

Exploratory Data Analysis (EDA) and Business Insights

1. Customer Distribution by Region

- **Graph Insights:** The distribution of customers across regions reveals where the company's primary customer base is located. This helps target marketing strategies for underserved regions.
- **Business Insight:** If most customers belong to a single region, diversifying marketing efforts in other regions can increase reach and revenue.

2. Product Distribution by Category

- **Graph Insights:** The product category distribution highlights which categories are most stocked and frequently purchased.
- **Business Insight:** Identifying underperforming product categories can help adjust inventory, and top-performing categories can be further expanded to meet demand.

3. Distribution of Product Prices

- **Graph Insights:** The histogram of product prices shows the spread of pricing and common price points.
- **Business Insight:** If a majority of products fall within a mid-range price bracket, premium pricing or budget-friendly product options could attract diverse customer segments.

4. Customer Signups by Year

- **Graph Insights:** The trend of customer signups over years shows how customer acquisition efforts have evolved.
- **Business Insight:** If signups are declining in recent years, reevaluating onboarding strategies and customer incentives is critical.

5. Total Sales by Region

- **Graph Insights:** A bar chart of sales by region pinpoints the areas generating the most revenue.
- **Business Insight:** Investing resources in high-performing regions and understanding low-performing areas can optimize revenue generation.

6. Total Sales by Product Category

- **Graph Insights:** A bar chart of sales by category identifies which product categories generate the highest revenue.
- **Business Insight:** Focused promotions and product development on top-performing categories can enhance profitability.

7. Monthly Sales Trend

- **Graph Insights:** The monthly sales trend showcases seasonality in customer purchasing patterns.
- **Business Insight:** Seasonal trends can guide inventory planning and promotional campaigns to maximize revenue during peak months.

8. Customer Spending Distribution

- **Graph Insights:** The histogram of customer spending highlights the spending behavior of most customers.
- **Business Insight:** High-value customers (top 10%) contribute significantly to sales. Implementing loyalty programs for these customers can retain them and maximize lifetime value.

Conclusion

The analysis provides insights into customer demographics, product performance, and sales trends. Strategic actions, such as targeting underserved regions, focusing on high-performing products, and nurturing high-value customers, can help optimize business growth.