SQL PROJECT

E-Commerce Website Database

Abstract:

The E-commerce Website Database Project represents a critical initiative in establishing a robust SQL database system to support our online retail platform. With a core structure comprising tables for categories, customers, products, orders, and order items, this project aims to optimize key facets of our e-commerce operations. It focuses on efficient product categorization, personalized customer management, accurate product data maintenance, streamlined order processing, and meticulous inventory control. By addressing these fundamental elements, the project seeks to not only enhance the user experience but also provide the organization with valuable data-driven insights, enabling informed decisions and sustained growth in the competitive e-commerce landscape.

Aim of Project:

The E-commerce Website Database Project aims to build a comprehensive SQL database that underpins our e-commerce operations, improving product management, customer engagement, order processing, inventory control, and data-driven decision-making. This project plays a crucial role in the success and growth of our online store.

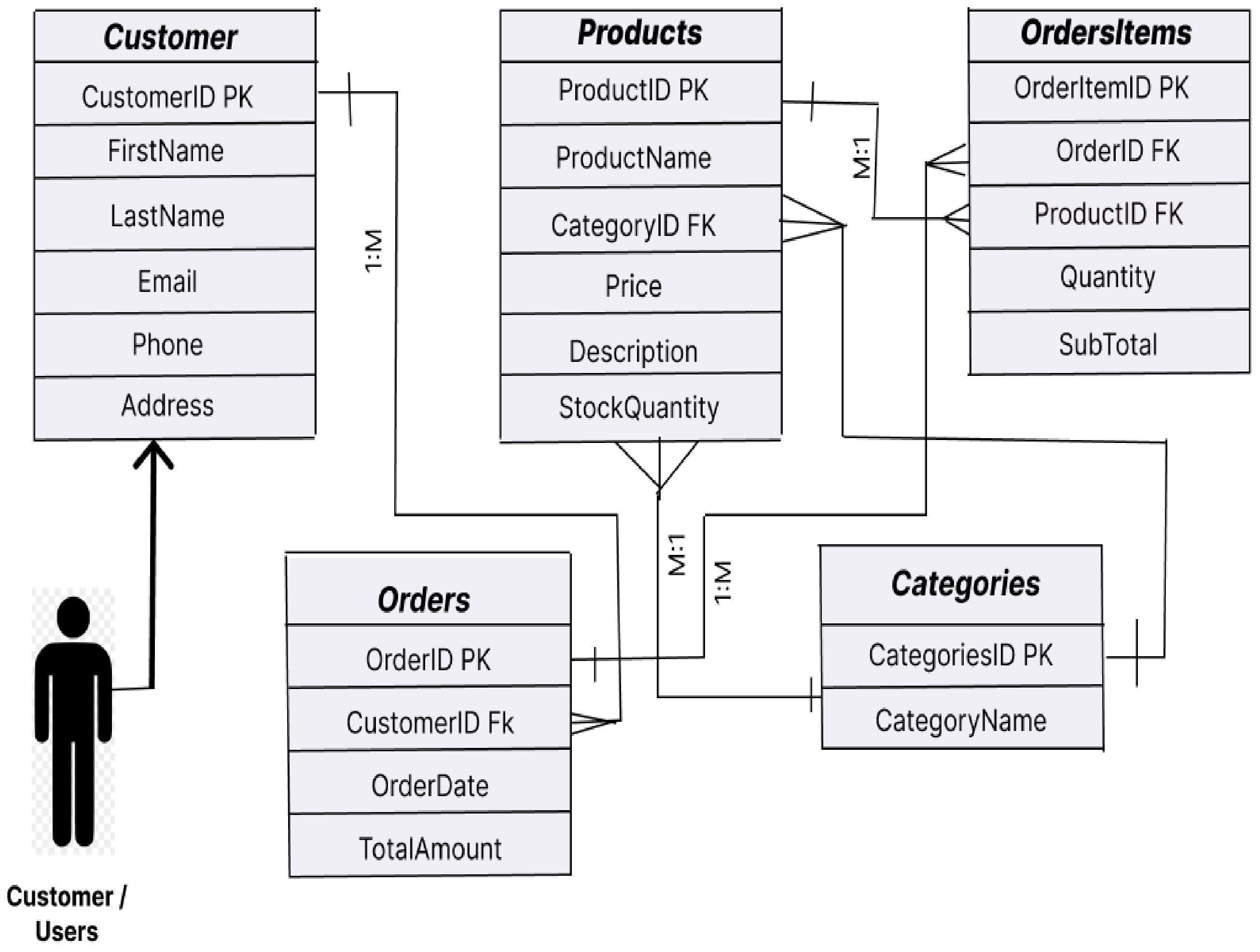
Objective of Project:

The objective of the E-commerce Website Database Project is to establish a well-structured SQL database that efficiently manages categories, customers, products, orders, and order items. The key goals include creating a seamless product categorization system, enhancing customer management for personalized experiences, optimizing product data management, streamlining order processing, ensuring accurate inventory control, enabling data analytics and reporting, facilitating scalability, prioritizing data security and integrity, and ultimately, enhancing the overall customer experience on our e-commerce platform. This project aims to provide a solid foundation for growth, efficiency, and data-driven decision-making within our online store.

Introduction:

The E-commerce website database project aims to build a strong SQL database system to support our online retail platform. The five key tables that make up the system are the categories, customers, products, orders, and order items. Our e-commerce ecosystem is supported by these tables, which accelerate order processing, accurate product data handling, smooth customer administration, and thorough inventory control. By concentrating on these elements, we hope to improve our customers' entire purchasing experience while providing our company with useful information for data-driven decision-making and future expansion.

ER Diagram:



To create a database for an E-commerce website, we need to define the tables and their relationships. Here's a simplified structure of tables

1. **Products Table:**
   - ProductID (Primary Key)
   - ProductName
   - CategoryID (Foreign Key)
   - Price
   - Description
   - StockQuantity

2. **Categories Table:**
   - CategoryID (Primary Key)
   - CategoryName

3. **Customers Table:**
   - CustomerID (Primary Key)
   - FirstName
   - LastName
   - Email
   - Phone
   - Address

4. Orders Table:

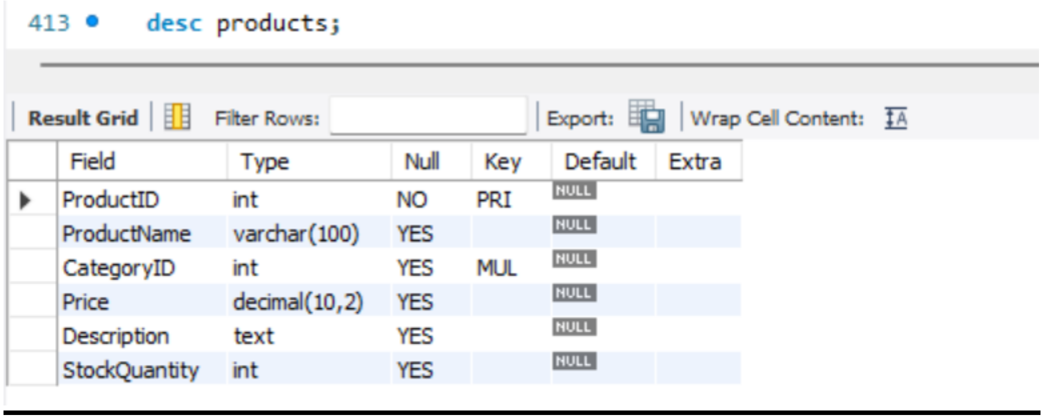
- OrderID (Primary Key)
- CustomerID (Foreign Key)
- OrderDate
- TotalAmount

5. OrderItems Table:

- OrderItemID (Primary Key)
- OrderID (Foreign Key)
- ProductID (Foreign Key)
- Quantity
- Subtotal

STRUCTURE OF TABLES

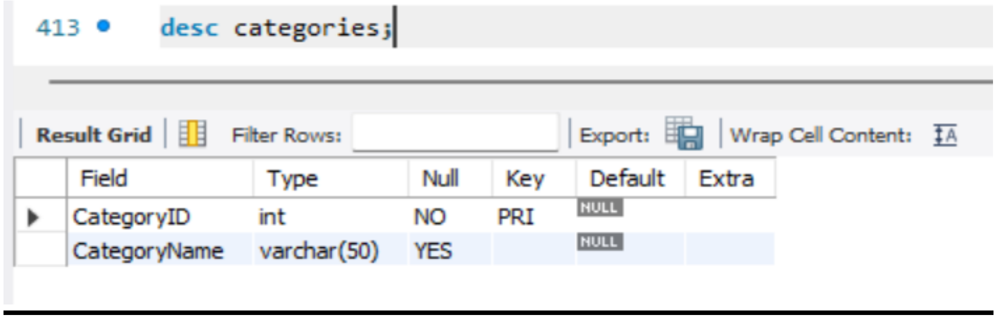
1. Products:



```
desc products;
```

Field	Type	Null	Key	Default	Extra
ProductID	int	NO	PRI	NULL	
ProductName	varchar(100)	YES		NULL	
CategoryID	int	YES	MUL	NULL	
Price	decimal(10,2)	YES		NULL	
Description	text	YES		NULL	
StockQuantity	int	YES		NULL	

