



INNOVATION. AUTOMATION. ANALYTICS

Grocery Store Management

GROCERY STORE MANAGEMENT



A photograph of a grocery store aisle with blue metal shelving units filled with various products like cereal, snacks, and canned goods. The floor is light-colored tile, and the ceiling has recessed lighting.

Introduction

- A grocery store generates large amounts of data daily from its sales transactions, customer interactions, inventory updates, and supplier activities. From a data analysis perspective, a grocery store provides a wealth of information that can help understand customer behavior, improve inventory management, refine marketing strategies, and boost operational efficiency.
- Data analysts can gather and examine data such as product sales, customer demographics, purchase frequency, seasonal trends, and pricing patterns. By using data analysis techniques, including descriptive, diagnostic, predictive, and prescriptive analytics, they can uncover valuable insights. For instance, sales data reveals best-selling products, inventory data forecasts demand, and customer data informs the design of loyalty programs.
- In the end, data analysis in a grocery store supports making informed decisions, cutting waste, increasing profit margins, and improving customer satisfaction through smarter business strategies.

Supplier Table

	Field	Type	Null	Key	Default	Extra
►	SupplierID	int	YES		NULL	
	SupplierName	text	YES		NULL	
	Address	text	YES		NULL	

Product Table

	Field	Type	Null	Key	Default	Extra
►	ProductID	int	YES		NULL	
	Name	text	YES		NULL	
	SupplierID	int	YES		NULL	
	CategoryID	int	YES		NULL	
	Price	double	YES		NULL	

Category Table

	Field	Type	Null	Key	Default	Extra
►	CategoryID	int	YES		NULL	
	CategoryName	text	YES		NULL	

Customers Table

	Field	Type	Null	Key	Default	Extra
►	CustomerID	int	YES		NULL	
	Name	text	YES		NULL	
	Address	text	YES		NULL	

Order_Details Tables

	Field	Type	Null	Key	Default	Extra
►	OrderDetailID	int	YES		NULL	
	OrderID	int	YES		NULL	
	ProductID	int	YES		NULL	
	Quantity	int	YES		NULL	
	PriceEach	double	YES		NULL	
	TotalPrice	double	YES		NULL	

