**Retail Sales Analysis Report**

1. **Introduction:** The project analyses retail sales data to uncover the trends, sales stratergy , customer preferences and revenue drivers. The goal is to provide insights into sales performance across different product categories and customer demographics,helping business make data-driven decisions.
2. **Dataset Overview:** The dataset contains 9 columns where it describes-

**Transaction ID:** A unique identifier for each transaction, allowing tracking and reference.

**Date:** The date when the transaction occurred, providing insights into sales trends over time.

**Customer ID:** A unique identifier for each customer, enabling customer-centric analysis.

**Gender:** The gender of the customer (Male/Female), offering insights into gender-based purchasing patterns.

**Age:** The age of the customer, facilitating segmentation and exploration of age-related influences.

**Product Category:** The category of the purchased product (e.g., Electronics, Clothing, Beauty), helping understand product preferences.

**Quantity:** The number of units of the product purchased, contributing to insights on purchase volumes.

**Price per Unit:** The price of one unit of the product, aiding in calculations related to total spending.

**Total Amount:** The total monetary value of the transaction, showcasing the financial impact of each purchase.

**3.Data Cleaning And Preprocessing:** Before analysis , data was cleaned to ensure accuracy.

* Removed duplicates to avoid inflated sales number.
* Handled missing values by filling or removing incomplete records.
* Standardized data formats for accurate trend analysis.
* Created calculated fields such as total revenue per category.

**4.Key Insights And Visualizations:**

**Are there discernible patterns in sales across different time periods?**

* Sales increase from October to December, indicating a holiday season boost.
* The lowest sales occur in May and August, possibly due to fewer shopping events.

**Key Insight:** The fourth quarter sees a peak in sales, likely due to festive shopping during Diwali, Christmas, and New Year.

**Which product categories hold the highest appeal among customers?**

* Clothing is the top-selling category, followed by electronics and beauty products.
* The highest quantity of items sold is in clothing, indicating frequent purchases.
* Electronics generate high revenue but sell in lower quantities, suggesting higher unit prices.

**Key Insight:** Clothing drives frequent purchases, while electronics contribute more to overall revenue per transaction.

**What are the relationships between age, spending, and product preferences?**

* 18-27 years: Highest spending on clothing
* 28-37 years: Mixed spending across all categories
* 38-47 years: Highest spending on beauty products
* 48-67 years: Highest spending on electronics

**Key Insight:** Preferences shift from fashion (young) to self-care (middle-aged) to tech gadgets (older).

**How do customers adapt their shopping habits during seasonal trends?**

* Peak sales in October and December align with festival and holiday shopping.
* Higher spending per transaction during peak months compared to off-seasons.

**Key Insight:** Customers tend to shop more during festive months, likely due to holiday discounts and seasonal promotions.

**Are there distinct purchasing behaviors based on the number of items bought per transaction?**

* Customers buying 2-3 items per transaction contribute the highest sales.
* Higher item count does not always mean higher spending; bulk purchases are often lower-cost items.

**Key Insight:** Most transactions involve 2-3 items, indicating a preference for small to medium-sized shopping baskets**.**

**What insights can be gleaned from the distribution of product prices within each category?**

* Electronics have the highest price range variability.
* Clothing prices fluctuate more than beauty products, possibly due to seasonal fashion trends.

**Key Insight:** Electronics are premium-priced but purchased selectively, while clothing and beauty items have a diverse price range.

**5.Conclusion:**

* Younger customers prefer clothing, middle-aged customers buy beauty products, and older customers invest in electronics.
* Sales peak in Q4 due to festival shopping, while May-August are low-sales months.
* Clothing sells the most in quantity, while electronics generate high revenue per transaction.
* Customers typically purchase 2-3 items per transaction.
* Seasonal trends strongly influence customer spending behavior.

**6. Recommendations**

* Targeted promotions based on customer age groups.
* Seasonal discount strategies to maximize Q4 sales.
* Bundling and combo offers to encourage higher spending per transaction.
* Diverse product pricing in clothing and beauty to cater to different budget ranges**.**