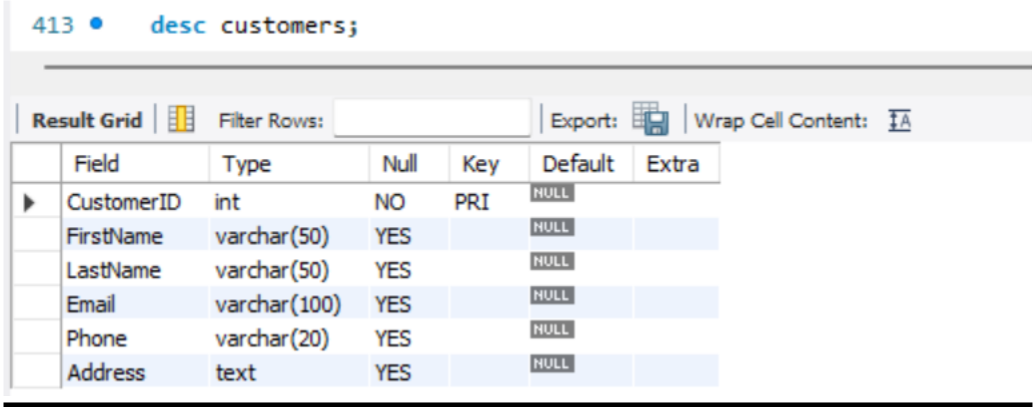
2. Categories:



```
desc categories;
```

Field	Type	Null	Key	Default	Extra
CategoryID	int	NO	PRI	NULL	
CategoryName	varchar(50)	YES		NULL	

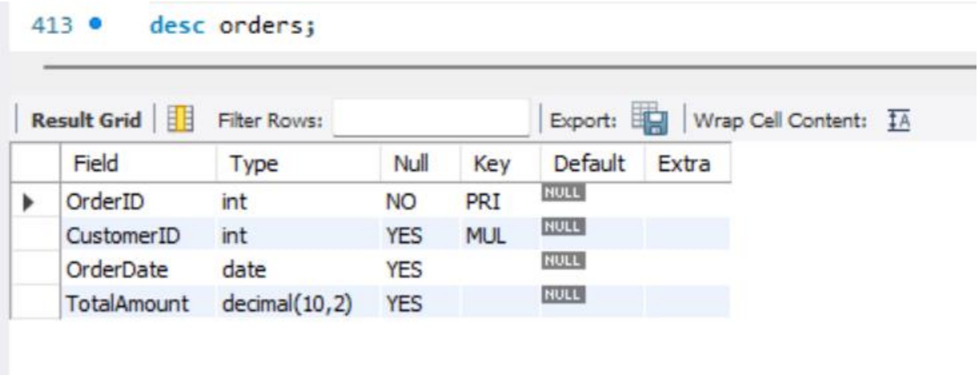
3. Customers:



```
desc customers;
```

Field	Type	Null	Key	Default	Extra
CustomerID	int	NO	PRI	NULL	
FirstName	varchar(50)	YES		NULL	
LastName	varchar(50)	YES		NULL	
Email	varchar(100)	YES		NULL	
Phone	varchar(20)	YES		NULL	
Address	text	YES		NULL	

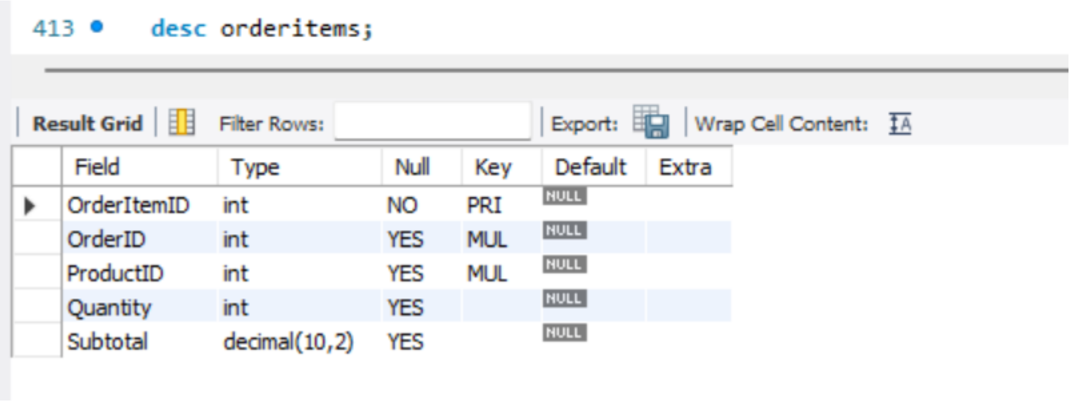
4. Orders:



```
desc orders;
```

Field	Type	Null	Key	Default	Extra
OrderID	int	NO	PRI	NULL	
CustomerID	int	YES	MUL	NULL	
OrderDate	date	YES		NULL	
TotalAmount	decimal(10,2)	YES		NULL	

5. OrderItems:

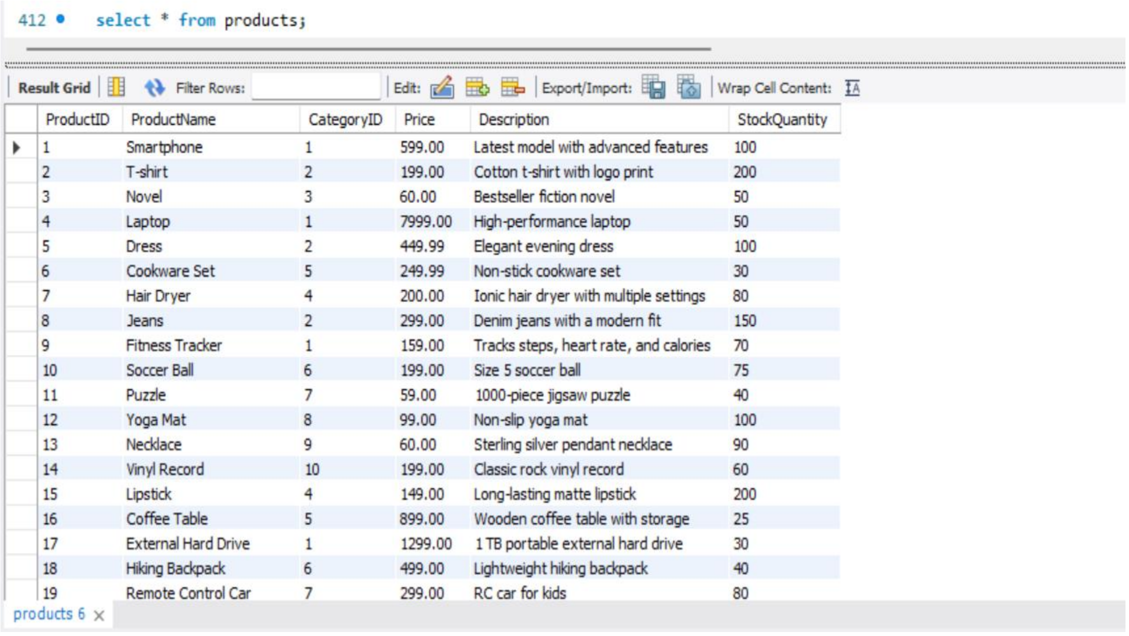


```
desc orderitems;
```

Field	Type	Null	Key	Default	Extra
OrderItemID	int	NO	PRI	NULL	
OrderID	int	YES	MUL	NULL	
ProductID	int	YES	MUL	NULL	
Quantity	int	YES		NULL	
Subtotal	decimal(10,2)	YES		NULL	

CONTENS OF TABLES:

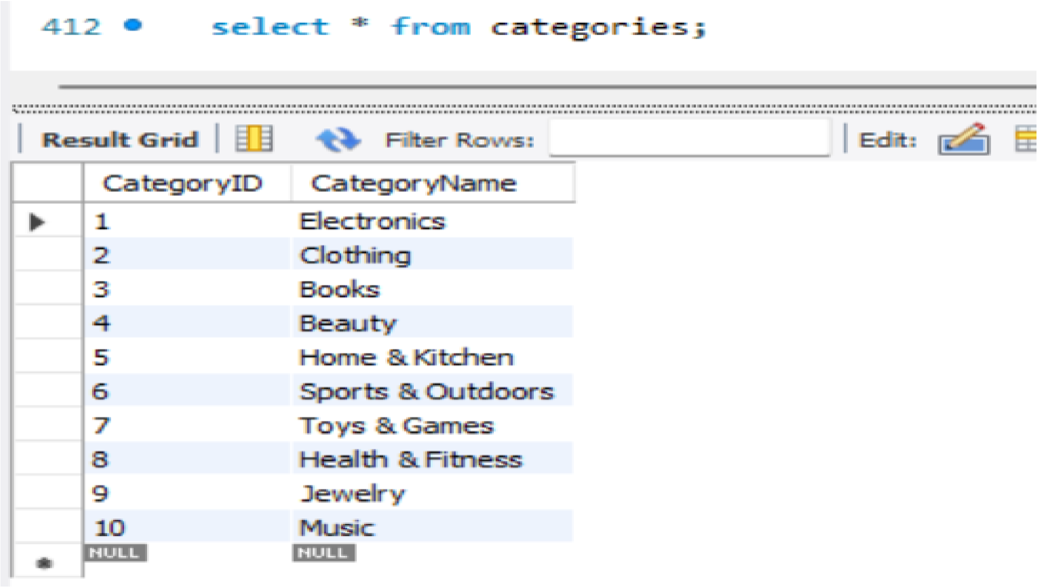
1. Products:



```
412 ●   select * from products;
```