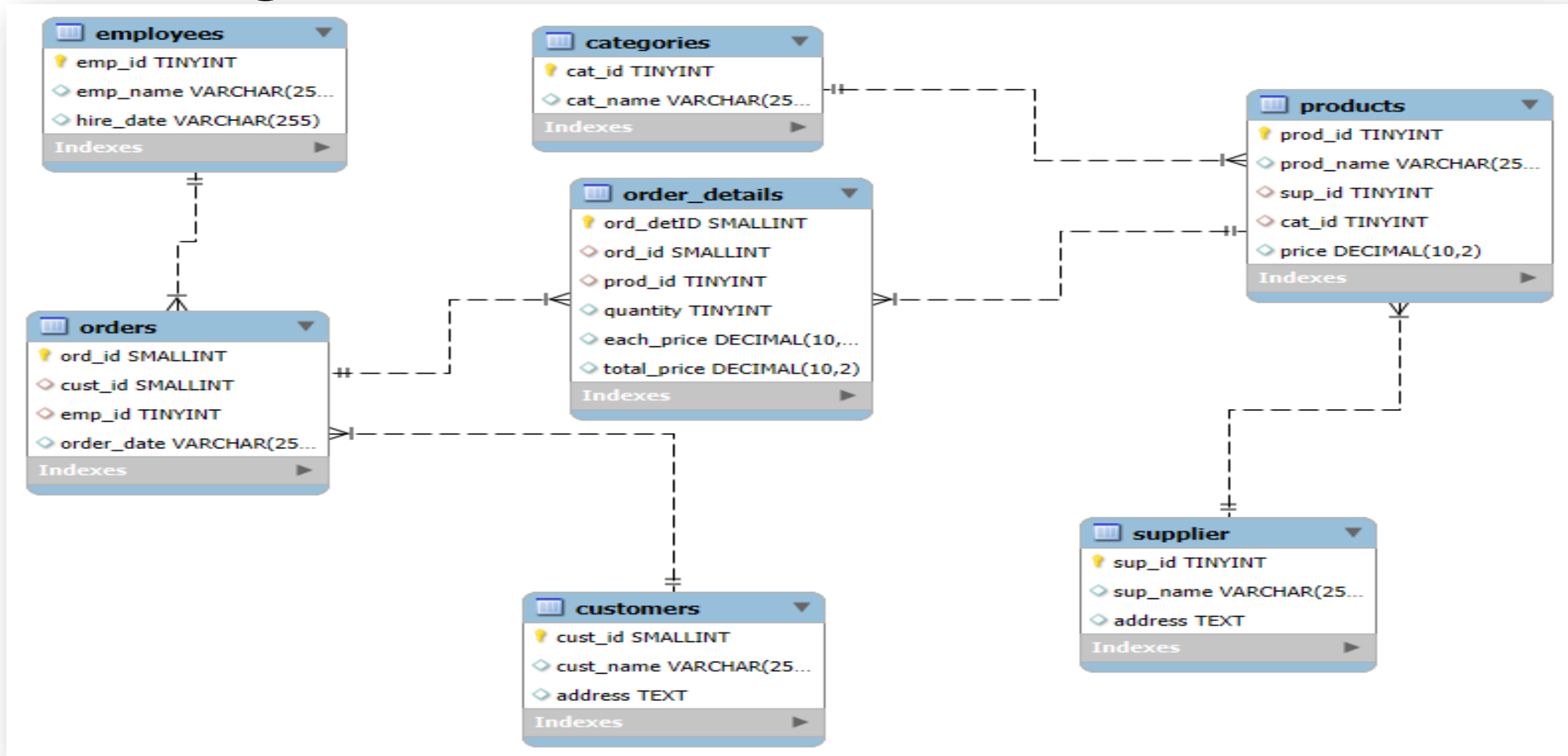
ORDER TABLES

	Field	Type	Null	Key	Default	Extra
►	OrderID	int	YES		NULL	
	CustomerID	int	YES		NULL	
	EmployeeID	int	YES		NULL	
	OrderDate	text	YES		NULL	

STORE EMPLOYEE TABLES

	Field	Type	Null	Key	Default	Extra
►	EmployeeID	int	YES		NULL	
	Name	text	YES		NULL	
	HireDate	text	YES		NULL	

ER Diagram:



Problem Statement:

- In today's grocery retail stores, managing and analyzing large amounts of data related to inventory, suppliers, customers, and transactions is vital for smooth operations and informed decision-making.

This project aims to create a relational database system that stores, organizes, and processes key store activities. It will also enable effective data retrieval and analysis using SQL. Users will be able to run complex SQL queries to discover valuable business insights, such as identifying best-selling items, loyal customers, and sales trends over time.

- The project also focuses on improving practical SQL skills through techniques like joins, aggregations, subqueries, and filtering to aid data-driven decision-making and enhance operational efficiency.

1. How many unique customers have placed orders?

```
SELECT COUNT(DISTINCT CustomerID) AS UniqueCustomers  
FROM Orders;
```



