

# Retail Sales Data Analysis Project

## Project Objective

To analyze a retail sales dataset using SQL in order to uncover meaningful business insights, identify customer purchasing behaviors, and support data-driven decision-making.

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## Database Design & Setup

- Created and structured the retail\_sales table to include key transactional fields such as transaction\_id, sale\_date, customer\_id, category, quantity, price\_per\_unit, and total\_sale.
  - Ensured proper data types for efficient storage and accurate querying.
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## Data Cleaning

- Identified and removed null values from critical columns to ensure data integrity.
  - Ensured consistency in data types and categorical values (e.g., category, gender).
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## Exploratory Data Analysis (EDA)

- Determined total number of sales and unique customers.
  - Identified all unique product categories available in the dataset.
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## Key Analytical Insights Using SQL

### 1. Date-Based Filtering:

Queried sales for a specific date (2022-11-05) and filtered transactions for the month of November 2022 in specific categories (e.g., Clothing).

### 2. Category & Customer Insights:

- Calculated total sales per product category.
- Found average age of customers for specific product categories (e.g., Beauty).
- Identified top 5 high-value customers based on total purchases.

### 3. Sales Performance:

- Detected transactions with high sales (`total_sale > 1000`).
- Identified the best-performing month in each year using `RANK()` window function.

### 4. Customer Demographics & Behavior:

- Analyzed sales distribution by gender and category.
- Segmented sales by shift (Morning, Afternoon, Evening) based on `sale_time`.

### 5. Engagement Metrics:

- Counted unique customers per category.
- Summarized number of transactions across gender-category combinations.

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## **Outcomes**

- Enabled segmentation of customer behavior by time of day and category.
- Identified high-value customers and product categories.
- Generated actionable insights for retail strategy optimization and targeted marketing.