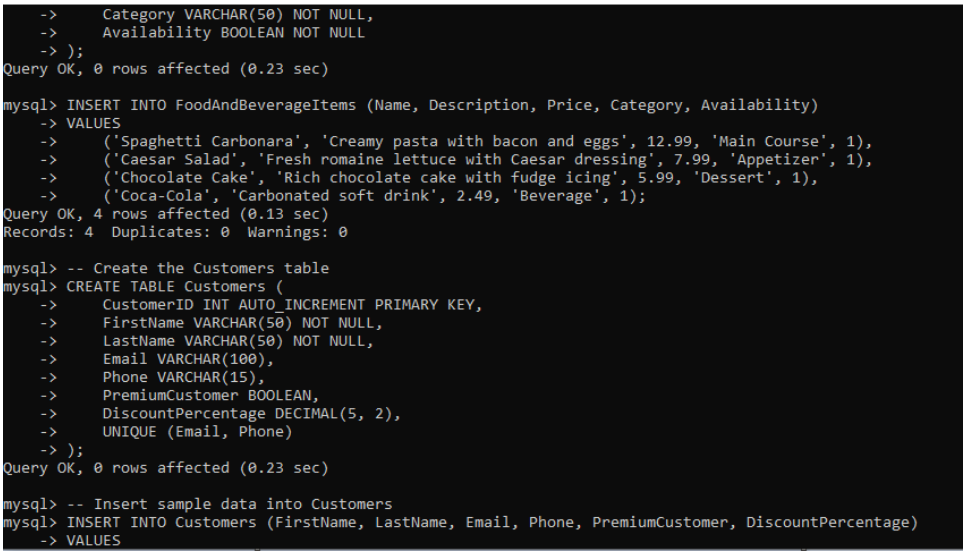
After creating a database (Restaurant_Management, for example), we will do the following (sql commands are necessary) to make the Tables:



Now we will insert values each table (example:FoodAndbeverageItems,Customers etc.)



```
    ->     ('John', 'Doe', 'johndoe@example.com', '123-456-7890', 1, 10),
    ->     ('Jane', 'Smith', 'janesmith@example.com', '987-654-3210', 0, NULL),
    ->     ('Michael', 'Johnson', 'michael@example.com', '555-555-5555', 1, 15);
Query OK, 3 rows affected (0.07 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> -- Create the Orders table
mysql> CREATE TABLE Orders (
    ->     OrderID INT AUTO_INCREMENT PRIMARY KEY,
    ->     CustomerID INT NOT NULL,
    ->     OrderDate DATE,
    ->     TotalAmount DECIMAL(10, 2) NOT NULL,
    ->     DeliveryAddress TEXT,
    ->     OrderType VARCHAR(10) NOT NULL,
    ->     FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
    -> );
Query OK, 0 rows affected (0.24 sec)

mysql> INSERT INTO Orders (CustomerID, OrderDate, TotalAmount, DeliveryAddress, OrderType)
    -> VALUES
    ->     (1, '2023-10-02', 30.97, '123 Main St, City, State', 'Online'),
    ->     (2, '2023-10-02', 15.98, '456 Elm St, City, State', 'Phone'),
    ->     (3, '2023-10-02', 25.49, '789 Oak St, City, State', 'Online');
Query OK, 3 rows affected (0.10 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> -- Create the Order Items table
mysql> CREATE TABLE OrderItems (
    ->     OrderItemID INT AUTO_INCREMENT PRIMARY KEY,
    ->     OrderID INT NOT NULL,
```

```
    ->     Quantity INT NOT NULL,
    ->     Subtotal DECIMAL(10, 2) NOT NULL,
    ->     FOREIGN KEY (OrderID) REFERENCES Orders(OrderID),
    ->     FOREIGN KEY (ItemID) REFERENCES FoodAndBeverageItems(ItemID)
    -> );
Query OK, 0 rows affected (0.24 sec)

mysql> INSERT INTO OrderItems (OrderID, ItemID, Quantity, Subtotal)
    -> VALUES
    ->     (1, 1, 2, 25.98),
    ->     (1, 2, 1, 7.99),
    ->     (2, 3, 2, 11.98),
    ->     (3, 4, 3, 7.47);
Query OK, 4 rows affected (0.07 sec)
Records: 4  Duplicates: 0  Warnings: 0

mysql> -- Create the Delivery Boys table
mysql> CREATE TABLE DeliveryBoys (
    ->     DeliveryBoyID INT AUTO_INCREMENT PRIMARY KEY,
    ->     Name VARCHAR(50) NOT NULL,
    ->     AreaCode VARCHAR(10) NOT NULL
    -> );
Query OK, 0 rows affected (0.17 sec)

mysql> INSERT INTO DeliveryBoys (Name, AreaCode)
    -> VALUES
    ->     ('David', 'A001'),
    ->     ('Sarah', 'B002'),
    ->     ('Hasan', 'Nj01');
Query OK, 3 rows affected (0.05 sec)
```