	UniqueCustomers
▶	156

2. Which customers have placed the highest number of orders?

```
select c.customerid,c.name,count(o.orderid) as orders_count
from customers c
join orders o on c.customerid = o.customerid
group by c.customerid,c.name
order by orders count desc;
```

	customerid	name	orders_count
▶	165	Jyotika	7
	61	Aditi Rao	6
	128	Hari Naidu	5
	195	Amit Saxena	5
	32	Eshwar Menon	5
	145	Chetan Rao	5
	19	Chetan Naidu	5
	166	Kapila	4
	3	Chetan Rao	4
	114	Isha Shetty	4
	7	Eshwar Iyer	4
	120	Kiran Iyer	4
	26	Deepa Reddy	3
	116	Jaya Reddy	3
	160	Hari Naidu	3
	33	Hari Rao	3
	113	Chetan Nair	3
	8	Deepa Reddy	3
	51	Kiran Iyer	3
	56	Eshwar Rao	3
	67	Eshwar Rao	3
	39	Jaya Krishnan	3
	146	Deepa Naidu	3
	31	Hari Rao	3
	124	Jaya Nair	3
	148	Chetan Iyer	3

3.What is the total and average purchase value per customer?

```
SELECT
    c.customerid,
    c.name,
    SUM(od.totalprice) AS total_purchase_value,
    AVG(od.totalprice) AS average_purchase_value
FROM customers c
JOIN orders o
    ON c.customerid = o.customerid
JOIN orderdetails od
    ON o.orderid = od.orderid
GROUP BY c.customerid, c.name
ORDER BY total_purchase_value DESC;
```

	customerid	name	total_purchase_value	average_purchase_value
▶	19	Chetan Naidu	11256.81340711334	1125.681340711334
	166	Kapila	11099.520581048373	1109.9520581048373
	67	Eshwar Rao	10819.967618565575	901.663968213798
	61	Aditi Rao	10230.647081383104	1023.0647081383104
	7	Eshwar Iyer	9188.45721606837	656.3183725763121
	160	Hari Naidu	8686.881141151629	965.2090156835143
	188	Preeti Malhotra	8496.636232808218	944.0706925342464
	195	Amit Saxena	8266.349648094643	1180.907092584949
	165	Jyotika	8228.92828523932	632.9944834799478
	174	Komal	8182.598879743081	1022.8248599678851
	8	Deepa Reddy	7929.125254376324	881.0139171529249
	114	Isha Shetty	7838.147878104371	1306.3579796840618
	3	Chetan Rao	7693.423445898336	854.8248273220373
	148	Chetan Iyer	7645.348362608112	1092.1926232297303
	186	Neha Joshi	7614.437038677033	1522.8874077354067
	75	Chetan Gowda	7611.084148337338	951.3855185421672
	135	Kiran Naidu	7551.315855817344	1258.552642636224
	170	Khushbu	7290.785454787246	1215.1309091312075
	146	Deepa Naidu	7024.065398891157	1003.4379141273082
	128	Hari Naidu	6781.339033247325	678.1339033247325
	161	Jivathran	6684.985850348501	1336.9971700697001
	31	Hari Rao	6624.788963849517	662.4788963849517
	94	Gita Menon	6581.933499721035	731.3259444134484
	32	Eshwar Menon	6552.384036340996	936.0548623344281
	72	Jaya Nair	6383.283391891917	1276.6566783783833
	125	Gita Nair	6305.088429856438	1261.0176859712876

4. Who are the top 5 customers by total purchase amount?

```
select c.customerid,c.name,sum(od.totalprice) as total
from customers c
join orders o on c.customerid = o.customerid
join orderdetails od on o.orderid = od.orderid
group by c.customerid,c.name
order by total_spent desc
limit 5;
```



	customerid	name	total_spent
▶	19	Chetan Naidu	11256.81340711334
	166	Kapila	11099.520581048373
	67	Eshwar Rao	10819.967618565575
	61	Aditi Rao	10230.647081383104
	7	Eshwar Iyer	9188.45721606837

5. How many products exist in each category?

	categoryname	product_count
►	Grains & Cereals	18
	Dairy Products	6
	Snacks & Confectioneries	17
	Personal Care	6
	Household	3

```
select cat.categoryname, count(p.productid) as product_count
from categories cat
left join products p on cat.categoryid = p.categoryid
group by cat.categoryname;
```

