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INNOVATION. AUTOMATION. ANALYTICS

Grocery Store Management
SQL Project

About me

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(B.sc in Animation and vfx - 2020)

I have 4 years of experience as a CG Texturing Artist, where I developed strong skills in precision and detail. Seeking a stable, growth-oriented career, I transitioned into data analytics and look forward to applying my analytical mindset to identify opportunities and drive positive outcomes.

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Objective of the Project

The main goals of this SQL project are to build practical database management and analysis skills:

Design & Implementation

Design and implement a relational database for a grocery store

Data Manipulation

Retrieve and manipulate data using SQL queries

Business Analysis

Perform data analysis for insights on customers, products, and revenue trends

Technical Practice

Practice using joins, aggregations, subqueries and filtering techniques

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ER Diagram & Schema Explanation

This ER Diagram represents the **Grocery Store Management Database**, showing how all 7 tables are connected to manage customers, products, orders, suppliers, and employees.

Supplier → Products
One supplier can provide many products.

Categories → Products
One category can contain many products.

Products → Order_Details
One product can appear in many order records.
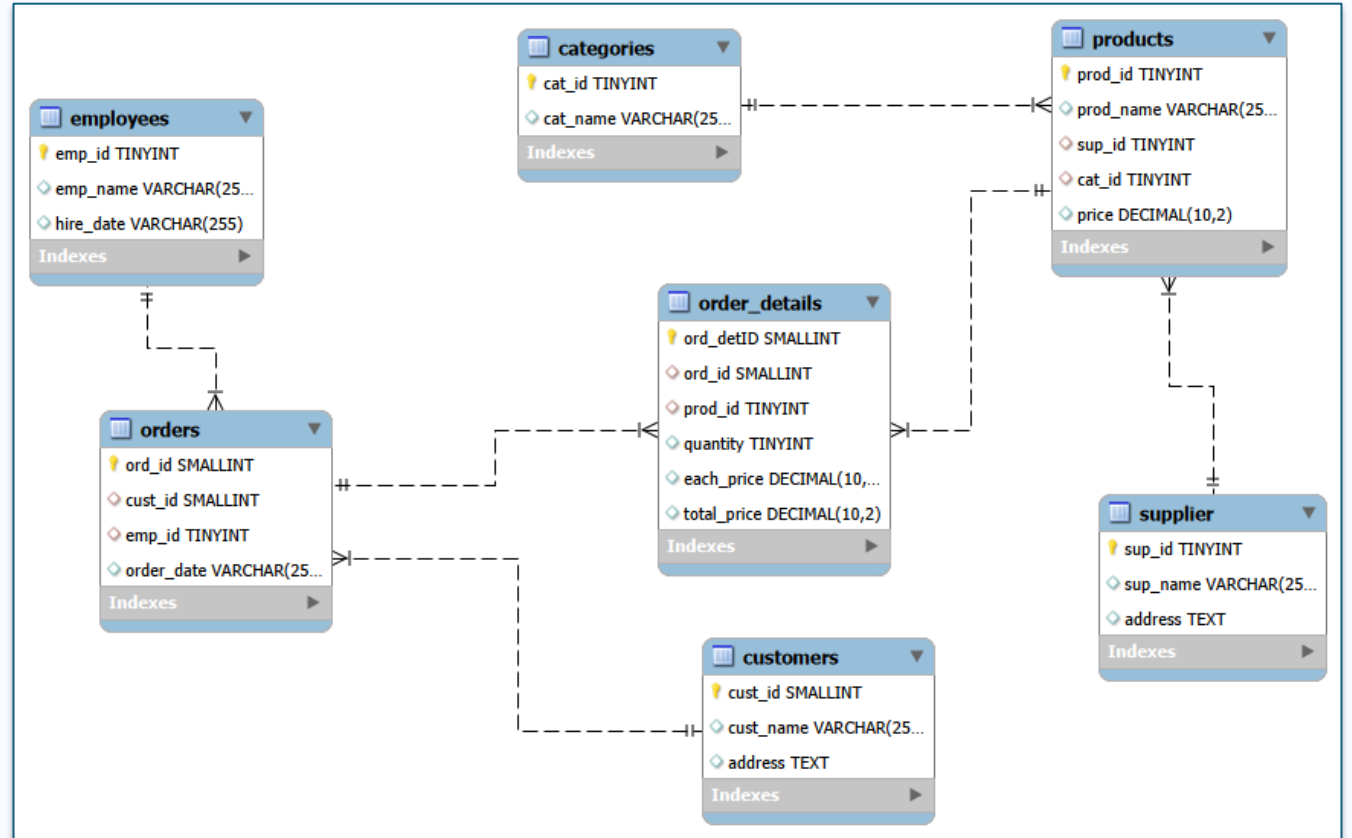
Orders → Order_Details
One order can have multiple items.