Now we will use SQL commands to show that our all values inserted on those tables Succesfully:

```
mysql> select * from FoodAndBeverageItems;
+--------+--------------------+-----------------------------------------+-------+------------+--------------+
| ItemID | Name               | Description                             | Price | Category   | Availability |
+--------+--------------------+-----------------------------------------+-------+------------+--------------+
|      1 | Spaghetti Carbonara | Creamy pasta with bacon and eggs        | 12.99 | Main Course |            1 |
|      2 | Caesar Salad       | Fresh romaine lettuce with Caesar dressing |  7.99 | Appetizer  |            1 |
|      3 | Chocolate Cake     | Rich chocolate cake with fudge icing    |  5.99 | Dessert    |            1 |
|      4 | Coca-Cola          | Carbonated soft drink                   |  2.49 | Beverage   |            1 |
+--------+--------------------+-----------------------------------------+-------+------------+--------------+
4 rows in set (0.08 sec)

mysql> select * from Customers;
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
| CustomerID | FirstName | LastName | Email                | Phone        | PremiumCustomer | DiscountPercentage |
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
|          1 | John      | Doe      | johndoe@example.com  | 123-456-7890 |               1 |              10.00 |
|          2 | Jane      | Smith    | janesmith@example.com | 987-654-3210 |               0 |               NULL |
|          3 | Michael   | Johnson  | michael@example.com  | 555-555-5555 |               1 |              15.00 |
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
3 rows in set (0.01 sec)

mysql> select * from Orders;
+---------+------------+------------+-------------+-------------------------+-----------+
| OrderID | CustomerID | OrderDate  | TotalAmount | DeliveryAddress         | OrderType |
+---------+------------+------------+-------------+-------------------------+-----------+
|       1 |          1 | 2023-10-02 |       30.97 | 123 Main St, City, State | Online    |
|       2 |          2 | 2023-10-02 |       15.98 | 456 Elm St, City, State  | Phone     |
|       3 |          3 | 2023-10-02 |       25.49 | 789 Oak St, City, State  | Online    |
+---------+------------+------------+-------------+-------------------------+-----------+
3 rows in set (0.01 sec)
```

```
mysql> select * from OrderItems;
+-------------+---------+--------+----------+----------+
| OrderItemID | OrderID | ItemID | Quantity | Subtotal |
+-------------+---------+--------+----------+----------+
|           1 |       1 |      1 |        2 |    25.98 |
|           2 |       1 |      2 |        1 |     7.99 |
|           3 |       2 |      3 |        2 |    11.98 |
|           4 |       3 |      4 |        3 |     7.47 |
+-------------+---------+--------+----------+----------+
4 rows in set (0.01 sec)

mysql> select * from DeliveryBoys;
+---------------+-------+----------+
| DeliveryBoyID | Name  | AreaCode |
+---------------+-------+----------+
|             1 | David | A001     |
|             2 | Sarah | B002     |
|             3 | Hasan | Nj01     |
+---------------+-------+----------+
3 rows in set (0.00 sec)

mysql> SHOW TABLES;
+---------------------------------+
| Tables_in_restaurant_management |
+---------------------------------+
| customers                       |
| deliveryboys                    |
| foodandbeverageitems            |
| orderitems                      |
```