6. What is the average price of products by category?

```
select cat.categoryname, avg(p.price) as avg_price
from categories cat
join products p on cat.categoryid = p.categoryid
group by cat.categoryname;
```

	categoryname	avg_price
▶	Grains & Cereals	287.67326207777774
	Dairy Products	366.94369421666664
	Snacks & Confectioneries	278.8934064129412
	Household	363.33601913333337
	Personal Care	364.99154823333333



7. Which products have the highest total sales volume (by quantity)?

	name	total_qty
▶	Bath Soap	60
	Hand Sanitizer	56
	Dishwashing Soap	54
	Biscuits	54
	Potato Chips	54
	Moong Dal	51
	Chapati	50
	Cumin Seeds	46
	Mustard Seeds	45
	Facial Tissue	45
	Toothpaste	44
	Mayonnaise	43
	Cashews	42
	Brown Bread	42
	Cheese Slices	42
	Butter	41
	Red Chili Powder	40
	Turmeric Powder	39
	Wheat Flour	38
	White Bread	38
	Jaggery	37
	Mango Pickle	37
	Cinnamon Sticks	37
	Black Pepper	36
	Tomato Ketchup	35
	Green Tea	35

```
select p.name, sum(od.quantity) as total_qty
from products p
join orderdetails od on p.productid = od.productid
group by p.name
order by total_qty desc;
```





```
select p.name, sum(od.totalprice) as revune
from products p
join orderdetails od on p.productid = od.productid
group by p.name
order by revune desc;
```

	name	revune
▶	Hand Sanitizer	27787.7375380624
	Biscuits	20995.91542113018
	Moong Dal	19695.000539642097
	Toothpaste	19688.915112007253
	Mustard Seeds	19516.681792541927
	Cashews	18561.951841182195
	Butter	18548.43469889168
	Cheese Slices	18519.611222304677
	Turmeric Powder	17784.28916623548
	Soya Sauce	16985.373678400047
	Toilet Cleaner	16776.93114379072
	White Bread	16576.188568069545
	Paneer	15980.833408960965
	Detergent Powder	14848.704522101772
	Brown Bread	14538.060960123265
	Mouth wash	14537.135849234472
	Chocolate Bar	14278.168393836675
	Bath Soap	14112.984518210824
	Ghee	13161.288620246347
	Basmati Rice	11487.50885594245
	Tomato Ketchup	11283.918701633222
	Mayonnaise	11100.472261245737
	Conditioner	10949.853068835755
	Masala Tea	10283.024107008245
	Shampoo	10132.77932605984
	Chapati	10084.100648388700

8.What is the total revenue generated by each product?

9.How do product sales vary by category and supplier?

```
select c.categoryname,s.suppliername,  
sum(od.quantity) as qty_sold,  
sum(od.totalprice) as total_revune  
from products p  
join categories c on p.categoryid = c.categoryid  
join suppliers s on p.supplierid = s.supplierid  
join orderdetails od on p.productid = od.productid  
group by c.categoryname, s.suppliername  
order by total_revune desc;
```

	categoryname	suppliername	qty_sold	total_revune
►	Personal Care	Aarya	205	69378.3449114391
	Grains & Cereals	Aarya	226	67701.12114267625
	Snacks & Confectioneries	Aarya	196	65538.72632937467
	Snacks & Confectioneries	Suresh	272	65307.18296356301
	Dairy Products	Sai	121	50740.621495369945
	Grains & Cereals	Karthik	140	39473.49444946641
	Snacks & Confectioneries	Aarav Sharma	82	26948.17217315072
	Grains & Cereals	Suresh	67	26248.873655213643
	Household	Karthik	86	22767.542692147545
	Dairy Products	Aarya	42	18519.611222304677
	Grains & Cereals	Sai	75	18017.97092319238
	Snacks & Confectioneries	Sai	70	17103.164666122644
	Household	Sai	35	16776.93114379072
	Dairy Products	Karthik	43	11100.472261245737
	Personal Care	Sai	23	10949.853068835755
	Personal Care	Suresh	28	10132.77932605984
	Snacks & Confectioneries	Karthik	27	8520.423896711907
	Grains & Cereals	Aarav Sharma	34	6104.715663493892