ProductID	ProductName	CategoryID	Price	Description	StockQuantity
1	Smartphone	1	599.00	Latest model with advanced features	100
2	T-shirt	2	199.00	Cotton t-shirt with logo print	200
3	Novel	3	60.00	Bestseller fiction novel	50
4	Laptop	1	7999.00	High-performance laptop	50
5	Dress	2	449.99	Elegant evening dress	100
6	Cookware Set	5	249.99	Non-stick cookware set	30
7	Hair Dryer	4	200.00	Ionic hair dryer with multiple settings	80
8	Jeans	2	299.00	Denim jeans with a modern fit	150
9	Fitness Tracker	1	159.00	Tracks steps, heart rate, and calories	70
10	Soccer Ball	6	199.00	Size 5 soccer ball	75
11	Puzzle	7	59.00	1000-piece jigsaw puzzle	40
12	Yoga Mat	8	99.00	Non-slip yoga mat	100
13	Necklace	9	60.00	Sterling silver pendant necklace	90
14	Vinyl Record	10	199.00	Classic rock vinyl record	60
15	Lipstick	4	149.00	Long-lasting matte lipstick	200
16	Coffee Table	5	899.00	Wooden coffee table with storage	25
17	External Hard Drive	1	1299.00	1 TB portable external hard drive	30
18	Hiking Backpack	6	499.00	Lightweight hiking backpack	40
19	Remote Control Car	7	299.00	RC car for kids	80

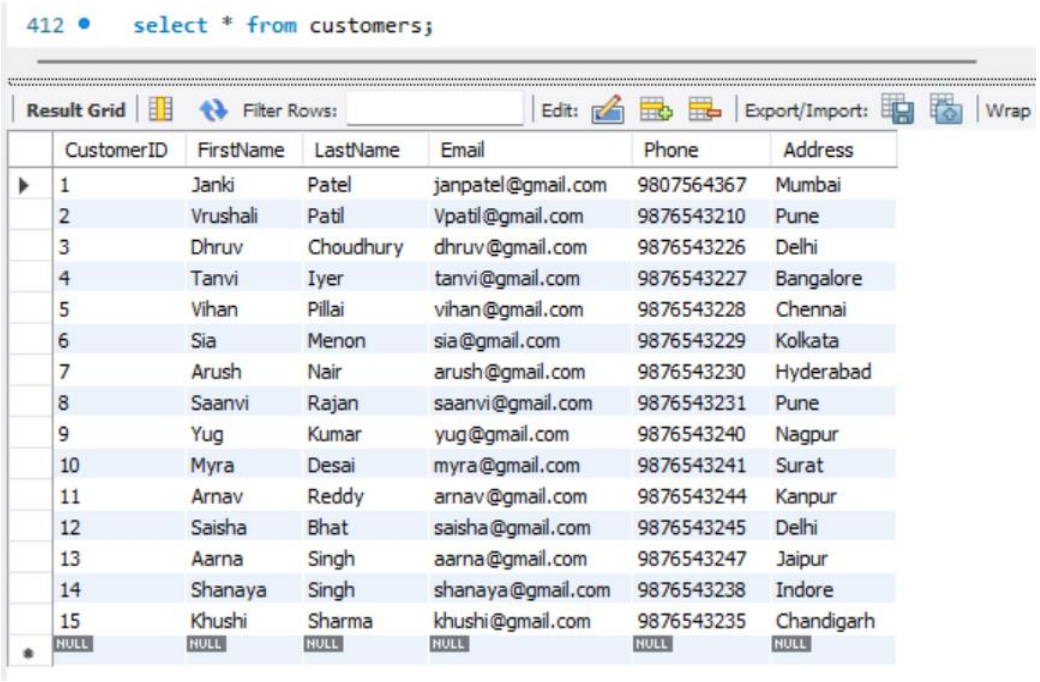
2. Categories:



```
412 ●   select * from categories;
```

CategoryID	CategoryName
1	Electronics
2	Clothing
3	Books
4	Beauty
5	Home & Kitchen
6	Sports & Outdoors
7	Toys & Games
8	Health & Fitness
9	Jewelry
10	Music
NULL	NULL

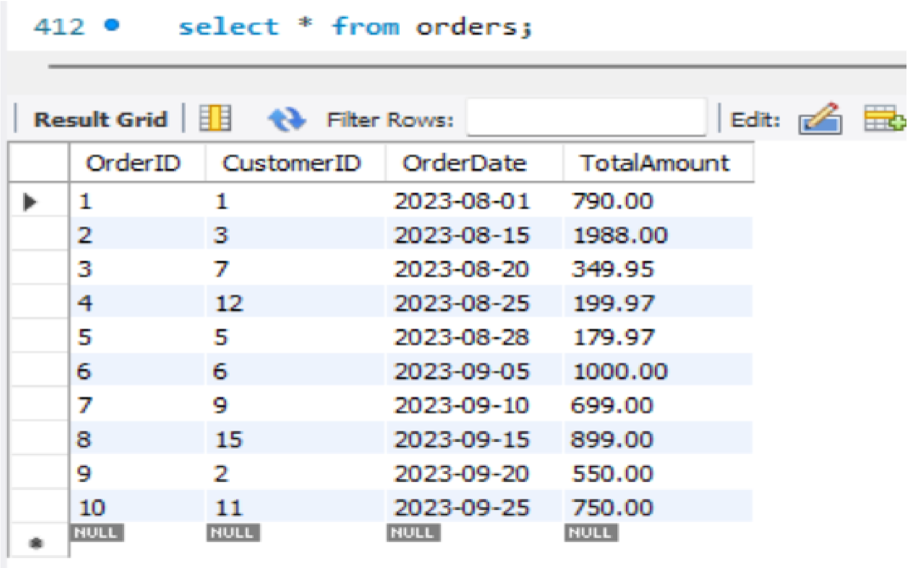
3. Customers:



```
select * from customers;
```

CustomerID	FirstName	LastName	Email	Phone	Address
1	Janki	Patel	janpatel@gmail.com	9807564367	Mumbai
2	Vrushali	Patil	Vpatil@gmail.com	9876543210	Pune
3	Dhruv	Choudhury	dhruv@gmail.com	9876543226	Delhi
4	Tanvi	Iyer	tanvi@gmail.com	9876543227	Bangalore
5	Vihan	Pillai	vihan@gmail.com	9876543228	Chennai
6	Sia	Menon	sia@gmail.com	9876543229	Kolkata
7	Arush	Nair	arush@gmail.com	9876543230	Hyderabad
8	Saanvi	Rajan	saanvi@gmail.com	9876543231	Pune
9	Yug	Kumar	yug@gmail.com	9876543240	Nagpur
10	Myra	Desai	myra@gmail.com	9876543241	Surat
11	Arnav	Reddy	arnav@gmail.com	9876543244	Kanpur
12	Saisha	Bhat	saisha@gmail.com	9876543245	Delhi
13	Aarna	Singh	aarna@gmail.com	9876543247	Jaipur
14	Shanaya	Singh	shanaya@gmail.com	9876543238	Indore
15	Khushi	Sharma	khushi@gmail.com	9876543235	Chandigarh
NULL	NULL	NULL	NULL	NULL	NULL

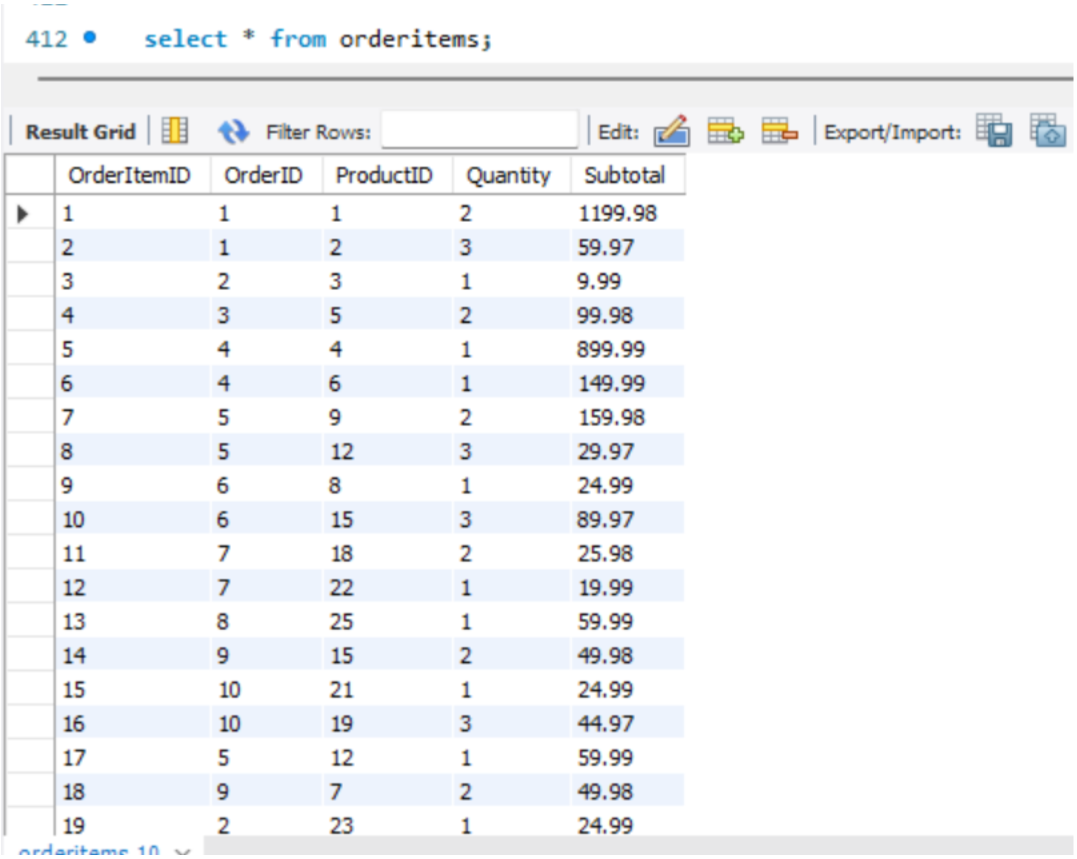
4. Orders:



```
select * from orders;
```

