**Exploratory Data Analysis (EDA) on Instacart Data: Summary of Findings**

**Project Overview**

This project involved conducting an exploratory data analysis (EDA) on Instacart's data to uncover patterns and insights into customer shopping behaviors. The primary objective was to clean the data, identify trends, and derive actionable insights to better understand Instacart’s customer base.

**Data Cleaning and Preparation**

The first step in the project was cleaning and preparing the datasets, which included:

* **Handling Missing and Duplicated Values:** Ensured data integrity by addressing missing entries and removing duplicates.
* **Datasets Used:**
  + instacart\_orders.csv
  + products.csv
  + order\_products.csv
  + aisles.csv
  + departments.csv
* **Inconsistencies Resolved:** Standardized the data for smoother analysis, ensuring consistency across datasets.

**Findings from the EDA**

**Customer Shopping Habits**

1. **Peak Shopping Hours:**
   * Most orders were placed between **10 AM and 4 PM**, with minimal activity overnight.
2. **Reordering Frequency:**
   * Customers generally reordered every 7-11 days, with an average reorder time of approximately **11 days**.
3. **Weekly Ordering Trends:**
   * **Wednesdays and Saturdays** saw similar order volumes, with a noticeable **spike on Saturdays around noon**.
4. **Orders Per Customer:**
   * The distribution of orders per customer showed a **right-skew**, meaning a smaller subset of customers accounted for the majority of orders.
   * The average customer placed **15 orders**.

**Popular Products**

1. **Most Ordered Products:**
   * The top five products were:
     + **Bananas**
     + **Organic Bananas**
     + **Organic Strawberries**
     + **Organic Baby Spinach**
     + **Organic Hass Avocado**
   * The top 20 included a mix of fruits and vegetables, reflecting customer preferences for fresh produce.
2. **Reordering Trends:**
   * A detailed analysis of the top 20 frequently reordered items revealed that many of these were staple grocery items, indicating strong customer loyalty to specific products.

**Additional Insights**

* **Items Per Order:**
  + Analyzed the typical number of items in each order.
* **Reorder Ratios:**
  + Examined the percentage of reorders for individual products.
* **Customer Reordering Behavior:**
  + Investigated the percentage of reorders by each customer, represented through comprehensive graphs and tables.

**Conclusion**

This EDA shed light on key aspects of Instacart customer behavior, including:

* Preferred shopping times and days.
* Popular products and reordering trends.
* The average frequency and volume of customer orders.

These insights can help Instacart make data-driven strategic decisions to enhance customer satisfaction and streamline operations.