VICTORIA SOLUTIONS
CONSULTING GROUP

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Project Title (Example – Week1, Week2, Week3)	Week_2 Data_Analysis_Sales

Introduction

In today's competitive business landscape, understanding sales performance is crucial for driving growth and maintaining a competitive edge. This report presents a comprehensive analysis of our recent sales data (***raw_sales_data***), aiming to uncover key trends and identify areas for improvement to generate actionable insights that will inform strategic decisions and strengthen our sales strategies.

To achieve this goal, the analysis—conducted using Excel and MySQL tools—was divided into two main parts: **data cleaning** and **exploratory data analysis (EDA)**.

🧹 Data Cleaning Process

1. Duplicate Detection

- **Assessment**: Verified that the dataset **"*raw_sales_data*"** contained no duplicate records, ensuring unique transaction integrity.

2. Handling Missing Values

- **Email & Phone**: Identified null entries in the **Email** and **Phone** columns. To maintain database consistency while preserving analysis completeness, placeholders were imputed—**not_provided@email.com** and **0**, respectively.
- **Discount (%)**: Established a new column **Discount_clean**. Missing values were replaced using the **mean discount rate** calculated over the entire period, leveraging Excel's IF(), ROUND() and AVERAGEIF() functions to create dynamic imputation. This ensures that the replacement value reflects the central tendency of available discount data—a widely accepted practice in data cleaning

3. Standardizing Data Formats

- **Order_Date**: Detected as text-type strings rather than date-type values, which could hinder chronological analyses. Utilised MySQL to convert this field into proper DATE format, using relevant conversion statements (**see *SQL queries for cleaning & aggregation.sql***). This step follows SQL best practices for ensuring data consistency and integrity.

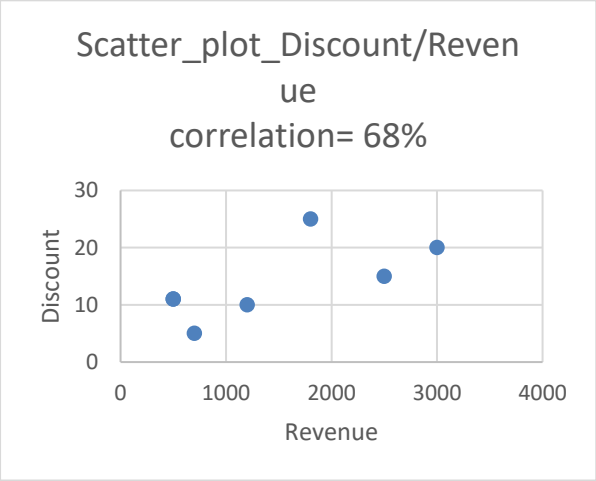
4. Documentation & Reproducibility

- A full audit of data transformation steps—including placeholder definitions, formulas applied, and SQL conversion scripts—was maintained within the Excel Query Editor and accompanying SQL scripts. This documentation enables reproducibility and transparency, key principles in quality data projects.

Summary Table of Cleaning Actions

Issue Identified	Remediation	Methodology (Tool)
Missing emails	Placeholder imputation	Excel Query Editor
Missing phone numbers	Placeholder imputation	Excel Query Editor
Missing discounts	Mean-value substitution	Excel (IF, AVERAGEIF)
Incorrect date type	Data type conversion	MySQL (STR_TO_DATE)

📊 Exploratory Data Analysis: Impact of Discounts on Sales Performance

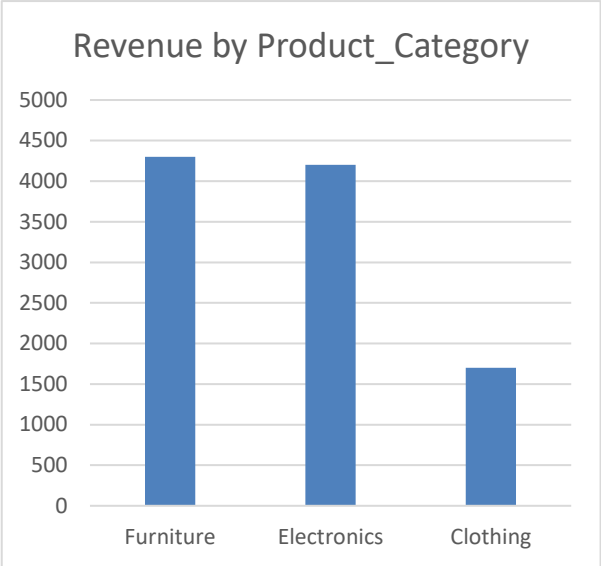


1. Correlation Between Discounts and Sales

Our analysis reveals a strong positive correlation of **68%** between discount rates and sales volumes. This indicates that as discounts increase, sales tend to rise correspondingly. Such a significant correlation suggests that discounting is a key driver of sales performance.