a) **Describe the properties of all relations:** To describe the properties of all relations (tables) in a database, we can use the following SQL query:

```
mysql> DESCRIBE customers;
+-------------------+--------------+------+-----+---------+----------------+
| Field             | Type         | Null | Key | Default | Extra          |
+-------------------+--------------+------+-----+---------+----------------+
| CustomerID        | int          | NO   | PRI | NULL    | auto_increment |
| FirstName         | varchar(50)  | NO   |     | NULL    |                |
| LastName          | varchar(50)  | NO   |     | NULL    |                |
| Email             | varchar(100) | YES  | MUL | NULL    |                |
| Phone             | varchar(15)  | YES  |     | NULL    |                |
| PremiumCustomer   | tinyint(1)   | YES  |     | NULL    |                |
| DiscountPercentage | decimal(5,2) | YES  |     | NULL    |                |
+-------------------+--------------+------+-----+---------+----------------+
7 rows in set (0.06 sec)

mysql> DESCRIBE deliveryboys;
+--------------+------------+------+-----+---------+----------------+
| Field        | Type       | Null | Key | Default | Extra          |
+--------------+------------+------+-----+---------+----------------+
| DeliveryBoyID | int        | NO   | PRI | NULL    | auto_increment |
| Name         | varchar(50) | NO   |     | NULL    |                |
| AreaCode     | varchar(10) | NO   |     | NULL    |                |
+--------------+------------+------+-----+---------+----------------+
3 rows in set (0.01 sec)

mysql> DESCRIBE foodandbeverageitems;
+-------------+--------------+------+-----+---------+----------------+
| Field       | Type         | Null | Key | Default | Extra          |
+-------------+--------------+------+-----+---------+----------------+
| ItemID      | int          | NO   | PRI | NULL    | auto_increment |
| Name        | varchar(255) | NO   |     | NULL    |                |
```

```
| Description  | text          | YES  |     | NULL    |                |
| Price        | decimal(10,2) | NO   |     | NULL    |                |
| Category     | varchar(50)   | NO   |     | NULL    |                |
| Availability | tinyint(1)    | NO   |     | NULL    |                |
+--------------+---------------+------+-----+---------+----------------+
6 rows in set (0.01 sec)

mysql> DESCRIBE orderitems;
+-------------+---------------+------+-----+---------+----------------+
| Field       | Type          | Null | Key | Default | Extra          |
+-------------+---------------+------+-----+---------+----------------+
| OrderItemID | int           | NO   | PRI | NULL    | auto_increment |
| OrderID     | int           | NO   | MUL | NULL    |                |
| ItemID      | int           | NO   | MUL | NULL    |                |
| Quantity    | int           | NO   |     | NULL    |                |
| Subtotal    | decimal(10,2) | NO   |     | NULL    |                |
+-------------+---------------+------+-----+---------+----------------+
5 rows in set (0.01 sec)

mysql> DESCRIBE ORDERS;
+-----------------+---------------+------+-----+---------+----------------+
| Field           | Type          | Null | Key | Default | Extra          |
+-----------------+---------------+------+-----+---------+----------------+
| OrderID         | int           | NO   | PRI | NULL    | auto_increment |
| CustomerID      | int           | NO   | MUL | NULL    |                |
| OrderDate       | date          | YES  |     | NULL    |                |
| TotalAmount     | decimal(10,2) | NO   |     | NULL    |                |
| DeliveryAddress | text          | YES  |     | NULL    |                |
| OrderType       | varchar(10)   | NO   |     | NULL    |                |
+-----------------+---------------+------+-----+---------+----------------+
```

b) b) **Select specific rows and columns:** To select specific rows and columns from a table, we can use the **SELECT** statement. For example:

```
mysql> SELECT FirstName, LastName FROM Customers WHERE PremiumCustomer = 1;
+-----------+----------+
| FirstName | LastName |
+-----------+----------+
| John      | Doe      |
| Michael   | Johnson  |
+-----------+----------+
2 rows in set (0.01 sec)
```

c) **Apply search conditions with calculated fields:** we can apply search conditions with calculated fields in the **SELECT** statement. For example:

```
mysql> --Apply search conditions with calculated fields:
    -> SELECT FirstName, LastName, (DiscountPercentage * TotalAmount) AS DiscountAmount
    -> FROM Customers
    -> WHERE PremiumCustomer = 1;
```

d) **Use pattern search:** To use pattern search, you can use the **LIKE** operator with wildcard characters **%** and **_**. For example:

```
mysql> SELECT Name FROM FoodAndBeverageItems WHERE Name LIKE '%Cake%';
+-----------------+
| Name            |
+-----------------+
| Chocolate Cake  |
+-----------------+
1 row in set (0.00 sec)
```

e) **Select tuples based on ordering (multiple columns):** We can use the **ORDER BY** clause to select tuples based on ordering of multiple columns. For example:

```
mysql> SELECT FirstName, LastName
    -> FROM Customers
    -> ORDER BY LastName ASC, FirstName ASC;
+-----------+----------+
| FirstName | LastName |
+-----------+----------+
| John      | Doe      |
| Michael   | Johnson  |
| Jane      | Smith    |
+-----------+----------+
3 rows in set (0.00 sec)
```