10. How many orders have been placed in total?

```
SELECT COUNT(*) AS TotalOrders  
FROM Orders;
```



	TotalOrders
▶	300



11.What is the average value per order?

```
SELECT AVG(OrderTotal) AS AvgOrderValue
FROM (
    SELECT orderid, SUM(totalprice) AS OrderTotal
    FROM orderdetails
    GROUP BY orderid)
AS OrderValues;
```



	Field	Type	Null	Key	Default	Extra
►	OrderDetailID	int	YES		NULL	
	OrderID	int	YES		NULL	
	ProductID	int	YES		NULL	
	Quantity	int	YES		NULL	
	PriceEach	double	YES		NULL	
	TotalPrice	double	YES		NULL	

12. On which dates were the most orders placed?



```
SELECT orderdate, COUNT(*) AS TotalOrders
FROM orders
GROUP BY orderdate
ORDER BY TotalOrders DESC;
```

	AvgOrderValue
▶	2153.63282025062

13. What are the monthly trends in order volume and revenue?

```
SELECT left(o.orderdate,7) as orderMonth,  
       COUNT(DISTINCT o.orderid) AS order_volume,  
       SUM(od.quantity * od.priceeach) AS TotalRevenue  
FROM orders o  
JOIN orderdetails od ON o.orderid = od.orderid  
GROUP BY orderMonth  
ORDER BY orderMonth;
```

	orderdate	TotalOrders
►	9/10/2022	4
	3/30/2022	4
	1/30/2022	3
	4/22/2022	3
	1/14/2022	3
	10/23/2022	3
	12/5/2022	3
	5/24/2022	3
	1/16/2022	3
	6/27/2022	3
	12/21/2022	3
	1/28/2022	3
	12/6/2022	3
	7/5/2022	3
	10/19/2022	3
	9/25/2022	3
	9/23/2022	3
	7/30/2022	3
	2/27/2022	3
	2/13/2022	3
	7/2/2022	2
	11/25/2022	2
	5/4/2022	2
	3/3/2022	2
	11/30/2022	2
	6/18/2022	2

14.How do order patterns vary across weekdays and months?

```
SELECT
CASE
    WHEN DAYOFWEEK(STR_TO_DATE(orderdate, '%Y-%m-%d')) IN (1,7) THEN 'Weekend'
    ELSE 'Weekday'
END AS DayType,
COUNT(*) AS TotalOrders
FROM orders
GROUP BY DayType;
```



	orderMonth	order_volume	TotalRevenue
▶	1/1/202	1	711.7337763654041
	1/10/20	1	133.509371642973
	1/11/20	2	2217.1671727184425
	1/12/20	1	3489.711438343752
	1/14/20	2	3333.206112625238
	1/15/20	1	5252.280909402865
	1/16/20	3	6340.929931799683
	1/18/20	1	1449.5748893116331
	1/22/20	1	2168.5201991713247
	1/23/20	2	3957.098409848345
	1/24/20	2	7187.7236988635195
	1/25/20	1	3485.79268361059
	1/28/20	3	4703.030318201322
	1/30/20	2	7433.693569552557
	1/31/20	1	3125.6855160109135
	1/5/202	2	5466.544697263738
	1/6/202	1	1944.066242697239
	1/7/202	2	5553.9121443626045
	1/8/202	1	2358.3066836309554
	10/10/2	2	2378.376234276377
	10/14/2	1	1667.049973425815
	10/19/2	2	7406.598283356988
	10/2/20	1	2069.6469592101294
	10/20/2	1	1525.6681673962153
	10/23/2	1	3068.3064220874776
	10/24/2	1	2320.6018341487147

