**Target E-Commerce Data Analysis Report**

**Introduction**

As a Data Analyst at Target, the objective of this analysis is to extract valuable insights from the dataset and provide actionable recommendations to improve business operations and customer experience. The analysis focuses on order trends, customer distribution, economic impact, sales performance, delivery efficiency, and payment methods.

**1. Exploratory Data Analysis**

* The dataset structure was examined, and data types were assigned appropriately:
  + customer\_id and customer\_unique\_id: Text
  + customer\_zip\_code: BigInt
  + customer\_city: Character(50)
  + customer\_state: Character(2)
* The dataset covers orders placed over a specific time range, which is critical for trend analysis.
* Customer distribution across cities and states was analyzed.

**2. Order Trends and Seasonality**

* **Yearly Trends:**
  + The number of orders placed has shown a **growing trend over the years**.
* **Monthly Seasonality:**
  + A strong monthly seasonality was observed in **2017**, with peaks toward the end of the year.
  + Seasonality weakened in **2018**, especially after mid-year.
* **Order Timing Analysis:**
  + Brazilian customers mostly place their orders in the **afternoon (13:00-18:00 hrs)**.

**3. E-Commerce Growth in Brazil**

* A month-on-month order count was analyzed across different states.
* Customer distribution analysis was conducted to identify frequent and least frequent buyers by state.

**4. Economic Impact & Revenue Analysis**

* **Increase in Order Cost:**
  + From **January to August (2017-2018)**, the cost of orders (based on the payment\_value column) increased significantly.
  + Although fewer orders were placed in 2018 compared to 2017, revenue increased due to higher-value purchases.
* **State-wise Revenue Contribution:**
  + Total and average order prices were calculated for each state.
  + Identified **top contributing states** to revenue and those with the lowest contribution.
* **Freight Cost Analysis:**
  + The total and average freight values per state were analyzed to optimize the supply chain.

**5. Sales, Freight, and Delivery Time Analysis**

* **Delivery Time Analysis:**
  + The time taken to deliver each order was calculated.
  + Differences between estimated and actual delivery dates were analyzed.
* **Freight & Supply Chain Efficiency:**
  + Top **5 states with the highest and lowest average freight values** were identified.
  + This analysis helps in optimizing freight costs and improving logistics in cost-heavy states.
* **Delivery Time Optimization:**
  + The **top 5 states with the longest and shortest average delivery times** were identified.
  + Focus on minimizing delays in high-delay states.
* **Fastest Deliveries:**
  + States where orders were delivered significantly earlier than the estimated date were highlighted.

**6. Payment Analysis & Customer Preferences**

* **Preferred Payment Methods:**
  + Month-on-month analysis of orders placed using different payment types was conducted.
  + Insights from this can be used to **offer targeted discounts on preferred payment methods**.
* **Installment-Based Payments:**
  + Number of orders based on different payment installment options was analyzed.
  + This information can help in **offering flexible payment plans to boost sales**.

**7. Actionable Insights & Recommendations**

1. **Enhance Seasonal Promotions:**
   * Since sales peak towards the year-end, **implement targeted marketing campaigns and discounts** during these months.
2. **Improve Afternoon Order Processing:**
   * As most customers place orders in the afternoon, **optimize warehouse and logistics operations** for faster processing during these hours.
3. **Expand in Low-Sales States:**
   * States with lower sales should be targeted with localized promotions and advertising.
4. **Optimize Freight Costs:**
   * Focus on reducing freight costs in high-cost states to improve profitability.
5. **Enhance Delivery Time Efficiency:**
   * Work on improving logistics in states with the highest delivery times.
6. **Leverage Popular Payment Methods:**
   * Offer exclusive discounts on frequently used payment methods to drive sales.
7. **Promote Installment Plans:**
   * Providing installment-based payment options can attract more customers and boost conversions.

**Conclusion**

The analysis provides a comprehensive understanding of order trends, customer distribution, economic impact, sales, logistics, and payment behavior. Implementing the recommended strategies can help Target optimize operations, improve customer satisfaction, and drive revenue growth.