f) **Use nested queries: We** can use subqueries (nested queries) within a SQL statement. For example:

```
mysql> SELECT FirstName, LastName
    -> FROM Customers
    -> WHERE CustomerID IN (SELECT CustomerID FROM Orders WHERE TotalAmount > 20);
+-----------+----------+
| FirstName | LastName |
+-----------+----------+
| John      | Doe      |
| Michael   | Johnson  |
+-----------+----------+
2 rows in set (0.04 sec)
```

g) **Use aggregated functions:** Aggregated functions like **`SUM`**, **`COUNT`**, **`AVG`**, etc., can be used to perform calculations on data. For example:

```
mysql> SELECT Category, AVG(Price) AS AvgPrice
    -> FROM FoodAndBeverageItems
    -> GROUP BY Category;
+-------------+-----------+
| Category    | AvgPrice  |
+-------------+-----------+
| Main Course | 12.990000 |
| Appetizer   |  7.990000 |
| Dessert     |  5.990000 |
| Beverage    |  2.490000 |
+-------------+-----------+
4 rows in set (0.05 sec)
```

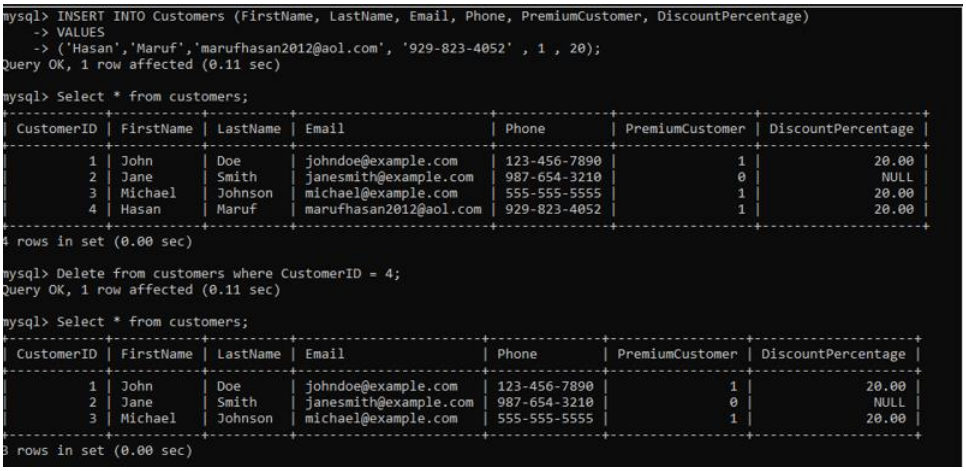
h) **Take multiple relations in a query:** we can use **`JOIN`** to retrieve data from multiple tables in a single query. For example:

```
mysql> SELECT Customers.FirstName, Orders.OrderDate
    -> FROM Customers
    -> JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
+-----------+------------+
| FirstName | OrderDate  |
+-----------+------------+
| John      | 2023-10-02 |
| Jane      | 2023-10-02 |
| Michael   | 2023-10-02 |
+-----------+------------+
3 rows in set (0.01 sec)
```

i) **Update specific columns and/or fields:** To update specific columns or fields in a table, we use the **`UPDATE`** statement. For example:

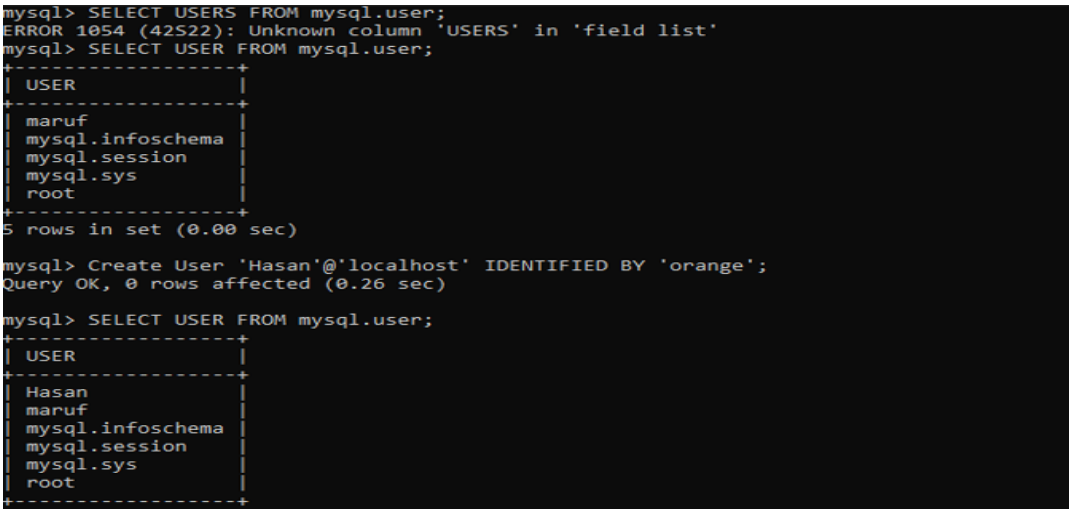
```
mysql> UPDATE Customers
    -> SET DiscountPercentage = 20
    -> WHERE PremiumCustomer = 1;
Query OK, 2 rows affected (0.11 sec)
Rows matched: 2  Changed: 2  Warnings: 0
```

