E-Commerce Transaction & Return Analysis Report

Methodology:
- Data Acquisition: Data sourced from transaction & return datasets.
- Data Preparation: Conversion of date columns to datetime format, filling missing values, and merging datasets for integrated analysis.
- Visualization: Utilized histograms, violin plots, and heatmaps to explore the relationship between product conditions, return reasons, and refund amounts.

<mark>Key Findings:</mark>

1. Product Returns & Conditions:
- Violin plots demonstrated the distribution of refund amounts across different product conditions, revealing that certain conditions consistently lead to higher refunds.
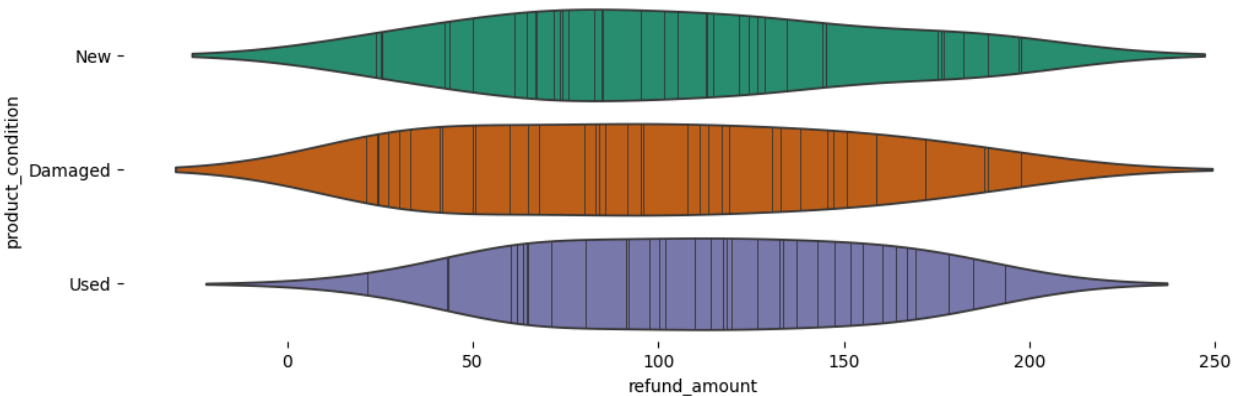
- A heatmap between return reasons & product conditions highlighted predominant trends in customer dissatisfaction, with some conditions more prone to returns than others.
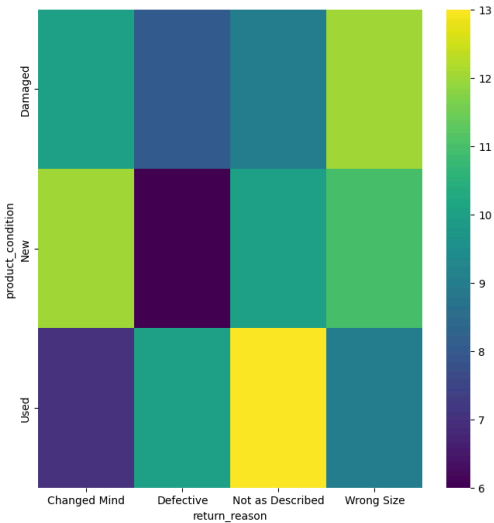
2. Financial Impact: A total refund amount analysis categorized by return reasons pinpointed the most financially impactful issues, with the total refund amount of Rs 12,254.28/-

3. Statistical Insights:
- Average Time to Return: The average time from purchase to return is 5.07 days, with a median of 5.0 days, indicating typical customer return behavior.
- High Return Rates: Identified Clothing products with high return rates, suggesting quality or expectation mismatch.
- Customer Behavior Anomalies: Detected 0 customers with abnormal return patterns.

4. Data Cleaning Insights: Addressed discrepancies by converting date columns properly and filling missing values in critical fields such as price and category, enhancing the reliability of subsequent analyses.

5. Product-Specific Analysis: Outlier products identified, categorized by high return rates, which were further analyzed to determine specific categories such as Clothing, Electronics, and Home, Books with return rates of 46.2% for specific products (product_id: 6) and 53.8% for others (product_id: 9).

Number of Returns by Product Category

Number of Returns by Product Category (2023-01-01 to 2023-06-29)

Distribution of Return Reasons
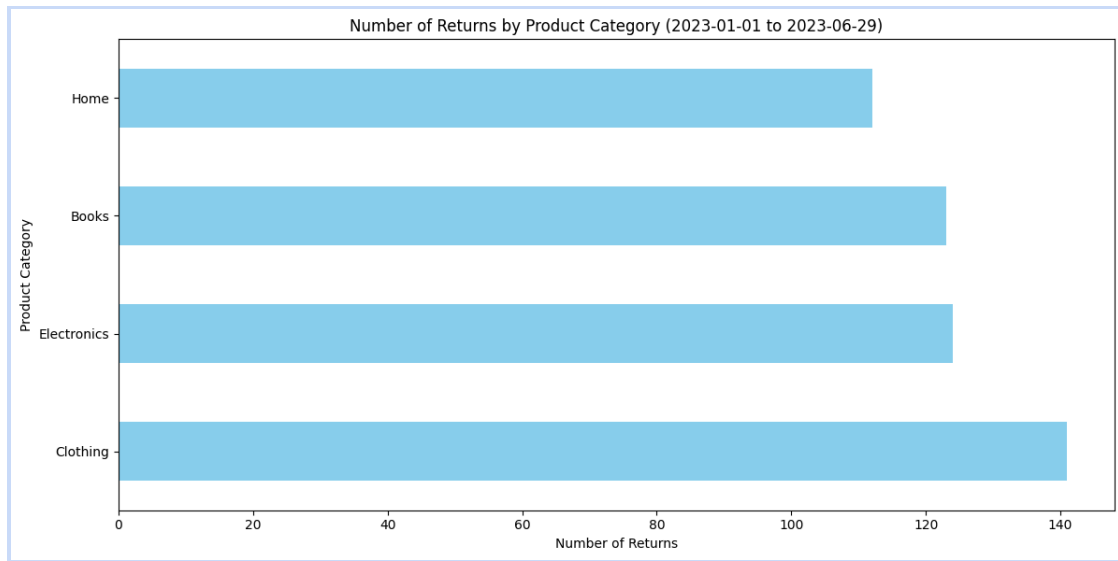
Distribution of Return Reasons
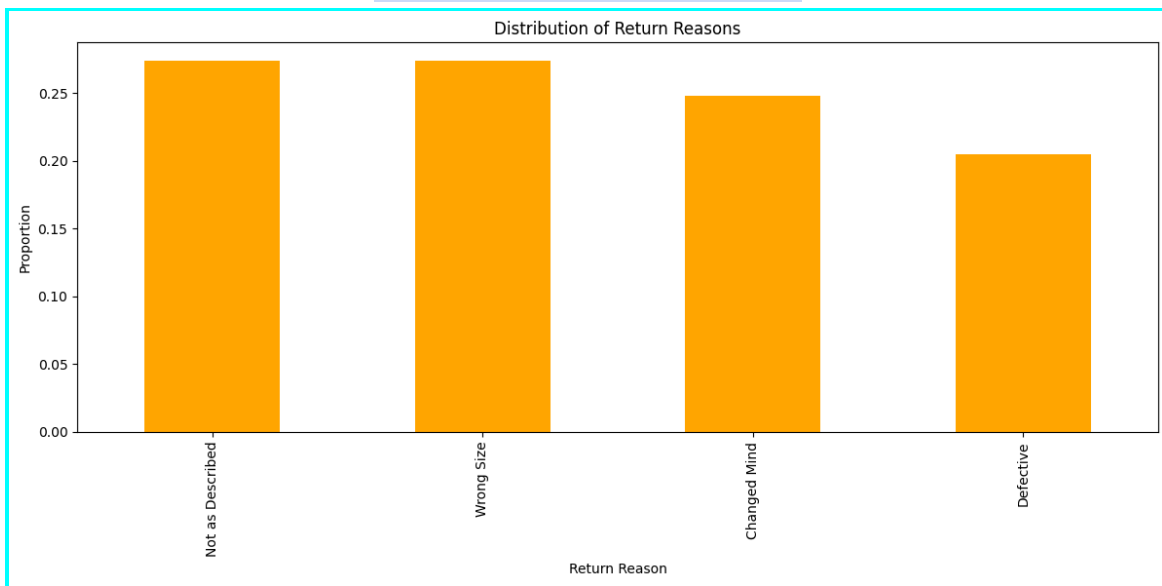
Conclusions and Recommendations:

1. Quality Control: Strengthen inspection & quality control processes for categories with high return rates to mitigate financial losses.
2. Customer Feedback: Implement more mechanisms for capturing customer feedback at the point of return to better understand the reasons behind dissatisfaction.
3. Return Policy: Review & possibly adjust the return policy to balance customer satisfaction with financial impact.