Sales by Department

Purpose: This report calculates and displays the total sales for each department.
Relevance: It helps in understanding consumer behavior by identifying which departments are most popular, aiding in inventory management and marketing strategies.

Frequent Product Combinations

Purpose: Identifies the top 10 most frequently purchased product combinations.
Relevance: Useful for understanding consumer behavior, particularly in market basket analysis, which can inform cross-selling strategies and product placement.

Customer Segmentation Analysis

Purpose: Visualizes customer segments based on their order frequency.
Relevance: Assists in enhancing customer experience by identifying different customer groups, which can be targeted with personalized marketing strategies and product recommendations.

Products Seasonality Report

Purpose: Analyzes and visualizes the seasonality of product purchases by day of the week and hour of the day.
Relevance: This report is crucial for understanding consumer purchasing patterns over different times, guiding inventory management and timing of marketing campaigns.

Reorder Frequency Analysis

Purpose: Identifies and visualizes the top 10 most frequently reordered products.
Relevance: Useful for enhancing customer experience by focusing on products with high reorder rates, which can be highlighted in personalized recommendations and inventory stocking strategies.

Aisle and Department Traffic Analysis

Purpose: Examines and visualizes the order traffic in different aisles and departments.
Relevance: This analysis is key to understanding which aisles and departments are most frequented by customers, aiding in store layout optimization and targeted marketing within specific product categories.
First-time vs Repeated Orders Analysis

Purpose: Compares the proportion of first-time orders to repeated orders among all orders.
Relevance: This analysis is crucial for understanding customer retention and loyalty, which can guide strategies in improving user experience and enhancing customer engagement.

Top Purchased Products in Each Department

Purpose: Displays the most popular products in each department, based on purchase frequency.
Relevance: This insight aids in inventory management and marketing by identifying key products in each department, which can be highlighted in promotions and tailored recommendations.

Customer Order Interval Analysis

Purpose: Examines the distribution of the average time between orders for each customer.
Relevance: This analysis provides insights into customer shopping habits, which can inform targeted marketing strategies and help in predicting future sales patterns.

Instacart Products Word Cloud

Purpose: Creates a visually engaging word cloud representing the most frequently purchased products on Instacart.
Relevance: This creative visualization highlights popular items, aiding in understanding consumer preferences and potentially guiding inventory and marketing decisions.

Demand Forecasting for Key Products

Purpose: Provides an interactive tool to forecast demand for specific products or entire departments, based on the day of the week.
Relevance: This demand forecasting is crucial for inventory management and planning marketing strategies, aligning with the objective of improving operational efficiencies and understanding consumer trends.

Product Recommendation System Using SVD Model

Objective: The goal was to create a personalized shopping experience by developing a product recommendation system.
Model Used: The Singular Value Decomposition (SVD) model, a popular algorithm for recommendation systems.
Performance Analysis:
Precision: 65.9%, indicating a good rate of relevant item recommendations.
Recall: 85.1%, showing the model's effectiveness in identifying most of the relevant items.
Accuracy: 64.8%, reflecting a balanced performance in predictions.
RMSE: 0.4670, suggesting reasonable prediction error rates.
Overall Impression: The model demonstrates a robust ability to recommend products, aligning well with the objective of enhancing customer experience through personalization. Despite some room for improvement in precision, the high recall rate is promising for effectively suggesting relevant products to users.

Interactive Product Recommendation System

Functionality: Generates personalized product recommendations for users based on their ID using an SVD model.
User Interaction: Users input their ID, and the system displays the top 5 product recommendations with preference scores.
Objective Alignment: Enhances customer experience by providing tailored product suggestions, directly supporting the project's goal of personalized shopping experiences.