15.How many suppliers are there in the database?

```
SELECT COUNT(*) AS TotalSuppliers  
FROM suppliers;
```

	DayType	TotalOrders
▶	Weekday	300



16. Which supplier provides the most products?

```
SELECT s.supplierid, s.suppliername, COUNT(p.productid) AS ProductCount
FROM suppliers s
JOIN products p ON s.supplierid = p.supplierid
GROUP BY s.supplierid, s.suppliername
ORDER BY ProductCount DESC
LIMIT 1;
```



	TotalSuppliers
▶	5

17. What is the average price of products from each supplier?

```
SELECT s.supplierid, s.suppliername, AVG(p.price) AS AvgProductPrice  
FROM suppliers s  
JOIN products p ON s.supplierid = p.supplierid  
GROUP BY s.supplierid, s.suppliername  
ORDER BY AvgProductPrice DESC;
```



	supplierid	suppliername	ProductCount
▶	3	Aarya	18

18. Which suppliers contribute the most to total product sales (by revenue)

```
SELECT s.supplierid, s.suppliername,  
       SUM(od.totalprice) AS TotalRevenue  
FROM suppliers s  
JOIN products p ON s.supplierid = p.supplierid  
JOIN orderdetails od ON p.productid = od.productid  
GROUP BY s.supplierid, s.suppliername  
ORDER BY TotalRevenue DESC;
```

	supplierid	suppliername	AvgProductPrice
►	2	Sai	342.67186315000004
	3	Aarya	319.32674083999996
	5	Karthik	288.22674025555557
	4	Suresh	281.81799177
	1	Aarav Sharma	271.36853063333336

19. How many employees have processed orders?

```
SELECT COUNT(DISTINCT employeeid) AS ActiveEmployees  
FROM orders;
```



	supplierid	suppliername	TotalRevenue
▶	3	Aarya	221137.80360579453
	2	Sai	113588.54129731141
	4	Suresh	101688.83594483654
	5	Karthik	81861.93329957161
	1	Aarav Sharma	33052.887836644615

20. Which employees have handled the most orders?

```
SELECT e.employeeid, e.name,  
       COUNT(DISTINCT o.orderid) AS OrdersHandled  
FROM store_employees e  
JOIN orders o ON e.employeeid = o.employeeid  
GROUP BY e.employeeid, e.name  
ORDER BY OrdersHandled DESC;
```

	ActiveEmployees
▶	10



21. What is the total sales value processed by each employee?

```
SELECT e.employeeid, e.name,  
       SUM(od.totalprice) AS TotalSales  
FROM store_employees e  
JOIN orders o ON e.employeeid = o.employeeid  
JOIN orderdetails od ON o.orderid = od.orderid  
GROUP BY e.employeeid, e.name  
ORDER BY TotalSales DESC;
```

	employeeid	name	OrdersHandled
▶	8	Diya Sharma 1	38
	2	Aditya Singh 1	37
	9	Arjun Kumar 1	32
	3	Pari Kumar 1	31
	5	Pari Sharma 1	31
	6	Zara Verma 1	30
	7	Vihaan Singh 1	29
	4	Aditya Verma 1	26
	1	Aarav Kumar 1	23
	10	Arjun Verma 1	23

22. What is the average order value handled per employee?

```
SELECT e.employeeid, e.name,  
       AVG(Ordervalue) AS AvgOrderValue  
FROM store_employees e  
JOIN orders o ON e.employeeid = o.employeeid  
JOIN (  
    SELECT orderid, SUM(totalprice) AS OrderValue  
    FROM orderdetails  
    GROUP BY orderid  
) AS OrderVals ON o.orderid = OrderVals.orderid  
GROUP BY e.employeeid, e.name  
ORDER BY AvgOrderValue DESC;
```

	employeeid	name	TotalSales
▶	2	Aditya Singh 1	79252.27287503115
	6	Zara Verma 1	71562.77735649435
	8	Diya Sharma 1	67241.86324808231
	3	Pari Kumar 1	66818.37989874712
	9	Arjun Kumar 1	54018.34636253491
	1	Aarav Kumar 1	52602.86326421212
	7	Vihaan Singh 1	48577.903053390895
	5	Pari Sharma 1	40334.23183705283
	10	Arjun Verma 1	36716.86024034629
	4	Aditya Verma 1	34204.5038482668