Customers → Orders
One customer can place many orders.

Employees → Orders
One employee can handle many customer orders.

Schema Highlight:

I used auto-increment primary keys and cascade foreign key rules to maintain consistency.

Key Analysis Questions (Use Cases) :

Customer Insights

- Understand how customers behave and contribute to sales.
- This includes finding how many customers buy, who buys the most, and how much they usually spend.

Supplier Contribution

- Evaluate which suppliers contribute most to the inventory and revenue.
- We look at number of suppliers, how many products each supplies, and sales generated from their products.

Sales and Order Trends

- Study overall sales activity over time.
- Identify total orders, daily/monthly trends, peak sales dates, and order patterns across weekdays/weekends.

Product Performance

- Analyze which products and categories perform well.
- Check product counts, pricing, top-selling items, and the products that generate the highest revenue.

Employee Performance

- Check how employees handle orders.
- We analyze how many orders each employee manages, total sales processed, and average order value per employee.

Order Details Deep Dive

- Explore detailed item-level patterns.
- We understand quantity-price relationships, average quantity per product, and how unit prices vary across orders.

SQL Queries & Summaries

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

```
select c.cust_name,count(o.ord_id) as total_orders
from customers c
join orders o on c.cust_id = o.cust_id
group by c.cust_id
order by total_orders desc limit 1;
```

	cust_name	total_orders
▶	Jyotika	7

Summary :

The data shows that **Jyotika** is the customer with the **highest number of orders**, placing a total of **7 orders**. This indicates she is the **most frequent and active buyer** among all customers.

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

```sql
select c.cust_name, sum(od.total_price) as total_purchase
from customers c
join orders o on c.cust_id = o.cust_id
join order_details od on o.ord_id = od.ord_id
group by c.cust_id
order by total_purchase desc
limit 5;
```

cust_name	total_purchase
Chetan Naidu	11256.82
Kapila	11099.51
Eshwar Rao	10819.96
Aditi Rao	10230.64
Eshwar Iyer	9188.45

Summary :

The top 5 customers with the highest total purchase amounts are **Chetan Naidu**, **Kapila**, **Eshwar Rao**, **Aditi Rao**, and **Eshwar Iyer**. Among them, **Chetan Naidu** has spent the most, followed closely by **Kapila**. These customers contribute the largest share of total sales.

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3. How many products exist in each category?

```sql
select cat.cat_name,count(p.prod_id) as product_count
from categories cat
left join products p on cat.cat_id = p.cat_id
group by cat.cat_id
order by product_count desc;
```

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

Summary :

The product distribution shows that **Grains & Cereals** has the highest number of products (18), followed closely by **Snacks & Confectioneries** with 17 items. **Dairy Products** and **Personal Care** each have 6 products, while **Household** has the lowest count with just 3. This indicates that essential food categories carry the widest variety in the store.

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

```sql
select p.prod_name,sum(od.quantity) as total_quantity_sold
from products p
join order_details od on p.prod_id = od.prod_id
group by p.prod_id
order by total_quantity_sold desc limit 10;
```

prod_name	total_quantity_sold
Bath Soap	60
Hand Sanitizer	56
Dishwashing Soap	54
Biscuits	54
Potato Chips	54
Moong Dal	51
Chapati	50
Cumin Seeds	46
Facial Tissue	45
Mustard Seeds	45

Summary :

Bath Soap has the highest sales volume with **60 units** sold, followed by Hand Sanitizer (56 units). Dishwashing Soap, Biscuits, and Potato Chips each sold 54 units, while other products like Moong Dal, Chapati, Cumin Seeds, Facial Tissue, and Mustard Seeds also show strong sales.

