

## TASK 1 : Database Design :

### Q1. Create the database named "TechShop"

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Displays the SQL code used to create the database and switch to it:

```
93  
94  
95  
96  
97  
98  
99  
100  
101 • create database TechShop;  
102 • use TechShop;  
103  
104  
105 • create table Customers(  
106     CustomerID int primary key,  
107     FirstName text,  
108     LastName text,  
109     Email text,  
110     Phone int,  
111     Address text  
112 );  
113 • create table Products(  
114     ProductID int primary key,
```
- Output Window:** Shows the execution results:

| # | Time     | Action                   | Message           | Duration / Fetch |
|---|----------|--------------------------|-------------------|------------------|
| 1 | 10:56:34 | create database TechShop | 1 row(s) affected | 0.015 sec        |
| 2 | 10:56:34 | use TechShop             | 0 row(s) affected | 0.000 sec        |
- Navigator:** Shows the database structure with the 'Customers' table listed under the 'TechShop' database.

### Q2. Define the schema for the Customers, Products, Orders, OrderDetails and Inventory tables based on the provided schema.

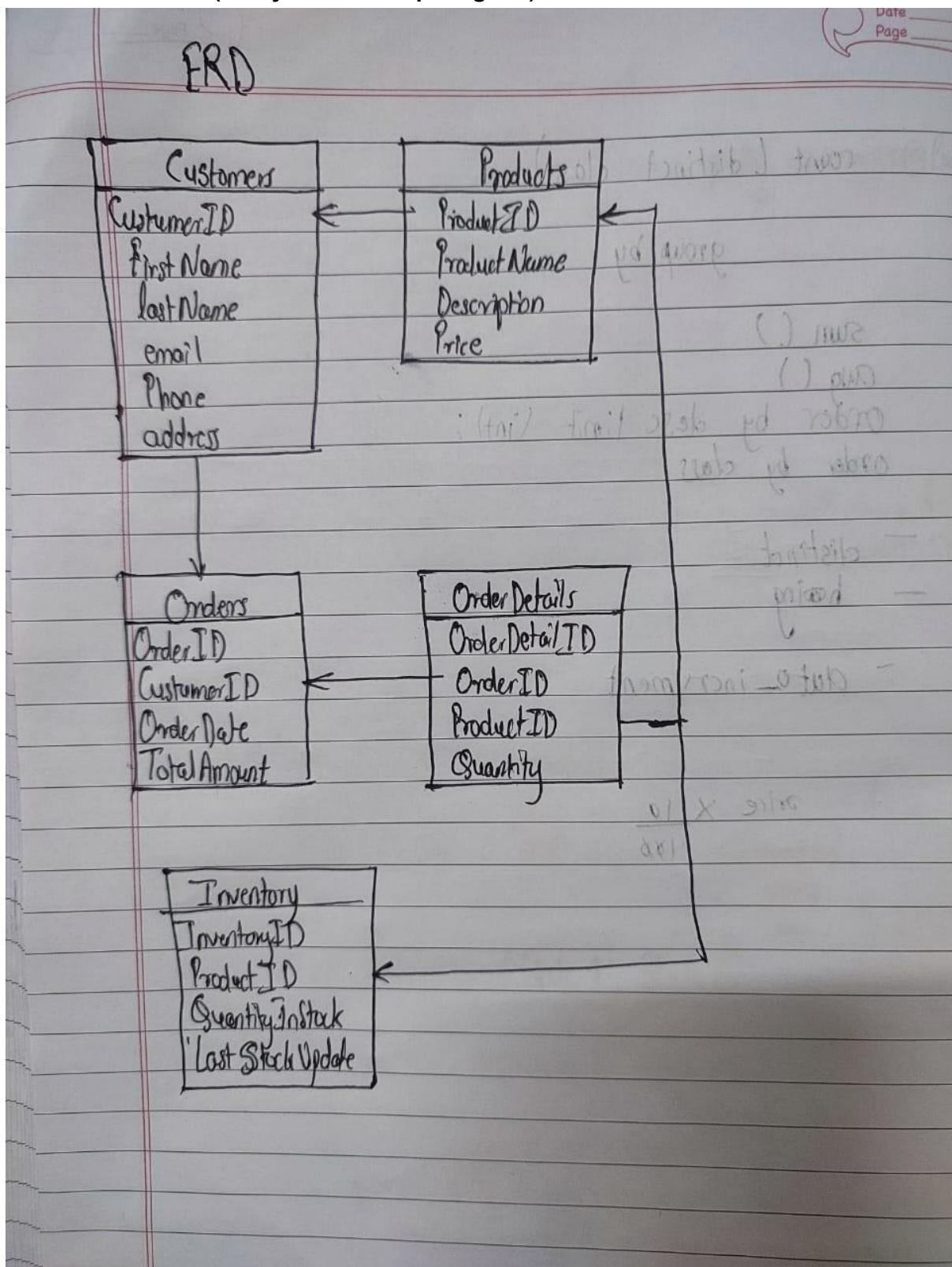
The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Displays the SQL code used to create multiple tables:

```
101 • create database TechShop;  
102 • use TechShop;  
103  
104  
105 • create table Customers(  
106     CustomerID int primary key,  
107     FirstName text,  
108     LastName text,  
109     Email text,  
110     Phone int,  
111     Address text  
112 );  
113 • create table Products(  
114     ProductID int primary key,  
115     ProductName text,  
116     Description text,  
117     Price int  
118 );  
119 • create table Orders(  
120     OrderID int primary key,  
121     CustomerID int,  
122     OrderDate datetime,  
123     TotalAmount int  
124 );  
125 • create table OrderDetails(  
126     OrderDetailID int primary key,  
127     OrderID int,  
128     ProductID int,  
129     Quantity int,  
130     Price float  
131 );  
132 • create table Inventory(  
133     InventoryID int primary key,  
134     ProductID int,  
135     QuantityInStock int,  
136     LastStockUpdate datetime  
137 );
```
- Output Window:** Shows the execution results:

| # | Time     | Action   | Message           | Duration / Fetch |
|---|----------|--|-------------------|------------------|
| 1 | 10:56:34 | create database TechShop   | 1 row(s) affected | 0.015 sec        |
| 2 | 10:56:34 | use TechShop   | 0 row(s) affected | 0.000 sec        |
| 3 | 10:57:27 | create table Customers(CustomerID int primary key, FirstName text, LastName text, Email text, Phone int, Address text) | 0 row(s) affected | 0.016 sec        |
| 4 | 10:57:27 | create table Products(ProductID int primary key, ProductName text, Description text, Price int)                        | 0 row(s) affected | 0.031 sec        |
| 5 | 10:57:27 | create table Orders(OrderID int primary key, CustomerID int, OrderDate datetime, TotalAmount int)                      | 0 row(s) affected | 0.016 sec        |
| 6 | 10:57:27 | create table OrderDetails(OrderDetailID int primary key, OrderID int, ProductID int, Quantity int, Price float)        | 0 row(s) affected | 0.031 sec        |
| 7 | 10:57:27 | create table Inventory(InventoryID int primary key, ProductID int, QuantityInStock int, LastStockUpdate datetime)      | 0 row(s) affected | 0.016 sec        |
- Navigator:** Shows the database structure with multiple tables listed under the 'TechShop' database.