OrderID	CustomerID	OrderDate	TotalAmount
1	1	2023-08-01	790.00
2	3	2023-08-15	1988.00
3	7	2023-08-20	349.95
4	12	2023-08-25	199.97
5	5	2023-08-28	179.97
6	6	2023-09-05	1000.00
7	9	2023-09-10	699.00
8	15	2023-09-15	899.00
9	2	2023-09-20	550.00
10	11	2023-09-25	750.00
NULL	NULL	NULL	NULL

5. OrderItems:



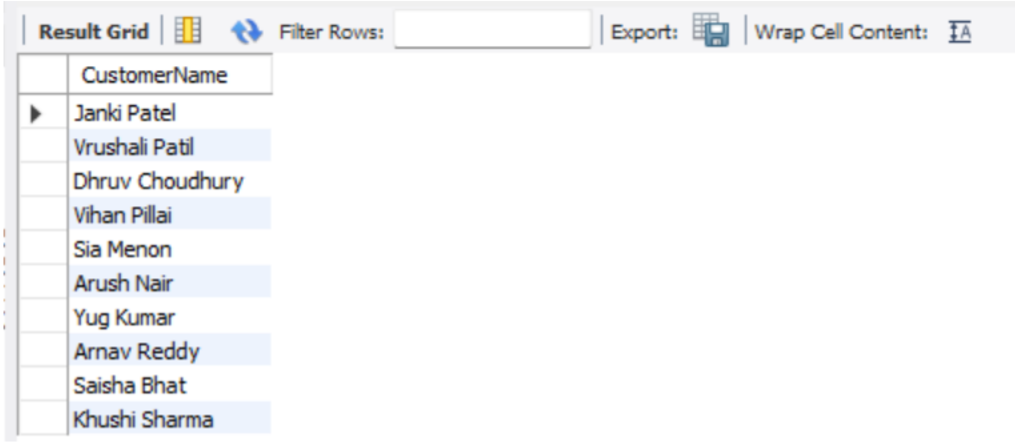
```
select * from orderitems;
```

OrderItemID	OrderID	ProductID	Quantity	Subtotal
1	1	1	2	1199.98
2	1	2	3	59.97
3	2	3	1	9.99
4	3	5	2	99.98
5	4	4	1	899.99
6	4	6	1	149.99
7	5	9	2	159.98
8	5	12	3	29.97
9	6	8	1	24.99
10	6	15	3	89.97
11	7	18	2	25.98
12	7	22	1	19.99
13	8	25	1	59.99
14	9	15	2	49.98
15	10	21	1	24.99
16	10	19	3	44.97
17	5	12	1	59.99
18	9	7	2	49.98
19	2	23	1	24.99

QURIES

1. Fetch the the names of customers who placed orders:

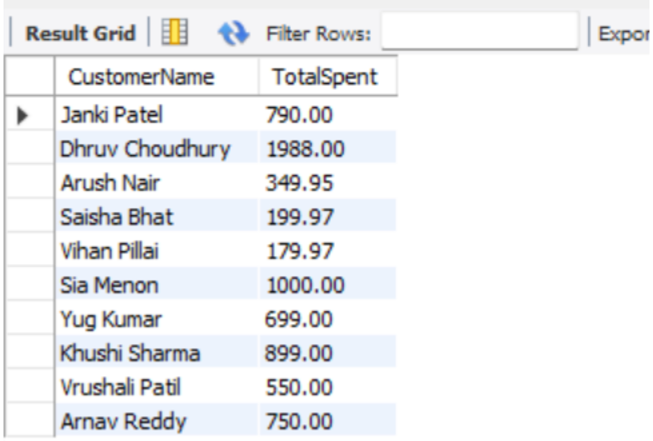
```
Select concat(firstname, ' ', lastname) as customername
From customers
Where customerid in (select distinct customerid from orders);
```



CustomerName
Janki Patel
Vrushali Patil
Dhruv Choudhury
Vihan Pillai
Sia Menon
Arush Nair
Yug Kumar
Arnav Reddy
Saisha Bhat
Khushi Sharma

2. Find the total amount spent by each customer:

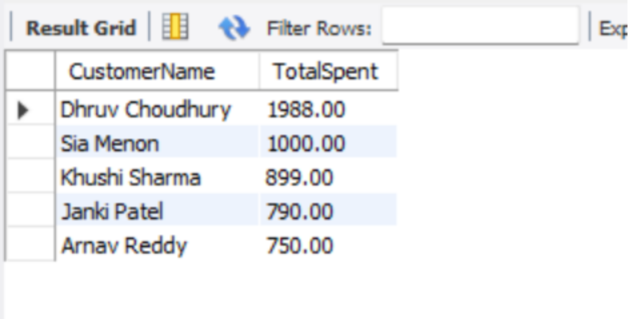
```
Select concat(firstname, ' ', lastname) as customername,
sum(totalamount) as totalspent
From customers
Join orders on customers.customerid = orders.customerid
Group by customername;
```



CustomerName	TotalSpent
Janki Patel	790.00
Dhruv Choudhury	1988.00
Arush Nair	349.95
Saisha Bhat	199.97
Vihan Pillai	179.97
Sia Menon	1000.00
Yug Kumar	699.00
Khushi Sharma	899.00
Vrushali Patil	550.00
Arnav Reddy	750.00

3.Fetch the the top 5 customers who spent the most:

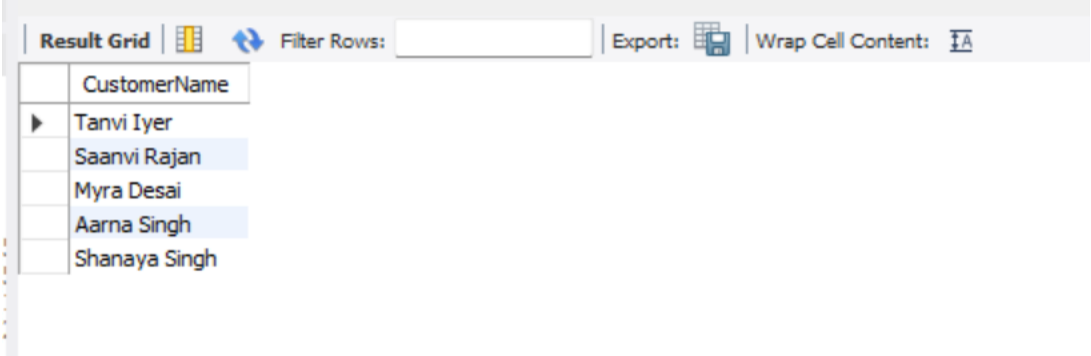
```
Select concat(firstname, ' ', lastname) as customername,
sum(totalamount) as totalspent
From customers
Join orders on customers.customerid = orders.customerid
Group by customername
Order by totalspent desc
Limit 5;
```



CustomerName	TotalSpent
Dhruv Choudhury	1988.00
Sia Menon	1000.00
Khushi Sharma	899.00
Janki Patel	790.00
Arnav Reddy	750.00

4.Fetch the customers who haven't placed any orders:

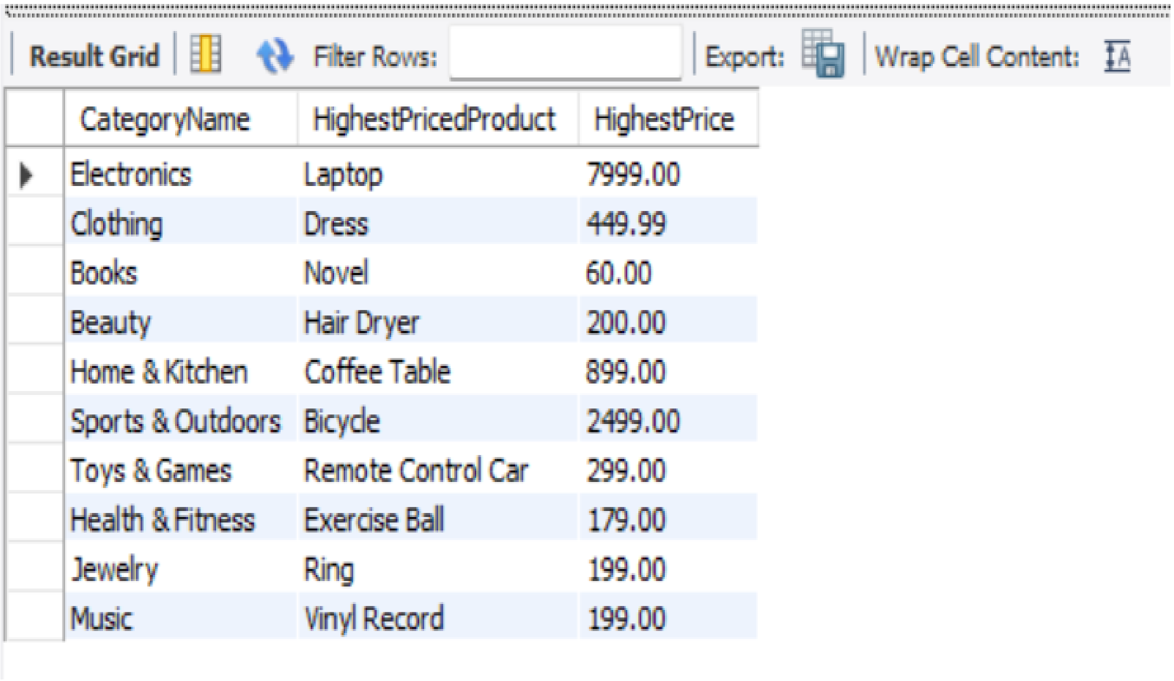
```
Select concat(firstname, ' ', lastname) as customername
From customers
Where customerid not in (select distinct customerid from orders);
```



CustomerName
Tanvi Iyer
Saanvi Rajan
Myra Desai
Aarna Singh
Shanaya Singh

5. Find the highest priced products in each category:

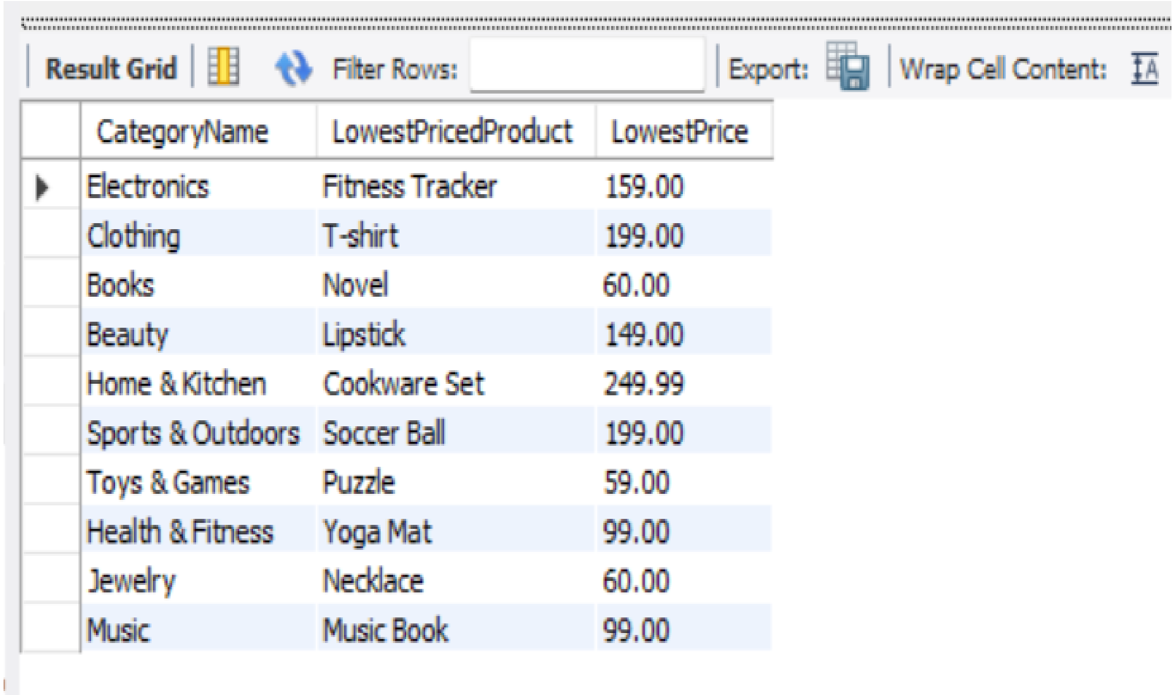
```
Select c.categoryname, p1.productname as highestpricedproduct,
p1.price as highestprice
From categories c
Left join products p1
On c.categoryid = p1.categoryid
Where p1.price = (select max(price) from products where
categoryid = c.categoryid);
```



CategoryName	HighestPricedProduct	HighestPrice
Electronics	Laptop	7999.00
Clothing	Dress	449.99
Books	Novel	60.00
Beauty	Hair Dryer	200.00
Home & Kitchen	Coffee Table	899.00
Sports & Outdoors	Bicycle	2499.00
Toys & Games	Remote Control Car	299.00
Health & Fitness	Exercise Ball	179.00
Jewelry	Ring	199.00
Music	Vinyl Record	199.00

6. Find the lowest priced products in each category:

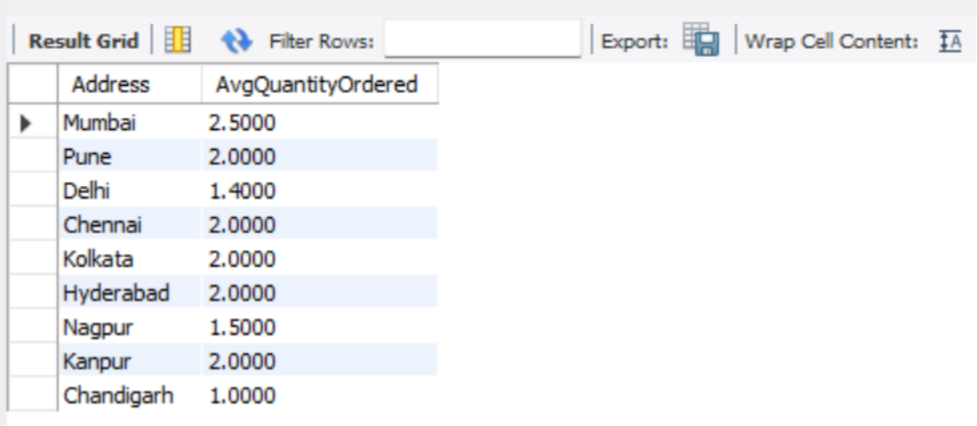
```
Select c.categoryname, p.productname as lowestpricedproduct, p.price as lowestprice
From categories c
Left join products p
On c.categoryid = p.categoryid
Where p.price = (select min(price) from products where categoryid = c.categoryid);
```



	CategoryName	LowestPricedProduct	LowestPrice
▶	Electronics	Fitness Tracker	159.00
	Clothing	T-shirt	199.00
	Books	Novel	60.00
	Beauty	Lipstick	149.00
	Home & Kitchen	Cookware Set	249.99
	Sports & Outdoors	Soccer Ball	199.00
	Toys & Games	Puzzle	59.00
	Health & Fitness	Yoga Mat	99.00
	Jewelry	Necklace	60.00
	Music	Music Book	99.00

7. Find the average quantity of products ordered by customers in each city:

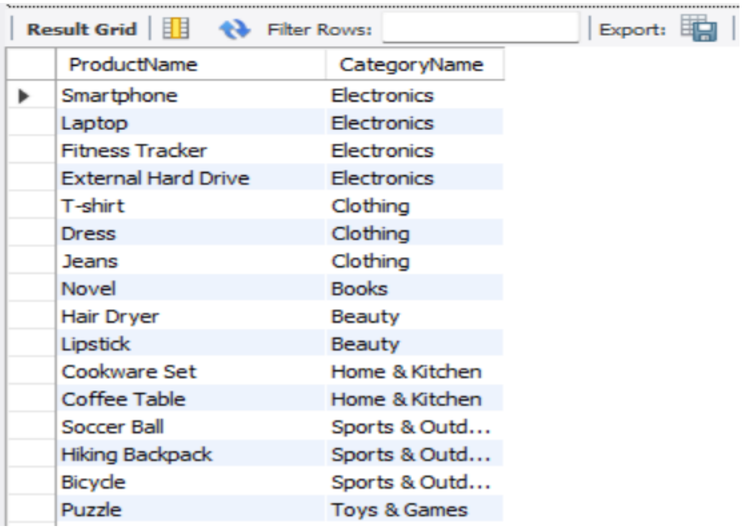
```
Select c.address, avg(oi.quantity) as avgquantityordered
From customers c
Join orders o on c.customerid = o.customerid
Join orderitems oi on o.orderid = oi.orderid
Group by c.address;
```



Address	AvgQuantityOrdered
Mumbai	2.5000
Pune	2.0000
Delhi	1.4000
Chennai	2.0000
Kolkata	2.0000
Hyderabad	2.0000
Nagpur	1.5000
Kanpur	2.0000
Chandigarh	1.0000