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

```sql
select date_format(o.order_date,'%Y-%m') as month,

count(distinct o.ord_id) as total_orders,

sum(od.total_price) as total_revenue

from orders o

join order_details od on o.ord_id = od.ord_id

group by month

order by month;
```

month	total_orders	total_revenue
2022-01	30	70312.45
2022-02	28	66929.42
2022-03	27	45977.16
2022-04	11	29118.54
2022-05	19	41305.62
2022-06	14	27378.69
2022-07	21	48674.66
2022-08	20	36045.01
2022-09	23	52626.61
2022-10	12	25917.32
2022-11	19	46141.33
2022-12	32	60903.12

Summary :

This data shows that monthly orders and revenue remain mostly steady throughout the year, with the highest sales occurring in January and December. April, June, and October have the lowest activity, while the remaining months fall within a moderate range.

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6. Which supplier provides the most products?

```sql
select s.sup_name,count(p.prod_id) as product_count
from supplier s
join products p on s.sup_id =p.sup_id
group by s.sup_id
order by product_count desc;
```

sup_name	product_count
Aarya	18
Sai	10
Suresh	10
Karthik	9
Aarav Sharma	3

Summary :

This data shows that **Aarya** supplies the highest number of products, with a total of **18** items. **Sai** and **Suresh** follow with **10** products each, while **Karthik** and **Aarav Sharma** supply fewer items. Overall, **Aarya** is the leading supplier in terms of product variety.

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

```sql
select e.emp_name, sum(od.total_price) as total_sales
from employees e
join orders o on e.emp_id = o.emp_id
join order_details od on o.ord_id = od.ord_id
group by e.emp_id
order by total_sales desc;
```

emp_name	total_sales
Aditya Singh	79252.29
Zara Verma	71562.76
Diya Sharma	67241.85
Pari Kumar	66818.39
Arjun Kumar	54018.31
Aarav Kumar	52602.88
Vihaan Singh	48577.88
Pari Sharma	40334.22
Arjun Verma	36716.84
Aditya Verma	34204.51

Summary :

This data shows that **Aditya Singh** handled the highest total sales, followed by **Zara Verma** and **Diya Sharma**. The remaining employees also contributed steadily, but **Aditya Singh** stands out as the top-performing employee in terms of total sales handled.

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Final Business Insights & Recommendations

Insights :

- A few customers and products generate most of the revenue.

- Monthly sales peak in **Jan, Feb, and Dec** and dip around **April & October**.

- Certain suppliers contribute more high-selling products.

- Some employees handle the majority of orders and revenue.

- Quantity and total price increase together, showing strong demand patterns.

Recommendations :

- Focus on high-value customers with offers/loyalty.

- Stock and promote best-selling products.

- Run sales campaigns during low-performing months.

- Strengthen partnerships with top suppliers.

- Train or support employees with lower performance.

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Experience & Challenges

Understanding Database Structure

- Learned how to design tables with primary & foreign keys.
- Understood relationships across 7 interconnected tables (customers, orders, products, etc.).

Data Cleaning & Formatting

- Faced issues with inconsistent date formats and cleaned them using **str_to_date().**
- Removed unwanted characters from employee names and standardized data.

Working With Joins & Aggregations

- Writing multi-table joins (3–4 tables) was challenging initially.
- Improved skills in using **group by, count, sum,** and nested subqueries for analysis.

Handling Business Analysis Queries

- Extracting monthly and weekly trends required deeper understanding of date functions.
- Learned how to convert raw data into actionable insights (top customers, revenue, sales trends).

Conclusion

➤ Successfully designed and implemented a complete grocery store database.

➤ Performed SQL queries to analyze customers, products, suppliers, employees, and sales trends.

➤ Identified high-value customers, best-selling products, and monthly revenue patterns.

➤ Understood how joins, aggregations, and subqueries help answer real business questions.

➤ Improved skills in data cleaning, date handling, and multi-table analysis.

➤ Gained confidence in using SQL for data-driven decision-making.