2. Product Category Composition

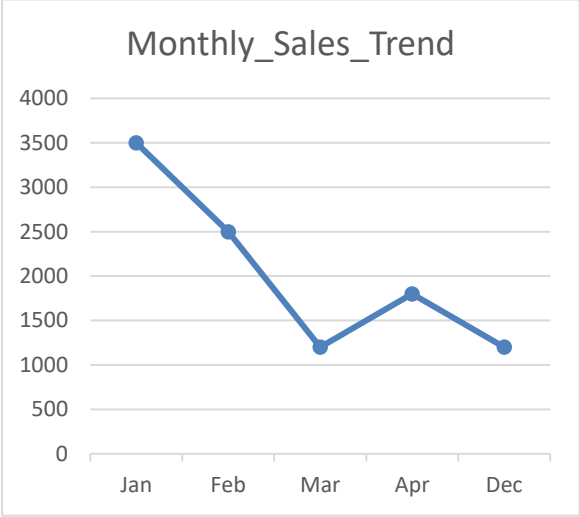
A substantial portion of sales (**83.34%**) originates from two primary categories:

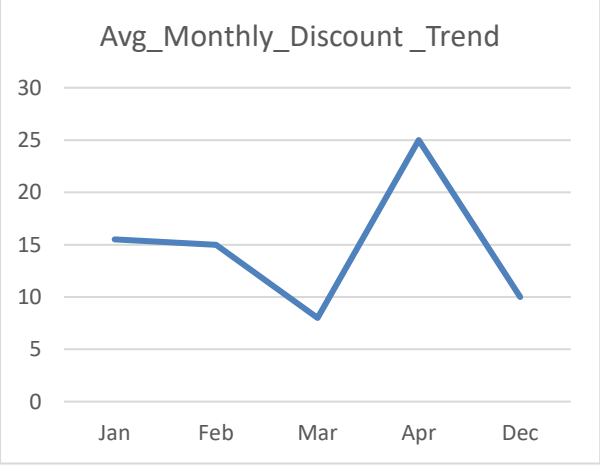


- **Furniture:** 42.16%
- **Electronics:** 41.18%

These categories typically involve high-priced items, making them more sensitive to discount strategies. Customers often delay purchases in anticipation of promotional periods, especially for such significant investments.

3. Temporal Sales and Discount Trends





An examination of monthly sales and average discount rates reveals notable patterns:

- **January to March:** Sales experienced a sharp decline of **65%**, accompanied by a **48%** reduction in average discounts.
- **March to April:** In response to declining sales, the average discount rate surged by **212.5%**, leading to a **50%** increase in sales.
- **April to December:** As the average discount rate gradually decreased by **60%**, sales correspondingly declined by **33.33%**.

These trends underscore the influence of discount strategies on sales performance, particularly in categories where consumers are price-sensitive.

💡 Strategic Recommendations

1. **Implement Targeted Discount Strategies:**
    - Focus discounts on high-margin items within the Furniture and Electronics categories to maximize profitability.
    - Utilize customer segmentation to tailor promotions, ensuring that discounts are offered to price-sensitive segments without eroding overall margins.
2. **Optimize Timing of Promotions:**
    - Schedule major discount events during periods of historically low sales (e.g., post-holiday seasons) to stimulate demand.
    - Avoid excessive discounting during peak sales periods to preserve profit margins.
3. **Monitor and Adjust Discount Depth:**
    - Employ data analytics to determine the optimal discount levels that drive sales without significantly impacting profitability.
    - Continuously assess the effectiveness of discount campaigns and adjust strategies based on real-time sales data.
4. **Enhance Customer Communication:**
    - Clearly communicate the value proposition of discounted items, emphasizing quality and savings to encourage purchases.
    - Utilize multiple channels (email, social media, in-store signage) to promote discount events effectively.
5. **Leverage Predictive Analytics:**
    - Develop predictive models to forecast the impact of various discount scenarios on sales and profitability.
    - Use these insights to inform strategic decisions regarding pricing and promotions.

By adopting these recommendations, retailers can strategically utilize discounts to drive sales while maintaining healthy profit margins. It's essential to balance promotional activities with long-term brand value and customer loyalty considerations.