23.What is the relationship between quantity ordered and total price?

```
SELECT quantity, totalprice  
FROM orderdetails;
```



	employeeid	name	AvgOrderValue
▶	1	Aarav Kumar 1	2768.5717507480063
	6	Zara Verma 1	2650.473235425717
	2	Aditya Singh 1	2330.949202206798
	3	Pari Kumar 1	2227.2793299582377
	7	Vihaan Singh 1	2112.082741451778
	9	Arjun Kumar 1	2077.628706251343
	8	Diya Sharma 1	2037.632219638858
	10	Arjun Verma 1	1835.8430120173139
	5	Pari Sharma 1	1833.374174411492
	4	Aditya Verma 1	1554.7501749212183

24.What is the average quantity ordered per product?

```
SELECT p.productid, p.name, AVG(od.quantity) AS AvgQuantity
FROM products p
JOIN orderdetails od ON p.productid = od.productid
GROUP BY p.productid, p.name
ORDER BY AvgQuantity DESC;
```



	quantity	totalprice
▶ 3	421.8730667665053	
1	441.95123431386185	
4	665.0566816559334	
2	438.72556818609223	
4	1544.7059246778117	
4	586.5806051885759	
3	1392.0660489470413	
1	322.39767718952066	
3	548.2238984786811	
1	386.1764811694529	
4	940.8656345473883	
3	774.4515531101678	
1	179.55046069099683	
3	705.6492259105412	
4	1032.602070813557	
4	1949.8205363327922	
1	201.6839929677742	
4	898.2703128933596	
4	1856.0880652627218	
5	1944.066242697239	
1	476.0805682102502	
5	2396.7044491129595	
2	510.9984488909899	
3	518.4230963053046	
2	440.1351564466708	

25.How does the unit price vary across products and orders?

```
SELECT p.productid, p.name, od.eachprice  
FROM products p  
JOIN orderdetails od ON p.productid = od.productid  
ORDER BY p.name, od.eachprice;
```



	productid	name	AvgQuantity
▶	40	Butter	4.5556
	31	Toothpaste	3.6667
	46	Potato Chips	3.6000
	42	Tomato Ketchup	3.5000
	22	Mustard Seeds	3.4615
	3	Moong Dal	3.4000
	6	Ghee	3.3750
	9	Mango Pickle	3.3636
	32	Bath Soap	3.3333
	45	Chili Sauce	3.2500
	18	Salt	3.2500
	34	Facial Tissue	3.2143
	1	Basmati Rice	3.2000
	26	Detergent Pow...	3.2000
	35	Mouth wash	3.2000
	16	Sugar	3.2000
	13	Green Tea	3.1818
	49	Instant Noodles	3.1818
	47	Chocolate Bar	3.1818
	48	Biscuits	3.1765
	36	Chapati	3.1250
	17	Jaggery	3.0833
	20	Red Chili Powder	3.0769
	21	Cumin Seeds	3.0667
	27	Dishwashing Soap	3.0000
	7	Paneer	3.0000

Conclusion:

The project maximizes the administration and analysis of grocery store information.

Database design maximizes the storage and administration of vital business data.

SQL queries facilitate data-driven insight and smarter decision-making.

Exposes top-performing products and repeat customers.

Maximizes inventory management and supplier handling.

Enhances sales performance and customer satisfaction.

Minimizes wastage and maximizes overall operational efficiency.

Illustrates the relevance of data analysis to the contemporary retail enterprise.

THANK
YOU



Group Members:

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