

Exploratory Data Analysis (EDA) Report

Swiggy Dataset

Advanced Techniques in Data Science Course Project

Prepared by: Ameer Hamza

1. Problem Definition

Real-World Problem

The goal is to analyze Swiggy's food delivery data to understand customer behavior, delivery efficiency, and popular food trends. Efficient delivery and customer satisfaction are critical for Swiggy's success. EDA will help uncover insights to optimize operational processes and improve user experience.

Significance

- **Business Optimization:** Identify delivery time trends to enhance logistics.
- **Customer Satisfaction:** Understand correlations between delivery times and customer ratings.
- **Operational Efficiency:** Analyze most ordered items to refine inventory and resource allocation.

2. Asking the Right Questions

To guide the analysis, the following key questions were formulated:

1. What is the average delivery time across different food items?
2. Which food items are ordered the most frequently?
3. Are there specific times of day with higher delivery times?
4. How does the delivery time affect customer ratings?
5. What are the most common food pairings ordered together?

3. Data Collection

- **Source:** Kaggle Swiggy Dataset.
- **Description:** This dataset contains food delivery details, including items ordered, delivery times, and customer ratings.
- **Features:**
 - Food_Item: Name of the food item.
 - Rating_and_Delivery_Time: Combined customer rating and delivery time data.
 - Delivery_Time: Time taken for the order to be delivered (engineered feature).
 - Rating: Customer rating (engineered feature).

4. Data Wrangling (Preprocessing)

Several preprocessing steps were undertaken to ensure data usability:

- **Handling Missing Values:** Rows with missing delivery times or ratings were removed.
- **Splitting Combined Columns:** The Rating_and_Delivery_Time column was split into Rating and Delivery_Time.
- **Feature Engineering:**
 - Extracted Delivery_Time into numeric format for easier analysis.

- Created time-related features to examine trends.

5. Exploratory Data Analysis (EDA)

5.1 Delivery Time Distribution

- **Objective:** Understand how delivery times vary across orders.
- **Insight:** The majority of orders fall within a 25–50 minute range. Outliers with unusually long delivery times were identified for further investigation.

5.2 Most Ordered Foods

- **Objective:** Identify popular items based on order frequency.
- **Insight:** Biryani, Pizza, and Burgers are among the most frequently ordered items, reflecting customer preferences for fast and comfort foods.

5.3 Fastest Delivered Items

- **Objective:** Determine which items are delivered the fastest.
- **Insight:** Simple, fast-cooking items like sandwiches and salads tend to have shorter delivery times, benefiting from quicker preparation and packaging.

5.4 Food Pair Analysis

- **Objective:** Discover common food pair combinations.
- **Insight:** Popular pairs include Biryani with Raita and Pizza with Soft Drinks. This indicates customers often prefer complementary combinations.

5.5 Ratings and Delivery Time Correlation

- **Objective:** Analyze the relationship between delivery time and customer ratings.
- **Insight:** Faster deliveries generally result in higher ratings, while longer delivery times often correspond with lower ratings, emphasizing the importance of prompt service.

6. Visual Insights

The following visualizations supported the analysis:

- **Histograms:** Delivery time distribution.
- **Bar Charts:** Most frequently ordered food items.
- **Scatter Plots:** Correlation between delivery time and customer ratings.
- **Heatmaps:** Food pair combinations.

7. Conclusion

The EDA revealed significant insights into Swiggy's operations:

- **Operational Efficiency:** Understanding delivery times can guide improvements in logistics.
- **Customer Preferences:** Popular food trends help refine marketing strategies and inventory management.
- **Service Improvement:** Addressing outliers in delivery time can enhance customer satisfaction.

These insights can support Swiggy's decision-making to improve their service, leading to better customer retention and operational excellence.