Q3. Create an ERD (Entity Relationship Diagram) for the database.



#### Q4. Create appropriate Primary Key and Foreign Key constraints for referential integrity.

```

101 • create database TechShop;
102 • use TechShop;
103
104
105 • create table Customers(
106     CustomerID int primary key,
107     FirstName text,
108     LastName text,
109     Email text,
110     Phone int,
111     Address text
112 );
113 • create table Products(
114     ProductID int primary key,
115     ...

```

Action Output

| Time       | Action   | Message           | Duration / Fetch |
|------------|--|-------------------|------------------|
| 1 10:56:34 | create database TechShop   | 1 row(s) affected | 0.015 sec        |
| 2 10:56:34 | use TechShop   | 0 row(s) affected | 0.000 sec        |
| 3 10:57:27 | create table Customers(CustomerID int primary key, FirstName text, LastName text, Email text, Phone int, Address text)   | 0 row(s) affected | 0.016 sec        |
| 4 10:57:27 | create table Products(ProductID int primary key, ProductName text, Description text, Price int)  | 0 row(s) affected | 0.031 sec        |
| 5 10:57:27 | create table OrderDetail(OrderDetailID int, CustomerID int, OrderDate datetime, TotalAmount int, primary key(OrderDetailID), foreign key(CustomerID) references Customers(CustomerID))                                     | 0 row(s) affected | 0.016 sec        |
| 6 10:57:27 | create table OrderDetails(OrderDetailID int, OrderID int, ProductID int, Quantity int, primary key(OrderDetailID), foreign key(OrderID) references Orders(OrderID), foreign key(ProductID) references Products(ProductID)) | 0 row(s) affected | 0.031 sec        |
| 7 10:57:27 | create table Inventory(InventoryID int, ProductID int, QuantityInStock int, LastStockUpdate datetime)  | 0 row(s) affected | 0.016 sec        |

#### Q5. Insert at least 10 sample records into each of the following tables.

a. Customers b. Products c. Orders d. OrderDetails e. Inventory

```

162 (2, 'Smartphone', 'Latest smartphone model', 500),
163 (3, 'Headphones', 'Noise-cancelling headphones', 150),
164 (4, 'Tablet', 'Android tablet with HD display', 300),
165 (5, 'Camera', 'DSLR camera with 24MP resolution', 800),
166 (6, 'Smartwatch', 'Fitness tracker and smartwatch', 200),
167 (7, 'Printer', 'Wireless color printer', 250),
168 (8, 'External Hard Drive', '2TB USB 3.0 external hard drive', 120),
169 (9, 'Wireless Mouse', 'Ergonomic wireless mouse', 30),
170 (10, 'Gaming Console', 'Latest gaming console model', 400);

172 • INSERT INTO Orders (OrderID, CustomerID, OrderDate, TotalAmount)
VALUES
173 (1, 1, '2023-01-15 10:30:00', 1500),
174 (2, 2, '2023-02-20 14:45:00', 800),
175 ...

```

Action Output

| Time       | Action  | Message  | Duration / Fetch |
|------------|---|--|------------------|
| 1 11:41:55 | INSERT INTO Customers (CustomerID, FirstName, LastName, Email, Phone, Address) VALUES (1, 'John', 'Doe', 'john.doe@example.com', '123-456-7890', '123 Main St, Anytown, USA')   | 10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0 | 0.000 sec        |
| 2 11:41:55 | INSERT INTO Products (ProductID, ProductName, Description, Price) VALUES (1, 'Laptop', 'High-performance laptop', 1500), (2, 'Smartphone', 'Latest smartphone model', 500), (3, 'Headphones', 'Noise-cancelling headphones', 150), (4, 'Tablet', 'Android tablet with HD display', 300), (5, 'Camera', 'DSLR camera with 24MP resolution', 800), (6, 'Smartwatch', 'Fitness tracker and smartwatch', 200), (7, 'Printer', 'Wireless color printer', 250), (8, 'External Hard Drive', '2TB USB 3.0 external hard drive', 120), (9, 'Wireless Mouse', 'Ergonomic wireless mouse', 30), (10, 'Gaming Console', 'Latest gaming console model', 400) | 10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0 | 0.000 sec        |
| 3 11:41:55 | INSERT INTO Orders (OrderID, CustomerID, OrderDate, TotalAmount) VALUES (1, 1, '2023-01-15 10:30:00', 1500), (2, 2, '2023-02-20 14:45:00', 800)   | 10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0 | 0.019 sec        |
| 4 11:41:55 | INSERT INTO OrderDetails (OrderDetailID, OrderID, ProductID, Quantity) VALUES (1, 1, 1, 2), (2, 1, 2, 1), (3, 1, 3, 1), (4, 1, 4, 1), (5, 1, 5, 1), (6, 1, 6, 1), (7, 1, 7, 1), (8, 1, 8, 1), (9, 1, 9, 1), (10, 1, 10, 1)  | 10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0 | 0.000 sec        |
| 5 11:41:55 | INSERT INTO Inventory (InventoryID, ProductID, QuantityInStock, LastStockUpdate) VALUES (1, 1, 20, '2023-01-01 09:00:00')   | 10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0 | 0.000 sec        |

## TASK 2: Select, Where, Between, AND, LIKE :

### Q1. Write an SQL query to retrieve the names and emails of all customers.

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Contains the SQL command: `select * from Customers;`
- Result Grid:** Displays the data from the Customers table, showing 10 rows of customer information.
- Output Panel:** Shows the execution log with 6 entries, all completed successfully in 0.000 sec.
- System Bar:** Shows the date and time as 12/10/2023 11:43 AM.

| CustomerID | FirstName | LastName | Email                | Phone      | Address             |
|------------|-----------|----------|----------------------|------------|---------------------|
| 1          | John      | Doe      | john.doe@email.com   | 1234567890 | 123 Main Street     |
| 2          | Jane      | Smith    | jane.smith@email.com | 9876543210 | 456 Oak Avenue      |
| 3          | Robert    | Johnson  | robert.j@email.com   | 5551112233 | 789 Pine Lane       |
| 4          | Sarah     | Miller   | sarah.m@email.com    | 4445556666 | 101 Maple Drive     |
| 5          | Michael   | Davis    | michael.d@email.com  | 7778889999 | 202 Elm Street      |
| 6          | Emily     | Brown    | emily.b@email.com    | 6667778888 | 301 Cedar Road      |
| 7          | William   | White    | william.w@email.com  | 2344445555 | 457 Birch Lane      |
| 8          | Olivia    | Lee      | olivia.l@email.com   | 2223334444 | 598 Oak Street      |
| 9          | James     | Taylor   | james.t@email.com    | 1112223333 | 606 Pine Avenue     |
| 10         | Emma      | Wilson   | emma.w@email.com     | 9998887777 | 707 Maple Boulevard |

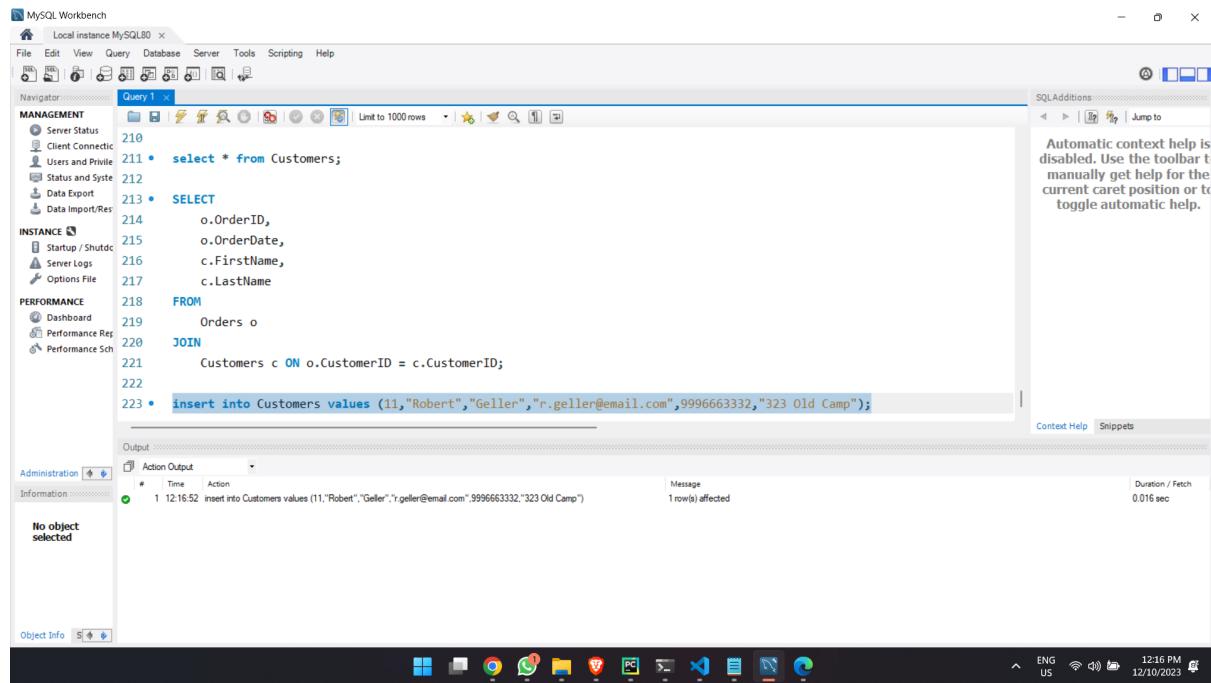
### Q2. Write an SQL query to list all orders with their order dates and corresponding customer names.

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Contains the SQL command: `SELECT * FROM Orders o JOIN Customers c ON o.CustomerID = c.CustomerID;`
- Result Grid:** Displays the joined data from the Orders and Customers tables, showing 10 rows of order information with corresponding customer names.
- Output Panel:** Shows the execution log with 7 entries, all completed successfully in 0.000 sec.
- System Bar:** Shows the date and time as 12/10/2023 12:11 PM.

| OrderID | OrderDate           | FirstName | LastName |
|---------|---------------------|-----------|----------|
| 1       | 2023-01-15 10:30:00 | John      | Doe      |
| 2       | 2023-02-20 14:45:00 | Jane      | Smith    |
| 3       | 2023-03-05 09:15:00 | Robert    | Johnson  |
| 4       | 2023-04-12 12:00:00 | Sarah     | Miller   |
| 5       | 2023-05-18 16:30:00 | Michael   | Davis    |
| 6       | 2023-06-25 11:45:00 | Emily     | Brown    |
| 7       | 2023-07-02 08:00:00 | William   | White    |
| 8       | 2023-08-19 14:20:00 | Olivia    | Lee      |
| 9       | 2023-09-24 09:30:00 | James     | Taylor   |
| 10      | 2023-10-30 15:00:00 | Emma      | Wilson   |

**Q3. Write an SQL query to insert a new customer record into the "Customers" table. Include customer information such as name, email, and address.**



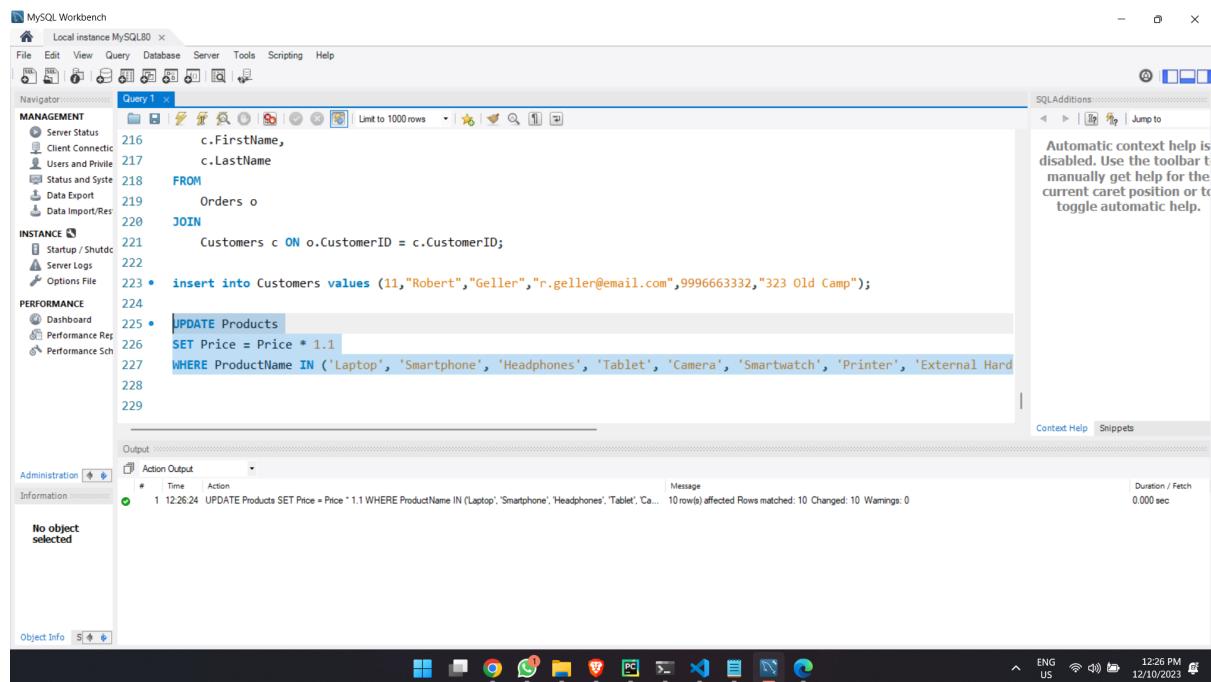
The screenshot shows the MySQL Workbench interface with a query editor window titled 'Query 1'. The code entered is:

```
210
211 •  select * from Customers;
212
213 •  SELECT
214     o.OrderID,
215     o.OrderDate,
216     c.FirstName,
217     c.LastName
218   FROM
219     Orders o
220   JOIN
221     Customers c ON o.CustomerID = c.CustomerID;
222
223 •  insert into Customers values (11,"Robert","Geller","r.geller@email.com",9996663332,"323 Old Camp");
```

The output pane shows the result of the insertion:

| Action   | Time       | Message           | Duration / Fetch |
|--|------------|-------------------|------------------|
| insert into Customers values (11,"Robert","Geller","r.geller@email.com",9996663332,"323 Old Camp") | 1 12:16:52 | 1 row(s) affected | 0.016 sec        |

**Q4. Write an SQL query to update the prices of all electronic gadgets in the "Products" table by increasing them by 10%.**



The screenshot shows the MySQL Workbench interface with a query editor window titled 'Query 1'. The code entered is:

```
216
217   c.FirstName,
218   c.LastName
219   FROM
220     Orders o
221   JOIN
222     Customers c ON o.CustomerID = c.CustomerID;
223
224
225 •  UPDATE Products
226   SET Price = Price * 1.1
227   WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Camera', 'Smartwatch', 'Printer', 'External Hard
228
229
```

The output pane shows the result of the update:

| Action   | Time       | Message   | Duration / Fetch |
|--|------------|---|------------------|
| UPDATE Products SET Price = Price * 1.1 WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Ca...') | 1 12:26:24 | 10 row(s) affected Rows matched: 10 Changed: 10 Warnings: 0 | 0.000 sec        |

**Q5. Write an SQL query to delete a specific order and its associated order details from the "Orders" and "OrderDetails" tables. Allow users to input the order ID as a parameter.**

```

MySQL Workbench - Local instance MySQL80 x
File Edit View Query Database Server Tools Scripting Help
Navigator: Query 1 SQLAdditions: Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

MANAGEMENT
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216     c.FirstName,
217     c.LastName
218   FROM
219   Orders o
220   JOIN
221     Customers c ON o.CustomerID = c.CustomerID;
222
223 • insert into Customers values (11,"Robert","Geller","r.geller@email.com",9996663332,"323 Old Camp");
224
225 • UPDATE Products
226   SET Price = Price * 1.1
227   WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Camera', 'Smartwatch', 'Printer', 'External Hard
228
229 • delete from Orders where OrderID = 7;

Output
Action Output
# Time Action Message Duration / Fetch
1 12:26:24 UPDATE Products SET Price = Price * 1.1 WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Ca... 0.000 sec
2 12:30:38 delete from Orders where OrderID = 7 Error Code: 1451. Cannot delete or update a parent row: a foreign key constraint fails (techshop`.`orderdetails`,CONSTRA... 0.016 sec
3 12:32:06 delete from OrderDetails where OrderID = 7 1 row(s) affected 0.019 sec
4 12:32:15 delete from Orders where OrderID = 7 1 row(s) affected 0.016 sec

Object Info
12:32 PM 12/10/2023

```

**Q6. Write an SQL query to insert a new order into the "Orders" table. Include the customer ID, order date, and any other necessary information.**

```

MySQL Workbench - Local instance MySQL80 x
File Edit View Query Database Server Tools Scripting Help
Navigator: Query 1 SQLAdditions: Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

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216     c.FirstName,
217     c.LastName
218   FROM
219   Orders o
220   JOIN
221     Customers c ON o.CustomerID = c.CustomerID;
222
223 • insert into Customers values (11,"Robert","Geller","r.geller@email.com",9996663332,"323 Old Camp");
224
225 • UPDATE Products
226   SET Price = Price * 1.1
227   WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Camera', 'Smartwatch', 'Printer', 'External Hard
228
229 • delete from Orders where OrderID = 7;
230
231 • INSERT INTO Orders
232   VALUES(
233     7, '2023-07-02 08:00:00', 450
234   );

Output
Action Output
# Time Action Message Duration / Fetch
1 12:26:24 UPDATE Products SET Price = Price * 1.1 WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Ca... 0.000 sec
2 12:30:38 delete from Orders where OrderID = 7 Error Code: 1451. Cannot delete or update a parent row: a foreign key constraint fails (techshop`.`orderdetails`,CONSTRA... 0.016 sec
3 12:32:06 delete from OrderDetails where OrderID = 7 1 row(s) affected 0.019 sec
4 12:32:15 delete from Orders where OrderID = 7 1 row(s) affected 0.016 sec
5 12:49:18 INSERT INTO Orders VALUES(7, 7, '2023-07-02 08:00:00', 450) 1 row(s) affected 0.046 sec

Object Info
12:49 PM 12/10/2023

```

**Q7. Write an SQL query to update the contact information (e.g., email and address) of a specific customer in the "Customers" table. Allow users to input the customer ID and new contact information.**

```

MySQL Workbench
Local instance MySQL80 x
File Edit View Query Database Server Tools Scripting Help
Navigator: Query1 x
MANAGEMENT
    Server Status
    Client Connectic
    Users and Privile
    Status and Syste
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PERFORMANCE
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Administration
Information
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Output
Action Output
# Time Action Message Duration / Fetch
1 12:26:24 UPDATE Products SET Price = Price * 1.1 WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Ca... 10 row(s) affected Rows matched: 10 Changed: 10 Warnings: 0 0.000 sec
2 12:30:38 delete from Orders where OrderID = 7 Error Code: 1451. Cannot delete or update a parent row: a foreign key constraint fails ('techshop','orderdetails',CONSTRA... 1 row(s) affected 0.016 sec
3 12:32:06 delete from OrderDetails where OrderID = 7 1 row(s) affected 0.015 sec
4 12:32:15 delete from Orders where OrderID = 7 1 row(s) affected 0.016 sec
5 12:49:18 INSERT INTO Orders VALUES(7, 7, '2023-07-02 08:00:00', 450) 1 row(s) affected 0.046 sec
6 12:53:49 UPDATE Customers SET Email = 'jane.s@email.com', Address = '457 Oak Avenue' WHERE CustomerID = 2 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0 0.047 sec
12:53 PM 12/10/2023

```

**Q8. Write an SQL query to recalculate and update the total cost of each order in the "Orders" table based on the prices and quantities in the "OrderDetails" table.**

```

MySQL Workbench
Local instance MySQL80 x
File Edit View Query Database Server Tools Scripting Help
Navigator: Query1 x
MANAGEMENT
    Server Status
    Client Connectic
    Users and Privile
    Status and Syste
    Data Export
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INSTANCE
    Startup / Shutdc
    Server Logs
    Options File
PERFORMANCE
    Dashboard
    Performance Rep
    Performance Sch
Administration
Information
No object selected
Object Info S
Output
Action Output
# Time Action Message Duration / Fetch
3 12:15:10 desc Orders 4 row(s) returned 0.000 sec / 0.000 sec
4 12:23:47 UPDATE Orders o SET o.TotalAmount = (select od.productID from OrderDetails od where o.orderID = od.OrderID) * (select p.price from Produ... Error Code: 1054. Unknown column 'o.productID' in 'field list' 0.015 sec
5 12:26:06 UPDATE Orders o SET o.TotalAmount = (select od.productID from OrderDetails od where o.orderID = od.OrderID) * (select p.price from Produ... Error Code: 1054. Unknown column 'od.ProductID' in 'where clause' 0.000 sec
6 12:29:39 UPDATE Orders o SET o.TotalAmount = ( SELECT SUM(od.Quantity * p.price) FROM OrderDetails od JOIN Products p ON od.ProductID = p.ProductID WHERE od.OrderID = o.OrderID ) 9 row(s) affected Rows matched: 9 Changed: 9 Warnings: 0 0.015 sec
7 12:30:04 select * from Orders LIMIT 0,1000 9 row(s) returned 0.000 sec / 0.000 sec
12:35 PM 12/11/2023

```

**Q9. Write an SQL query to delete all orders and their associated order details for a specific customer from the "Orders" and "OrderDetails" tables. Allow users to input the customer ID as a parameter.**

```

MySQL Workbench
Local instance MySQL80 x
File Edit View Query Database Server Tools Scripting Help
Navigator: Query 1
MANAGEMENT
    Server Status
    Client Connectic
    Users and Privile
    Status and Syste
    Data Export
    Data Import/Res
INSTANCE
    Startup / Shutdo
    Server Logs
    Options File
PERFORMANCE
    Dashboard
    Performance Rep
    Performance Sch
Administration
Information
No object selected
Object Info S
SQLAdditions
Automatic context help is disabled. Use the toolbar manually get help for the current caret position or to toggle automatic help.

Query 1
234  );
235
236 • UPDATE Customers
237     SET
238         Email = 'jane.s@email.com',
239         Address = '457 Oak Avenue'
240     WHERE
241         CustomerID = 2;
242
243 • DELETE FROM OrderDetails
244     WHERE OrderID IN (SELECT OrderID FROM Orders WHERE CustomerID = 7);
245
246 • DELETE FROM Orders
247     WHERE CustomerID = 7;

Output
Action Output
# Time Action Message Duration / Fetch
1 12:26:24 UPDATE Products SET Price = Price * 1.1 WHERE ProductName IN ('Laptop', 'Smartphone', 'Headphones', 'Tablet', 'Ca... 10 row(s) affected Rows matched: 10 Changed: 10 Warnings: 0 0.000 sec
2 12:30:38 delete from Orders where OrderID = 7 Err Code: 1451. Cannot delete or update a parent row: a foreign key constraint fails ('techshop','orderdetails',CONSTRA... 1 row(s) affected 0.016 sec
3 12:32:06 delete from OrderDetails where OrderID = 7 1 row(s) affected 0.015 sec
4 12:32:15 delete from Orders where OrderID = 7 1 row(s) affected 0.016 sec
5 12:49:18 INSERT INTO Orders VALUES(7, 7, 2023-07-02 08:00:00, 450) 1 row(s) affected 0.046 sec
6 12:53:49 UPDATE Customers SET Email = 'jane.s@email.com', Address = '457 Oak Avenue' WHERE CustomerID = 2 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0 0.047 sec
7 13:00:32 DELETE FROM OrderDetails WHERE OrderID IN (SELECT OrderID FROM Orders WHERE CustomerID = 7) 0 row(s) affected 0.047 sec
8 13:00:57 DELETE FROM Orders WHERE CustomerID = 7 1 row(s) affected 0.046 sec

10:01 PM 12/10/2023
ENG US

```

**Q10. Write an SQL query to insert a new electronic gadget product into the "Products" table, including product name, category, price, and any other relevant details.**

```

MySQL Workbench
Local instance MySQL80 x
File Edit View Query Database Server Tools Scripting Help
Navigator: Query 1
MANAGEMENT
    Server Status
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Administration
Information
No object selected
Object Info S
SQLAdditions
Automatic context help is disabled. Use the toolbar manually get help for the current caret position or to toggle automatic help.

Query 1
238     Email = 'jane.s@email.com',
239     Address = '457 Oak Avenue'
240     WHERE
241         CustomerID = 2;
242
243 • DELETE FROM OrderDetails
244     WHERE OrderID IN (SELECT OrderID FROM Orders WHERE CustomerID = 7);
245
246 • DELETE FROM Orders
247     WHERE CustomerID = 7;
248
249 • INSERT INTO Products
250     VALUES(11, 'Pendrive', 'Type-C Pendrive with 64GB Storage', 20);
251

Output
Action Output
# Time Action Message Duration / Fetch
1 13:04:18 INSERT INTO Products VALUES(11,'Pendrive','Type-C Pendrive with 64GB Storage',20) 1 row(s) affected 0.046 sec

10:04 PM 12/10/2023
ENG US

```

**Q11. Write an SQL query to update the status of a specific order in the "Orders" table (e.g., from "Pending" to "Shipped"). Allow users to input the order ID and the new status.**

The screenshot shows the MySQL Workbench interface with a query editor containing the following SQL code:

```

243 • DELETE FROM OrderDetails
244 WHERE OrderID IN (SELECT OrderID FROM Orders WHERE CustomerID = 7);
245
246 • DELETE FROM Orders
247 WHERE CustomerID = 7;
248
249 • INSERT INTO Products
250 VALUES(11,'Pendrive','Type-C Pendrive with 64GB Storage',20);
251
252 • UPDATE Orders
253 SET TotalAmount = 500
254 WHERE OrderID = 9;
255

```

The output pane shows two log entries:

- Action: INSERT INTO Products VALUES(11,'Pendrive','Type-C Pendrive with 64GB Storage',20) - Message: 1 row(s) affected - Duration / Fetch: 0.046 sec
- Action: UPDATE Orders SET TotalAmount = 500 WHERE OrderID = 9 - Message: 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0 - Duration / Fetch: 0.047 sec

**Q12. Write an SQL query to calculate and update the number of orders placed by each customer in the "Customers" table based on the data in the "Orders" table.**

The screenshot shows the MySQL Workbench interface with a query editor containing the following SQL code:

```

258
259 • UPDATE Customers
260 SET NumberOfOrders =
261   (SELECT COUNT(*)
262    FROM Orders
263    WHERE Customers.CustomerID = Orders.CustomerID
264 );

```

The results grid displays the updated data in the Customers table:

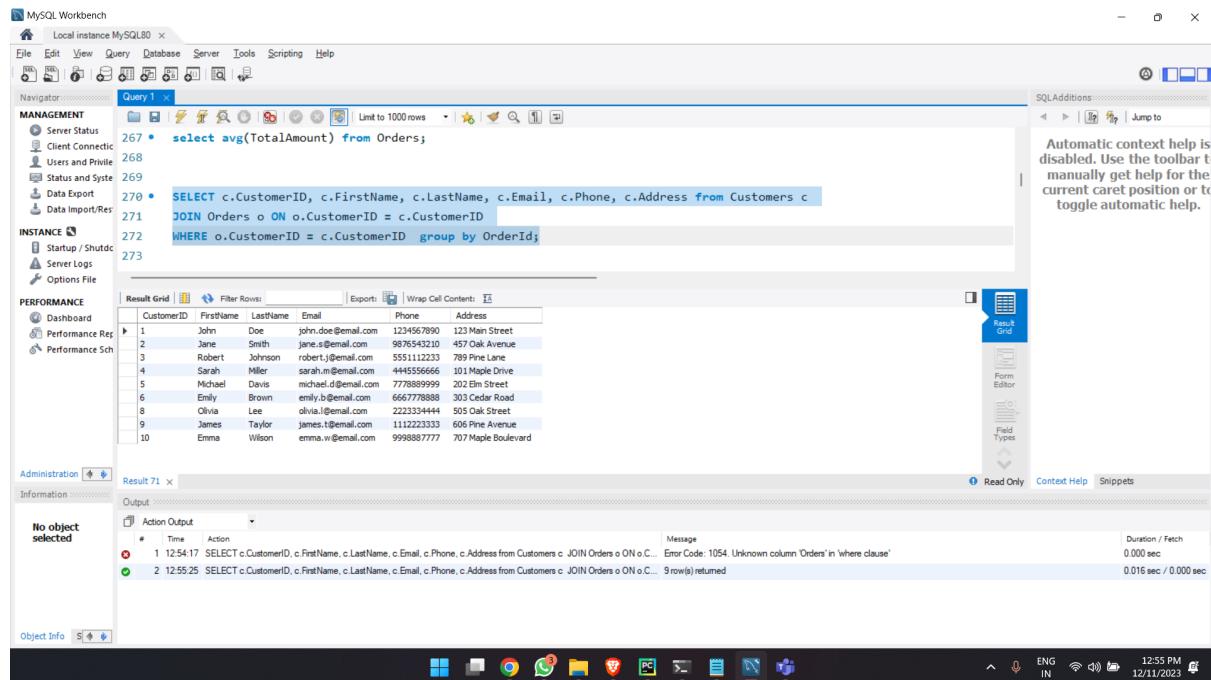
| CustomerID | FirstName | LastName | Email                | Phone      | Address             | NumberOfOrders |
|------------|-----------|----------|----------------------|------------|---------------------|----------------|
| 1          | John      | Doe      | john.doe@email.com   | 1234567890 | 123 Main Street     | 1              |
| 2          | Jane      | Smith    | jane.smith@email.com | 9876543210 | 456 Oak Avenue      | 1              |
| 3          | Robert    | Johnson  | robert.j@email.com   | 5551123233 | 789 Pine Lane       | 1              |
| 4          | Sarah     | Miller   | sarah.m@email.com    | 4445566666 | 101 Maple Drive     | 1              |
| 5          | Michael   | Davis    | michael.d@email.com  | 7778899999 | 202 Elm Street      | 1              |
| 6          | Emily     | Brown    | emily.b@email.com    | 6667788888 | 303 Cedar Road      | 1              |
| 7          | William   | White    | william.w@email.com  | 3334455555 | 404 Birch Lane      | 0              |
| 8          | Olivia    | Lee      | olivia.l@email.com   | 2223344444 | 505 Oak Street      | 1              |
| 9          | James     | Taylor   | james.t@email.com    | 1112223333 | 606 Pine Avenue     | 1              |
| 10         | Emma      | Wilson   | emma.w@email.com     | 9998877777 | 707 Maple Boulevard | 1              |

The output pane shows the log entries for the execution of the script:

- Action: INSERT INTO Products VALUES(11,'Pendrive','Type-C Pendrive with 64GB Storage',20) - Message: 1 row(s) affected - Duration / Fetch: 0.046 sec
- Action: UPDATE Orders SET TotalAmount = 500 WHERE OrderID = 9 - Message: 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0 - Duration / Fetch: 0.047 sec
- Action: SET NumberOfOrders = ( SELECT COUNT(\*) FROM Orders WHERE Customers.CustomerID = Orders.CustomerID ) - Error Code: 1193. Unknown system variable 'NumberOfOrders' - Duration / Fetch: 0.031 sec
- Action: ALTER TABLE Customers ADD NumberOfOrders int - Message: 0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0 - Duration / Fetch: 0.078 sec
- Action: UPDATE Customers SET NumberOfOrders = ( SELECT COUNT(\*) FROM Orders WHERE Customers.CustomerID = Orders.CustomerID ) - Message: 11 row(s) affected Rows matched: 11 Changed: 11 Warnings: 0 - Duration / Fetch: 0.000 sec
- Action: select \* from Customers LIMIT 0, 1000 - Message: 11 row(s) returned - Duration / Fetch: 0.000 sec / 0.000 sec

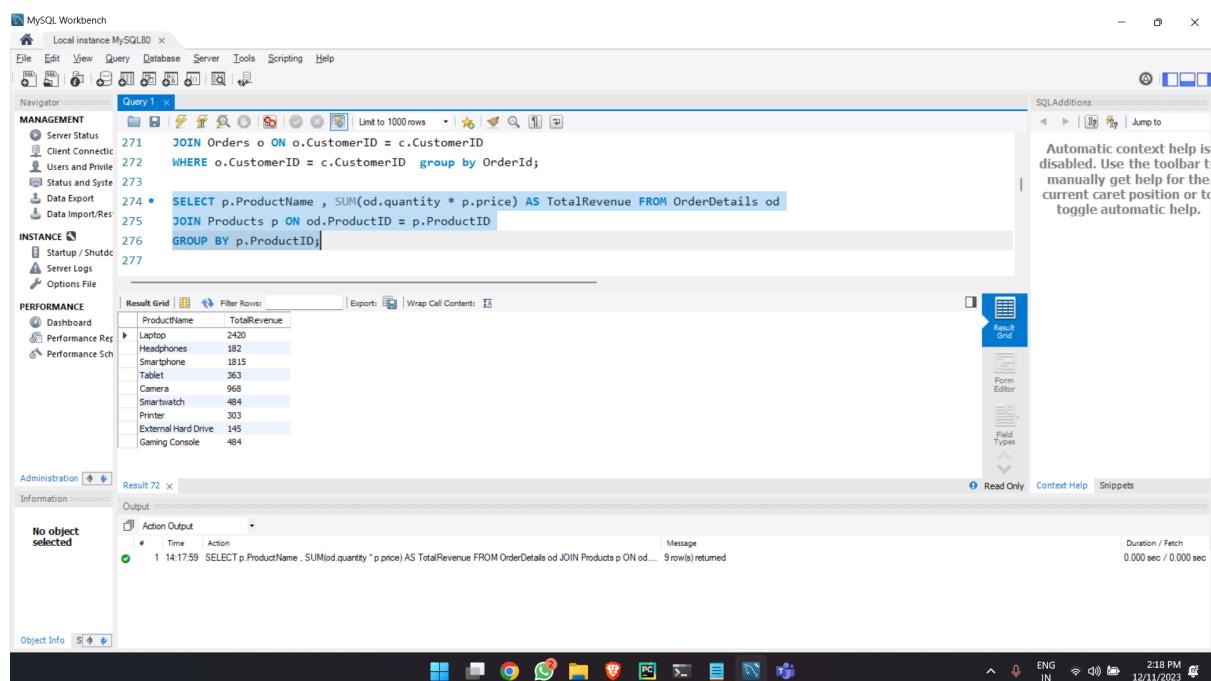
## TASK 4 : Aggregate functions, Having, Order By, GroupBy and Joins:

**Q1. Write an SQL query to retrieve a list of all orders along with customer information (e.g., customer name) for each order.**



```
MySQL Workbench - Local instance MySQL80
File Edit View Query Database Server Tools Scripting Help
Navigator: Query 1
MANAGEMENT
    Server Status
    Client Connect
    Users and Privileges
    Status and System
    Data Export
    Data Import/Res
INSTANCE
    Startup / Shutdown
    Server Logs
    Options File
PERFORMANCE
    Dashboard
    Performance Rep
    Performance Sch
Administration
Information
No object selected
Object Info S
Result 71
Output
Action Output
# Time Action
1 12:54:17 SELECT c.CustomerID, c.FirstName, c.LastName, c.Email, c.Phone, c.Address from Customers c JOIN Orders o ON o.CustomerID = c.CustomerID WHERE o.CustomerID = c.CustomerID group by OrderId;
2 12:55:25 SELECT c.CustomerID, c.FirstName, c.LastName, c.Email, c.Phone, c.Address from Customers c JOIN Orders o ON o.CustomerID = c.CustomerID WHERE o.CustomerID = c.CustomerID group by OrderId;
Result Grid | Filter Rows: | Export: | Wrap Cell Content: 
CustomerID FirstName LastName Email Phone Address
1 John Doe john.doe@email.com 1234567890 123 Main Street
2 Jane Smith jane.s@email.com 9876543210 457 Oak Avenue
3 Robert Johnson robert.j@email.com 555112233 789 Pine Lane
4 Sarah Miller sarah.m@email.com 4445556666 101 Maple Drive
5 Michael Davis michael.d@email.com 7778899999 202 Elm Street
6 Emily Brown emily.b@email.com 6667788888 303 Cedar Road
7 Olivia Lee olivia.l@email.com 2223344444 505 Oak Street
8 James Taylor james.t@email.com 1112223333 606 Pine Avenue
9 Emma Wilson emma.w@email.com 9998877777 707 Maple Boulevard
SQLAdditions
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.
Result 71
Read Only Context Help Snippets
Duration / Fetch: 0.000 sec / 0.016 sec / 0.000 sec
12:55 PM 12/11/2023
```

**Q2. Write an SQL query to find the total revenue generated by each electronic gadget product. Include the product name and the total revenue**



```
MySQL Workbench - Local instance MySQL80
File Edit View Query Database Server Tools Scripting Help
Navigator: Query 1
MANAGEMENT
    Server Status
    Client Connect
    Users and Privileges
    Status and System
    Data Export
    Data Import/Res
INSTANCE
    Startup / Shutdown
    Server Logs
    Options File
PERFORMANCE
    Dashboard
    Performance Rep
    Performance Sch
Administration
Information
No object selected
Object Info S
Result 72
Output
Action Output
# Time Action
1 14:17:59 SELECT p.ProductName , SUM(od.quantity * p.price) AS TotalRevenue FROM OrderDetails od JOIN Products p ON od.ProductID = p.ProductID GROUP BY p.ProductID;
Result Grid | Filter Rows: | Export: | Wrap Cell Content: 
ProductName TotalRevenue
Laptop 2420
Headphones 182
Smartphone 1915
Tablet 363
Camera 968
Smartwatch 484
Printer 303
External Hard Drive 145
Gaming Console 484
SQLAdditions
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.
Result 72
Read Only Context Help Snippets
Duration / Fetch: 0.000 sec / 0.000 sec
14:17:59 12/11/2023
```

### Q3. Write an SQL query to calculate the total revenue generated by TechShop.

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Displays the following SQL code:

```
261
262     SELECT COUNT(*)
263     FROM Orders
264     WHERE Customers.CustomerID = Orders.CustomerID
265   );
266 •  select sum(TotalAmount) from Orders;
```
- Result Grid:** Shows the result of the query: `6050`.
- Output Window:** Shows the action log with the following entries:

| # | Time     | Action   | Message   | Duration / Fetch      |
|---|----------|--|---|-----------------------|
| 1 | 13:04:18 | INSERT INTO Products VALUES(11,'Pending','Type-C Pendrive with 64GB Storage',20)                                     | 1 row(s) affected   | 0.046 sec             |
| 2 | 13:17:16 | UPDATE Orders SET TotalAmount = 500 WHERE OrderID = 9  | 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0    | 0.047 sec             |
| 3 | 13:19:15 | SET NumberOfOrders = ( SELECT COUNT(*) FROM Orders WHERE Customers.CustomerID = Orders.CustomerID )                  | Error Code: 1193. Unknown system variable 'NumberOfOrders'  | 0.031 sec             |
| 4 | 13:36:00 | ALTER TABLE Customers ADD NumberOfOrders int   | 0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0      | 0.078 sec             |
| 5 | 13:36:00 | UPDATE Customers SET NumberOfOrders = ( SELECT COUNT(*) FROM Orders WHERE Customers.CustomerID = Orders.CustomerID ) | 11 row(s) affected Rows matched: 11 Changed: 11 Warnings: 0 | 0.000 sec             |
| 6 | 13:36:19 | select * from Customers LIMIT 0, 1000  | 11 row(s) returned  | 0.000 sec / 0.000 sec |
| 7 | 13:39:46 | select sum(TotalAmount) from Orders LIMIT 0, 1000  | 1 row(s) returned   | 0.000 sec / 0.000 sec |

### Q4. Write an SQL query to calculate the average quantity ordered for products in a specific category. Allow users to input the category name as a parameter.

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Displays the following SQL code:

```
283
284     JOIN
285         Products p ON od.ProductID = p.ProductID
286
287     WHERE
288         p.ProductName = 'Tablet';
```
- Result Grid:** Shows the result of the query: `1.0000`.
- Output Window:** Shows the action log with the following entries:

| # | Time     | Action   | Message   | Duration / Fetch      |
|---|----------|--|---|-----------------------|
| 1 | 14:50:54 | SELECT AVG(od.Quantity) AS AverageQuantityOrdered FROM OrderDetails od JOIN Products p ON od.ProductID = p.ProductID WHERE p.ProductName = 'Tablet'; | Error Code: 1146. Table 'techshop.categories' doesn't exist | 0.031 sec             |
| 2 | 14:52:42 | SELECT AVG(od.Quantity) AS AverageQuantityOrdered FROM OrderDetails od JOIN Products p ON od.ProductID = p.ProductID WHERE p.ProductName = 'Tablet'; | 1 row(s) returned   | 0.000 sec / 0.000 sec |

**Q5. Write an SQL query to calculate the total revenue generated by a specific customer. Allow users to input the customer ID as a parameter.**

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Displays the following SQL code:
 

```

286     p.ProductName = 'Tablet';
287
288 •   SELECT c.CustomerID, c.FirstName, c.LastName, SUM(o.TotalAmount * od.Quantity) AS TotalRevenue
289     FROM Customers c
290     JOIN Orders o ON c.CustomerID = o.CustomerID
291     JOIN OrderDetails od ON o.OrderID = od.OrderID
292     WHERE c.CustomerID = 5;
      
```
- Result Grid:** Shows the output of the query:
 

| CustomerID | FirstName | LastName | TotalRevenue |
|------------|-----------|----------|--------------|
| 5          | Michael   | Davis    | 303          |
- Output Window:** Shows the execution log with the following entries:
 

| # | Time     | Action   | Message   | Duration / Fetch      |
|---|----------|--|---|-----------------------|
| 3 | 15:04:41 | SELECT c.CustomerID, c.FirstName, c.LastName FROM Customers c JOIN OrderDetails od ON o.OrderID = od.OrderID WHERE c.CustomerID = 5;   | Error Code: 1054. Unknown column 'o.OrderID' in 'on clause' | 0.000 sec             |
| 4 | 15:05:16 | SELECT c.CustomerID, c.FirstName, c.LastName FROM Customers c JOIN Orders o ON c.CustomerID = o.CustomerID WHERE c.CustomerID = 5;   | 0 row(s) returned   | 0.015 sec / 0.000 sec |
| 5 | 15:05:23 | SELECT c.CustomerID, c.FirstName, c.LastName FROM Customers c JOIN OrderDetails od ON o.OrderID = od.OrderID WHERE c.CustomerID = 5;   | 0 row(s) returned   | 0.000 sec / 0.000 sec |
| 6 | 15:05:37 | SELECT c.CustomerID, c.FirstName, c.LastName FROM Customers c JOIN Orders o ON c.CustomerID = o.CustomerID WHERE c.CustomerID = 5;   | 1 row(s) returned   | 0.000 sec / 0.000 sec |
| 7 | 15:07:20 | SELECT c.CustomerID, c.FirstName, c.LastName, SUM(o.TotalAmount * od.Quantity) AS TotalRevenue FROM Customers c JOIN Orders o ON c.CustomerID = o.CustomerID WHERE c.CustomerID = 5; | 1 row(s) returned   | 0.000 sec / 0.000 sec |

**Q6. Write an SQL query to find the customers who have placed the most orders. List their names and the number of orders they've placed.**

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Displays the following SQL code:
 

```

291     JOIN OrderDetails od ON o.OrderID = od.OrderID
292     WHERE c.CustomerID = 5;
293
294 •   SELECT c.FirstName, c.LastName, COUNT(o.OrderID) AS NoOfOrders
295     FROM Customers c
296     JOIN Orders o ON c.CustomerID = o.CustomerID
297     GROUP BY c.CustomerID, c.FirstName, c.LastName
      
```
- Result Grid:** Shows the output of the query:
 

| FirstName | LastName | NoOfOrders |
|-----------|----------|------------|
| John      | Doe      | 1          |
- Output Window:** Shows the execution log with the following entries:
 

| # | Time     | Action   | Message   | Duration / Fetch      |
|---|----------|--|---|-----------------------|
| 1 | 15:22:10 | SELECT c.FirstName, c.LastName, COUNT(o.OrderID) AS NoOfOrders FROM Customers c JOIN Orders o ON c.CustomerID = o.CustomerID WHERE c.CustomerID = 5; | Error Code: 1140. In aggregated query without GROUP BY, expression #1 of SELECT list contains nonaggregated column 'c.FirstName'... | 0.000 sec             |
| 2 | 15:23:00 | SELECT c.FirstName, c.LastName, COUNT(o.OrderID) AS NoOfOrders FROM Customers c JOIN Orders o ON c.CustomerID = o.CustomerID WHERE c.CustomerID = 5; | 1 row(s) returned   | 0.015 sec / 0.000 sec |

**Q7. Write an SQL query to find the most popular product category, which is the one with the highest total quantity ordered across all orders.**

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Contains the following SQL code:
 

```

295 JOIN Orders o ON c.CustomerID = o.CustomerID
296 GROUP BY c.CustomerID, c.FirstName, c.LastName
297 ORDER BY NoOfOrders DESC
298 LIMIT 1;
299
300
301 • SELECT p.ProductID, p.ProductName, SUM(od.Quantity) AS TotalQuantityOrdered
      
```
- Result Grid:** Displays the result of the query:
 

| ProductID | ProductName | TotalQuantityOrdered |
|-----------|-------------|----------------------|
| 2         | Smartphone  | 3                    |
- Output Window:** Shows the execution log:
 

```

1 08:37:30 SELECT p.ProductID, p.ProductName, SUM(od.Quantity) AS TotalQuantityOrdered FROM Products p JOIN OrderDetails od ON p.ProductID = od.ProductID GROUP BY p.ProductID, od.OrderID ORDER BY TotalQuantityOrdered DESC LIMIT 1;
1 row(s) returned
      
```

**Q8. Write an SQL query to find the customer who has spent the most money (highest total revenue) on electronic gadgets. List their name and total spending.**

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Contains the following SQL code:
 

```

305 ORDER BY TotalQuantityOrdered DESC
306 LIMIT 1;
307
308 • SELECT c.CustomerID, c.FirstName, c.LastName, SUM(od.Quantity * p.Price) AS TotalSpending
      
```
- Result Grid:** Displays the result of the query:
 

| CustomerID | FirstName | LastName | TotalSpending |
|------------|-----------|----------|---------------|
| 1          | John      | Doe      | 2602          |
- Output Window:** Shows the execution log for two queries:
 

```

1 08:37:30 SELECT p.ProductID, p.ProductName, SUM(od.Quantity) AS TotalQuantityOrdered FROM Products p JOIN OrderDetails od ON p.ProductID = od.ProductID GROUP BY p.ProductID, od.OrderID ORDER BY TotalQuantityOrdered DESC LIMIT 1;
1 row(s) returned
0.015 sec / 0.000 sec
      
```

```

2 08:40:51 SELECT c.CustomerID, c.FirstName, c.LastName, SUM(od.Quantity * p.Price) AS TotalSpending FROM Customers c JOIN Orders o ON c.CustomerID = o.CustomerID JOIN OrderDetails od ON o.OrderID = od.OrderID ORDER BY TotalSpending DESC LIMIT 1;
1 row(s) returned
0.015 sec / 0.000 sec
      
```

**Q9. Write an SQL query to calculate the average order value (total revenue divided by the number of orders) for all customers.**

The screenshot shows the MySQL Workbench interface with a query editor window titled "Query 1". The query is:264 • ;  
265  
266 • select sum(TotalAmount) from Orders;  
267  
268 • select avg(TotalAmount) from Orders;  
269  
270The result grid shows one row with the value 672.2222. The status bar at the bottom right indicates the duration is 0.000 sec / 0.000 sec.

**Q10. Write an SQL query to find the total number of orders placed by each customer and list their names along with the order count.**

The screenshot shows the MySQL Workbench interface with a query editor window titled "Query 1". The query is:318 • SELECT c.CustomerID, c.FirstName, c.LastName, COUNT(o.CustomerID) AS NoOfOrdersPlaced  
FROM Customers c  
JOIN Orders o ON c.CustomerID = o.CustomerID  
GROUP BY c.CustomerID, c.FirstName, c.LastName  
ORDER BY NoOfOrdersPlaced DESC;  
323  
324The result grid displays 10 rows of data:CustomerID FirstName LastName NoOfOrdersPlaced  
1 John Doe 1  
2 Jane Smith 1  
3 Robert Johnson 1  
4 Sarah Miller 1  
5 Michael Davis 1  
6 Emily Brown 1  
7 Olivia Lee 1  
8 James Taylor 1  
9 Emma Wilson 1  
10The status bar at the bottom right indicates the duration is 0.000 sec / 0.000 sec.