8. Fetch the products along with their category names:

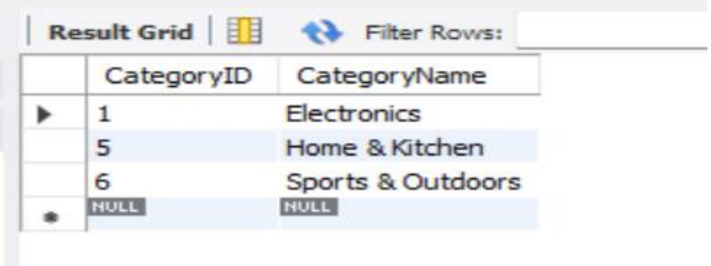
```
Select p.productname, c.categoryname
From products p
Inner join
Categories c
On p.categoryid = c.categoryid;
```



ProductName	CategoryName
Smartphone	Electronics
Laptop	Electronics
Fitness Tracker	Electronics
External Hard Drive	Electronics
T-shirt	Clothing
Dress	Clothing
Jeans	Clothing
Novel	Books
Hair Dryer	Beauty
Lipstick	Beauty
Cookware Set	Home & Kitchen
Coffee Table	Home & Kitchen
Soccer Ball	Sports & Outd...
Hiking Backpack	Sports & Outd...
Bicycle	Sports & Outd...
Puzzle	Toys & Games

9.List the categories that have products with prices higher than the average price of all products:

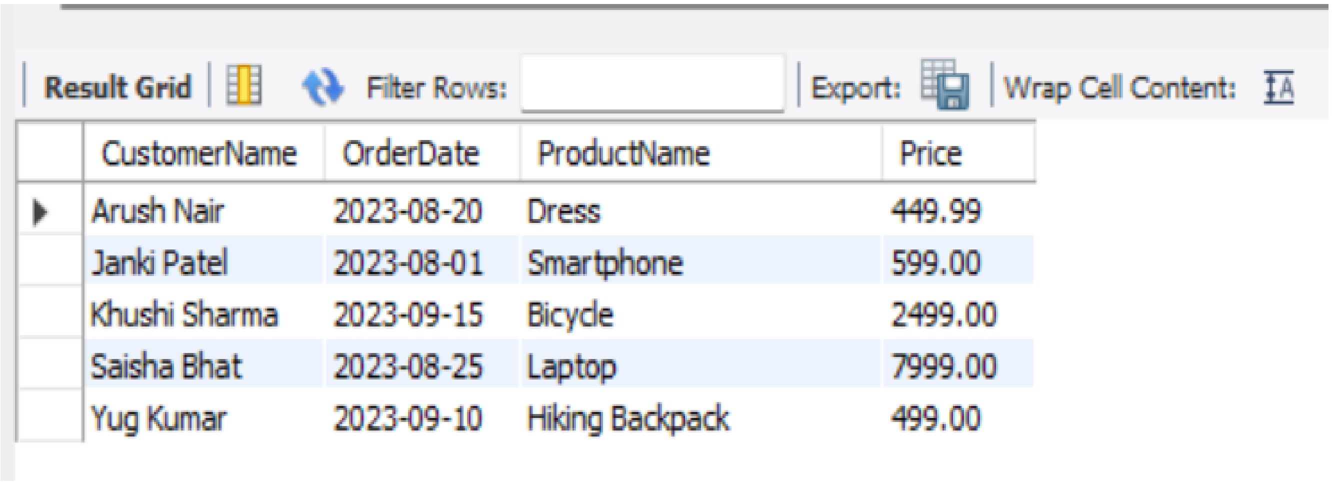
```
Select * From categories
Where categoryid in (select distinct p.categoryid
   from products p
   where p.price > (select avg(price)from products));
```



CategoryID	CategoryName
1	Electronics
5	Home & Kitchen
6	Sports & Outdoors
NULL	NULL

10. Fetch the customers who have ordered products with a price higher than a certain threshold along with product details

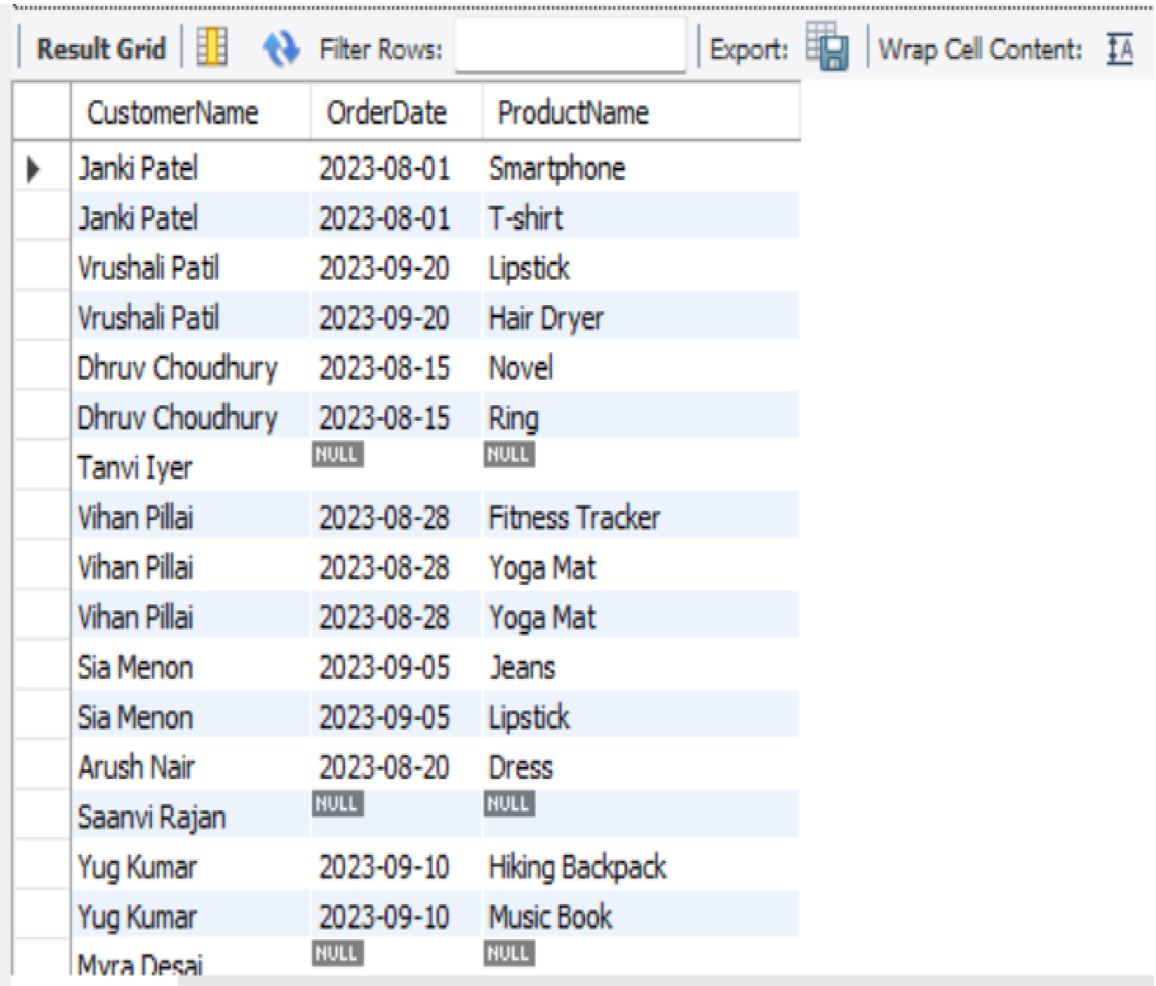
```
Select concat(c.firstname, ' ', c.lastname) as customername,
o.orderdate, p.productname, p.price

From customers c

Inner join orders o

On c.customerid = o.customerid

Join orderitems oi on o.orderid = oi.orderid

Join products p on oi.productid = p.productid

Where p.price > 400

Order by customername, o.orderdate;
```



CustomerName	OrderDate	ProductName	Price
Arush Nair	2023-08-20	Dress	449.99
Janki Patel	2023-08-01	Smartphone	599.00
Khushi Sharma	2023-09-15	Bicycle	2499.00
Saisha Bhat	2023-08-25	Laptop	7999.00
Yug Kumar	2023-09-10	Hiking Backpack	499.00

11. perform a LEFT JOIN to see which customers have ordered which products.