j) **Drop specific columns and rows:** We can't directly drop specific columns using SQL. To drop columns, we typically need to recreate the table with the desired schema. To delete rows, we use the **`DELETE`** statement. For example:



```
mysql> INSERT INTO Customers (FirstName, LastName, Email, Phone, PremiumCustomer, DiscountPercentage)
    -> VALUES
    -> ('Hasan','Maruf','marufhasan2012@aol.com', '929-823-4052' , 1 , 20);
Query OK, 1 row affected (0.11 sec)

mysql> Select * from customers;
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
| CustomerID | FirstName | LastName | Email                | Phone        | PremiumCustomer | DiscountPercentage |
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
|          1 | John      | Doe      | johndoe@example.com  | 123-456-7890 |               1 |              20.00 |
|          2 | Jane      | Smith    | janesmith@example.com| 987-654-3210 |               0 |               NULL |
|          3 | Michael   | Johnson  | michael@example.com  | 555-555-5555 |               1 |              20.00 |
|          4 | Hasan     | Maruf    | marufhasan2012@aol.com| 929-823-4052 |               1 |              20.00 |
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
4 rows in set (0.00 sec)

mysql> Delete from customers where CustomerID = 4;
Query OK, 1 row affected (0.11 sec)

mysql> Select * from customers;
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
| CustomerID | FirstName | LastName | Email                | Phone        | PremiumCustomer | DiscountPercentage |
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
|          1 | John      | Doe      | johndoe@example.com  | 123-456-7890 |               1 |              20.00 |
|          2 | Jane      | Smith    | janesmith@example.com| 987-654-3210 |               0 |               NULL |
|          3 | Michael   | Johnson  | michael@example.com  | 555-555-5555 |               1 |              20.00 |
+------------+-----------+----------+----------------------+--------------+-----------------+--------------------+
3 rows in set (0.00 sec)
```

k) **Create users and provide different views:** User management and permissions are typically handled at the MySQL server level, not directly within SQL statements. we can create users and grant them specific permissions using SQL commands.

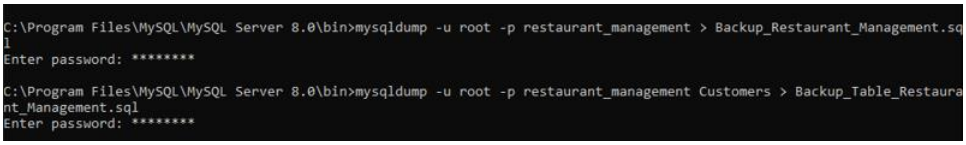


```
mysql> SELECT USERS FROM mysql.user;
ERROR 1054 (42S22): Unknown column 'USERS' in 'field list'
mysql> SELECT USER FROM mysql.user;
+------------------+
| USER             |
+------------------+
| maruf            |
| mysql.infoschema |
| mysql.session    |
| mysql.sys        |
| root             |
+------------------+
5 rows in set (0.00 sec)

mysql> Create User 'Hasan'@'localhost' IDENTIFIED BY 'orange';
Query OK, 0 rows affected (0.26 sec)

mysql> SELECT USER FROM mysql.user;
+------------------+
| USER             |
+------------------+
| Hasan            |
| maruf            |
| mysql.infoschema |
| mysql.session    |
| mysql.sys        |
| root             |
+------------------+
```

l) **Grant privileges (global and local) for specific users:** Granting privileges to users is typically done using MySQL's **`GRANT`** statement at the server level.

```
mysql> GRANT SELECT,INSERT ON restaurant_management.* TO 'Hasan'@'localhost';
Query OK, 0 rows affected (0.10 sec)

mysql>
```

m) **Backup the database :** To backup a database, you can use the **`mysqldump`** command or tools like phpMyAdmin. For example, to backup a database named "mydb," we can use:



n) **Import databases that have been already backed up:** To import a previously backed up database, we can use the **`mysql`** command or tools like phpMyAdmin. For example: