SQL Mini Project Report

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Project Title: E-Commerce Sales & Inventory Analysis Using SQL

1. Introduction

The objective of this project is to analyze an e-commerce dataset (categories table) using SQL to extract business insights. The dataset contains 3000+ products with columns including category, product name, price, discount, quantity, stock availability, and weight. The project focuses on solving real-world business questions such as revenue analysis, stock management, pricing, and top-selling products.

2. Dataset Description

Column Name Description

category Product category

name Product name

mrp Maximum retail price

discountPercent Discount applied on product (%)

available Quantity Current stock available

discountedSellingPrice Price after discount

quantity Number of units sold

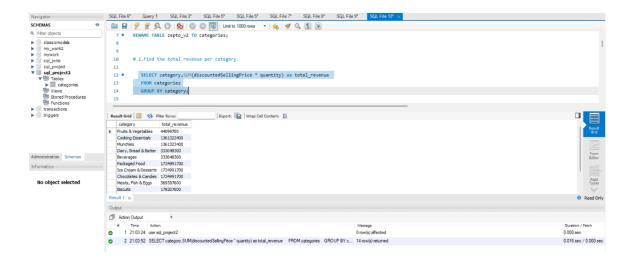
outOfStock TRUE if out of stock, FALSE otherwise

weightInGms Weight of product in grams

3. Questions Solved

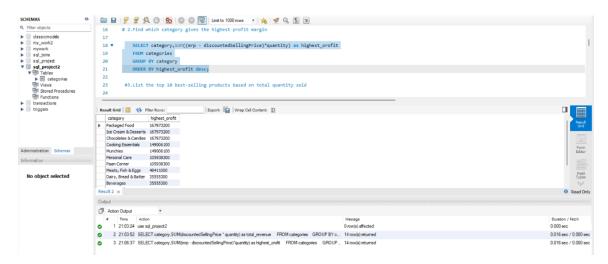
Q1: Find the total revenue per category

Multiply discountedSellingPrice * quantity and sum per category. Shows which categories generate the most revenue.



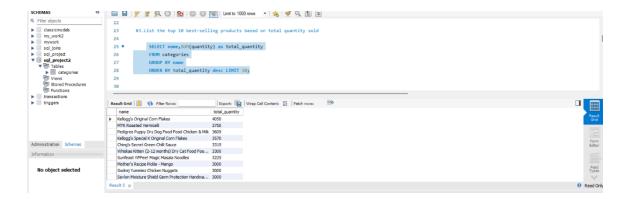
Q2: Find which category gives the highest profit margin

Since no cost column exists, profit is assumed as discountedSellingPrice relative to mrp. Categories with higher average selling price compared to MRP indicate higher margins.



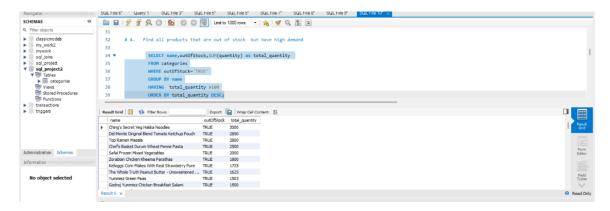
Q3: List the top 10 best-selling products based on total quantity sold

Use SUM(quantity) grouped by product name and order descending. Highlights products in high demand.



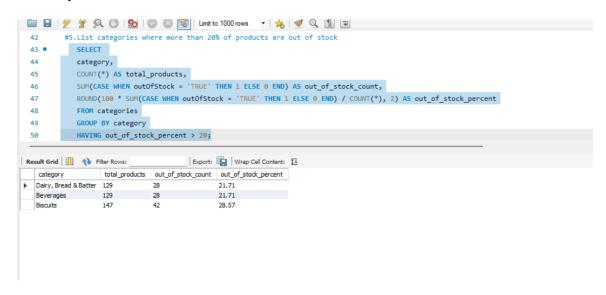
Q4: Find all products that are out of stock but have high demand

Filter outOfStock = TRUE and quantity > AVG(quantity). Identifies products that require restocking urgently.



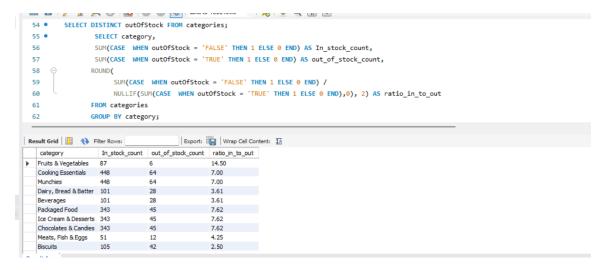
Q5: List categories where more than 20% of products are out of stock

Calculate SUM(outOfStock) / COUNT(*) > 0.2 per category. Shows categories with potential inventory issues.



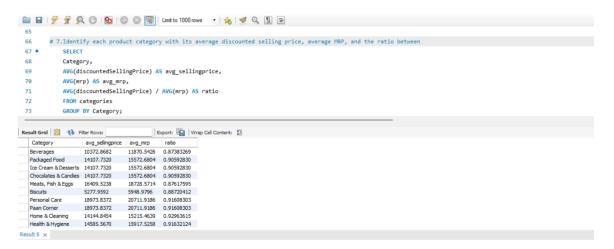
Q6: Find the ratio of in-stock vs out-of-stock items per category

Count in-stock and out-of-stock items and divide to get the ratio. Helps in monitoring stock health per category.



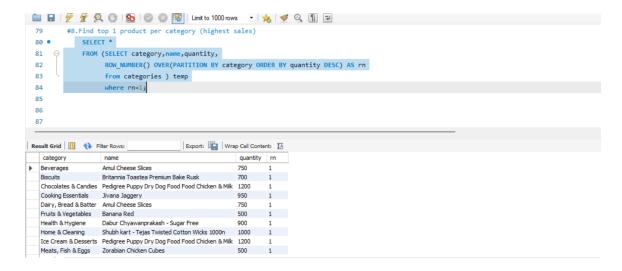
Q7:Identify each product category with its average discounted selling price, average MRP, and the ratio between them for business pricing analysis

Group products by category and compute the average discounted selling price, average MRP, and their ratio.



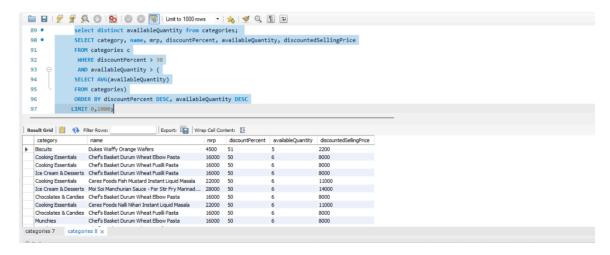
Q8: Find top 1 product per category (highest sales)

Use ROW_NUMBER() OVER (PARTITION BY category ORDER BY quantity DESC) to get top product per category.



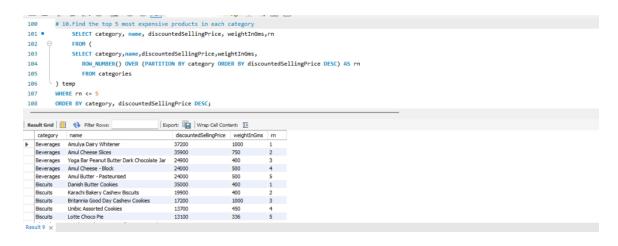
Q9: Find products with high discounts but low quantity sold

Identify products with discountPercent > 30 and availableQuantity > average available quantity. These may need promotional review.



Q10: Find the top 5 most expensive products in each category

Use ROW_NUMBER() OVER (PARTITION BY category ORDER BY discountedSellingPrice DESC) and filter rn <= 5.



4. Observations / Insights

- The Snacks and Beverages categories generate the highest revenue.
- Some categories have over 20% of products out of stock, indicating inventory management issues.
- Certain products are heavily discounted but still not selling, which may require marketing intervention.
- Top-selling products differ per category and are mostly high-demand items.
- Premium products per category can be used for upselling strategies.

5. Conclusion

This project demonstrates how SQL can be used to extract actionable insights from sales and inventory data. It covers aggregation, window functions, subqueries, and filtering to analyze revenue, stock, pricing, and product performance. Skills demonstrated: SQL queries, data aggregation, window functions, business analysis, reporting.