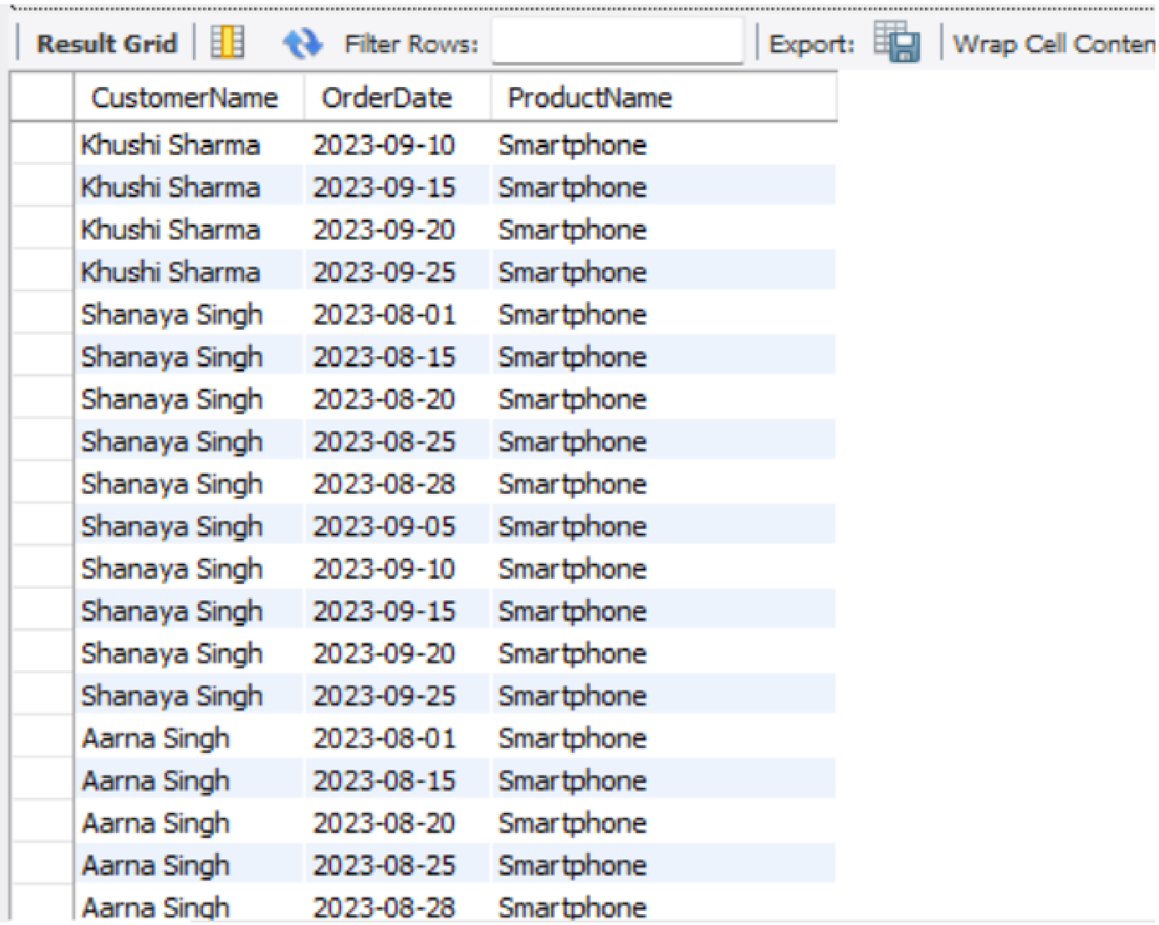
```
Select concat(c.firstname, ' ', c.lastname) as customername,
orders.orderdate, products.productname
From customers c
Left join orders
on c.customerid = orders.customerid
Left join orderitems
on orders.orderid = orderitems.orderid
Left join products
on orderitems.productid = products.productid;
```



CustomerName	OrderDate	ProductName
Janki Patel	2023-08-01	Smartphone
Janki Patel	2023-08-01	T-shirt
Vrushali Patil	2023-09-20	Lipstick
Vrushali Patil	2023-09-20	Hair Dryer
Dhruv Choudhury	2023-08-15	Novel
Dhruv Choudhury	2023-08-15	Ring
Tanvi Iyer	NULL	NULL
Vihan Pillai	2023-08-28	Fitness Tracker
Vihan Pillai	2023-08-28	Yoga Mat
Vihan Pillai	2023-08-28	Yoga Mat
Sia Menon	2023-09-05	Jeans
Sia Menon	2023-09-05	Lipstick
Arush Nair	2023-08-20	Dress
Saanvi Rajan	NULL	NULL
Yug Kumar	2023-09-10	Hiking Backpack
Yug Kumar	2023-09-10	Music Book
Myra Desai	NULL	NULL

12. perform a CROSS JOIN to see all possible combinations of customers, orders, and products.

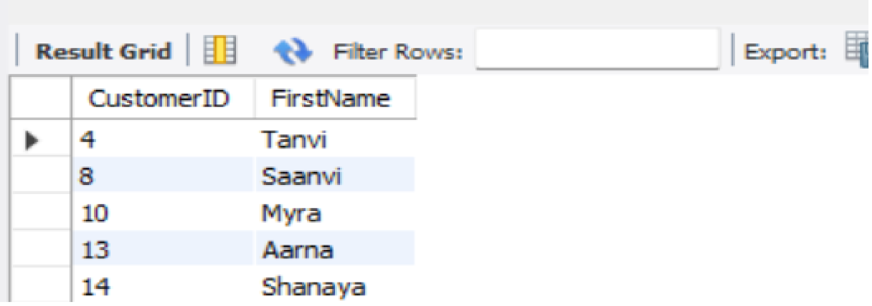
```
Select concat(c.firstname, ' ', c.lastname) as customername,
o.orderdate, p.productname
From customers c
Cross join orders o
Cross join products p;
```



CustomerName	OrderDate	ProductName
Khushi Sharma	2023-09-10	Smartphone
Khushi Sharma	2023-09-15	Smartphone
Khushi Sharma	2023-09-20	Smartphone
Khushi Sharma	2023-09-25	Smartphone
Shanaya Singh	2023-08-01	Smartphone
Shanaya Singh	2023-08-15	Smartphone
Shanaya Singh	2023-08-20	Smartphone
Shanaya Singh	2023-08-25	Smartphone
Shanaya Singh	2023-08-28	Smartphone
Shanaya Singh	2023-09-05	Smartphone
Shanaya Singh	2023-09-10	Smartphone
Shanaya Singh	2023-09-15	Smartphone
Shanaya Singh	2023-09-20	Smartphone
Shanaya Singh	2023-09-25	Smartphone
Aarna Singh	2023-08-01	Smartphone
Aarna Singh	2023-08-15	Smartphone
Aarna Singh	2023-08-20	Smartphone
Aarna Singh	2023-08-25	Smartphone
Aarna Singh	2023-08-28	Smartphone

13. To find customers (left table) who have not placed any orders (right table).

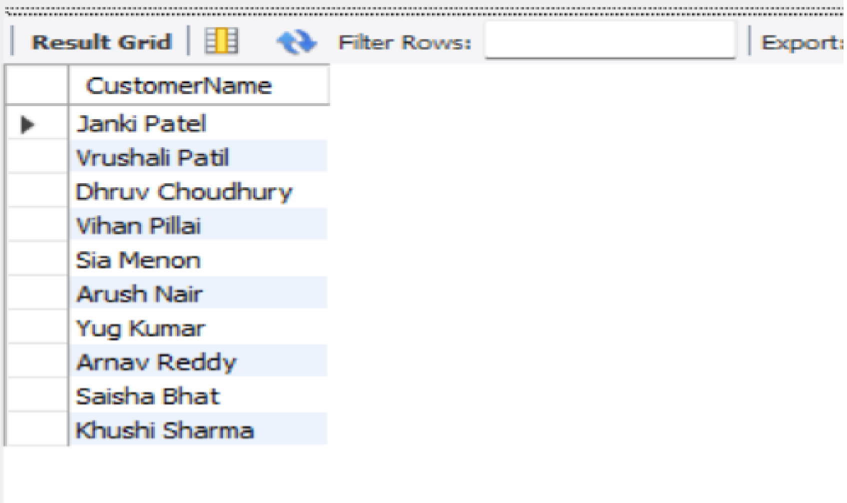
```
Select c.customerid, c.firstname
From customers c
Left join orders o
On c.customerid = o.customerid
Where o.customerid is null;
```



CustomerID	FirstName
4	Tanvi
8	Saanvi
10	Myra
13	Aarna
14	Shanaya

14. Fetch the customers who have placed at least one order:

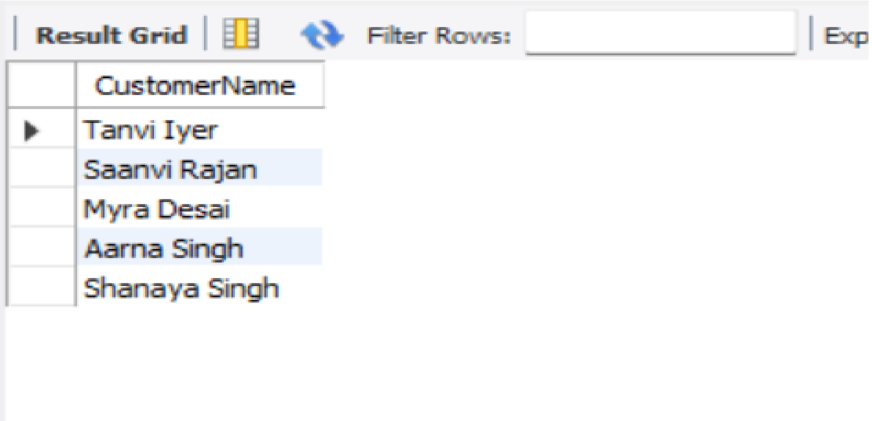
```
Select concat(firstname, ' ', lastname) as customername
From customers c
Where exists (select 1 from orders o
 where o.customerid = c.customerid);
```



CustomerName
Janki Patel
Vrushali Patil
Dhruv Choudhury
Vihan Pillai
Sia Menon
Arush Nair
Yug Kumar
Arnav Reddy
Saisha Bhat
Khushi Sharma

15. Find customers who haven't placed any orders

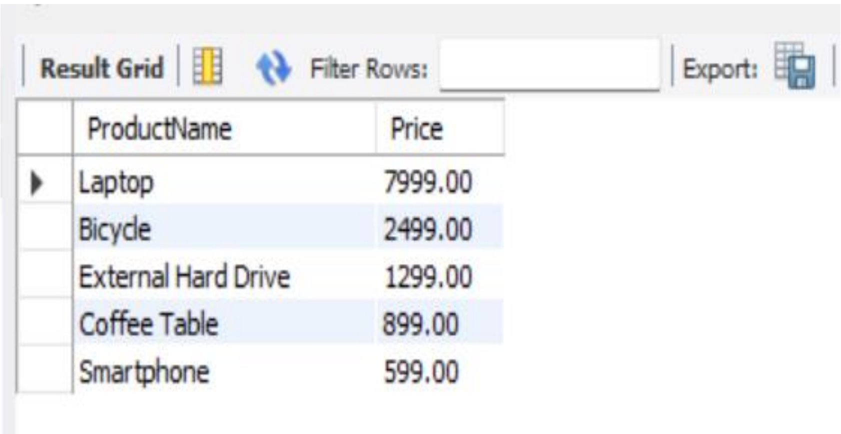
```
Select concat(firstname,' ', lastname) as customername
From customers c
Where not exists (select 1 from orders o
  where o.customerid = c.customerid);
```



	CustomerName
▶	Tanvi Iyer
	Saanvi Rajan
	Myra Desai
	Aarna Singh
	Shanaya Singh

16. Fetch the the top 5 most expensive products:

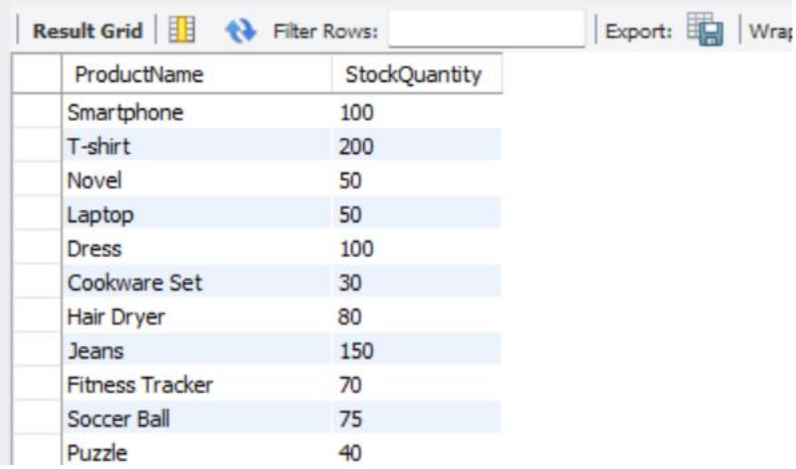
```
Select productname, price
from products
order by price desc
limit 5;
```



	ProductName	Price
▶	Laptop	7999.00
	Bicycle	2499.00
	External Hard Drive	1299.00
	Coffee Table	899.00
	Smartphone	599.00

17. List products with a stock quantity more than 10:

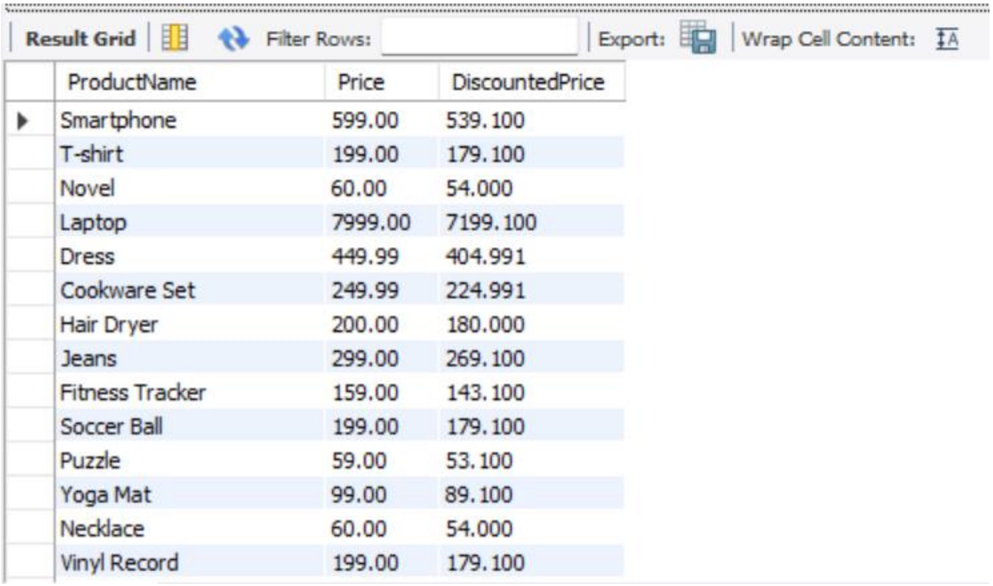
```
Select productname, stockquantity
From products
Where stockquantity > 10 ;
```



ProductName	StockQuantity
Smartphone	100
T-shirt	200
Novel	50
Laptop	50
Dress	100
Cookware Set	30
Hair Dryer	80
Jeans	150
Fitness Tracker	70
Soccer Ball	75
Puzzle	40

18. Calculate the discounted price for products with a 10% discount.

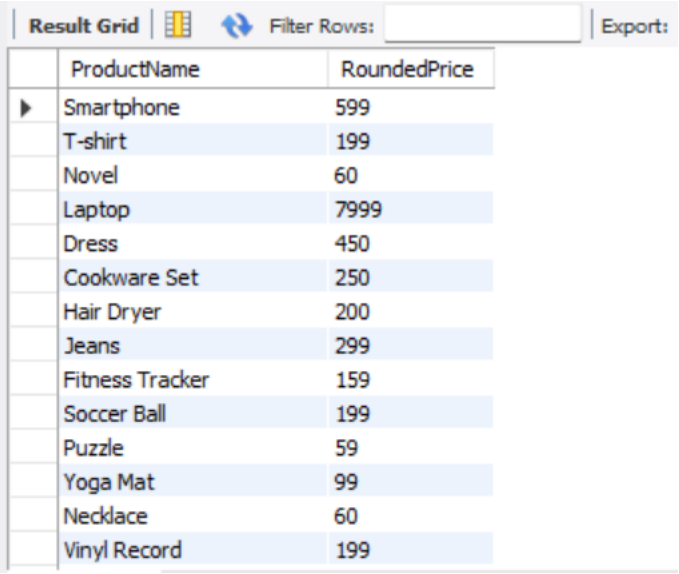
```
Select productname, price, price * 0.9 as DiscountedPrice
From products;
```



ProductName	Price	DiscountedPrice
Smartphone	599.00	539.100
T-shirt	199.00	179.100
Novel	60.00	54.000
Laptop	7999.00	7199.100
Dress	449.99	404.991
Cookware Set	249.99	224.991
Hair Dryer	200.00	180.000
Jeans	299.00	269.100
Fitness Tracker	159.00	143.100
Soccer Ball	199.00	179.100
Puzzle	59.00	53.100
Yoga Mat	99.00	89.100
Necklace	60.00	54.000
Vinyl Record	199.00	179.100

19. Round product prices to the nearest integer.

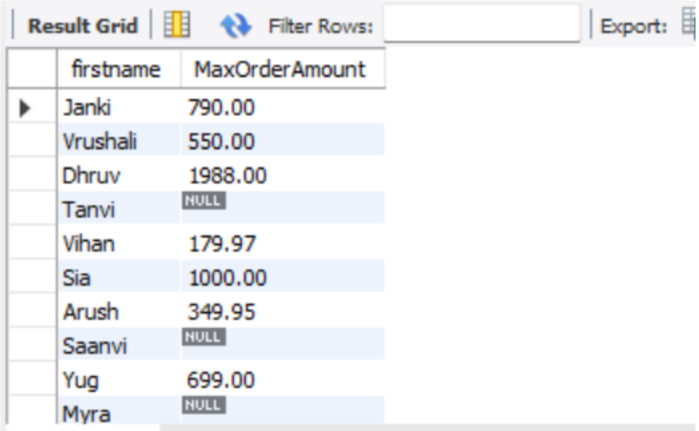
```
Select ProductName, round(Price) AS RoundedPrice
from products;
```



ProductName	RoundedPrice
Smartphone	599
T-shirt	199
Novel	60
Laptop	7999
Dress	450
Cookware Set	250
Hair Dryer	200
Jeans	299
Fitness Tracker	159
Soccer Ball	199
Puzzle	59
Yoga Mat	99
Necklace	60
Vinyl Record	199

20. Find the maximum order amount for each customer using a subquery.

```
select firstname, (
   select max(TotalAmount)
   from orders
   where orders.customerid = customers.customerid
) as MaxOrderAmount
from customers;
```



firstname	MaxOrderAmount
Janki	790.00
Vrushali	550.00
Dhruv	1988.00
Tanvi	NULL
Vihan	179.97
Sia	1000.00
Arush	349.95
Saanvi	NULL
Yug	699.00
Myra	NULL