Coffee Shop Sales Analysis

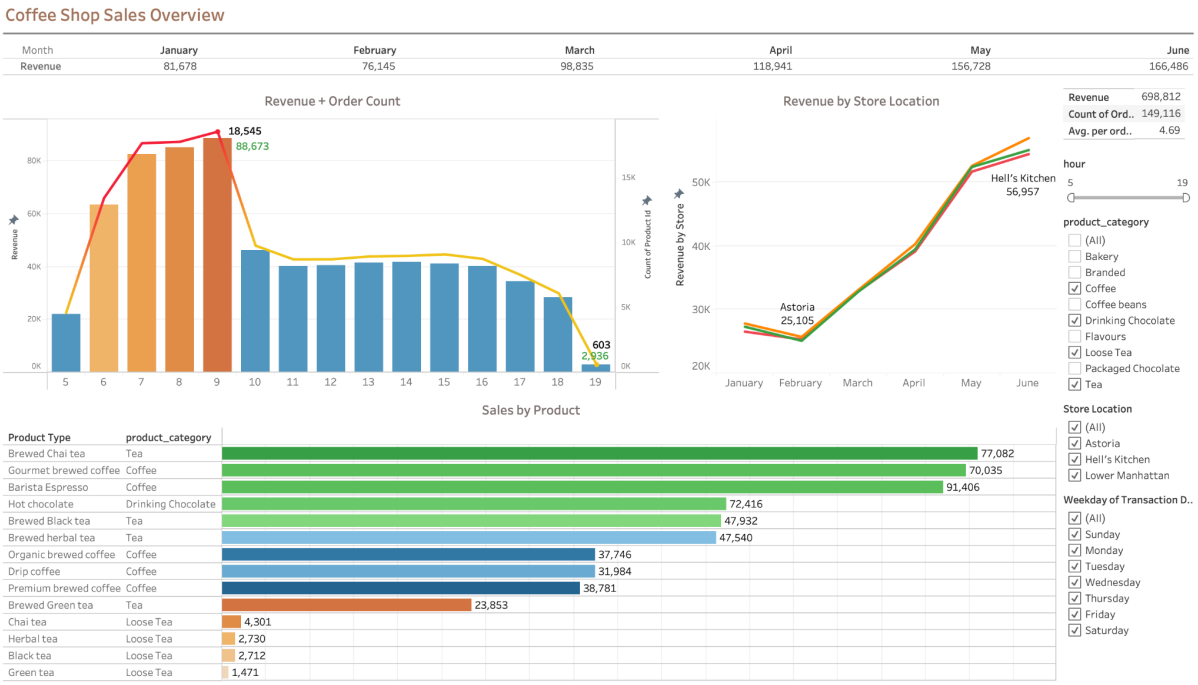
Task Statement

This analysis was inspired by my previous working experience as a barista, where I observed common patterns in customer behavior such as peak hours, order volume fluctuations. Focusing on analyzing coffee shop sales data to support operational decision-making with the goal of improving staffing efficiency, product focus, and overall operational performance.

Key Questions

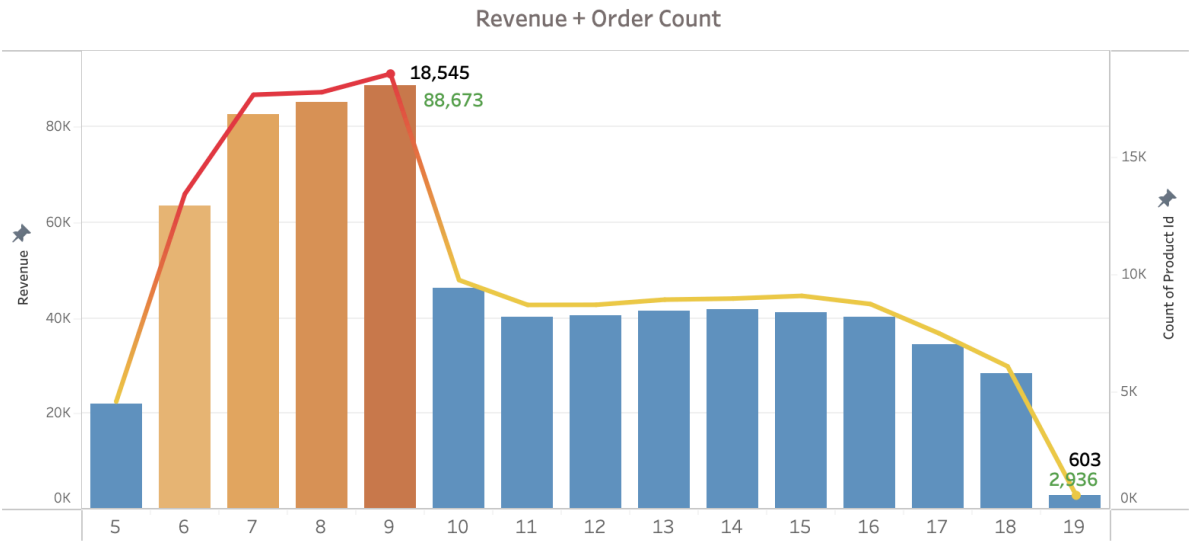
1. How can we optimize staff scheduling based on peak and off-peak traffic patterns? (Efficiency)
2. Which product categories are most popular, and how do these trends change throughout the day? (Product Performance)
3. Which is the top-performing store, and how can we adjust promotions for top-performing and low-performing locations? (Location Performance)

Dashboard Visualization (Tableau)



Key Analysis

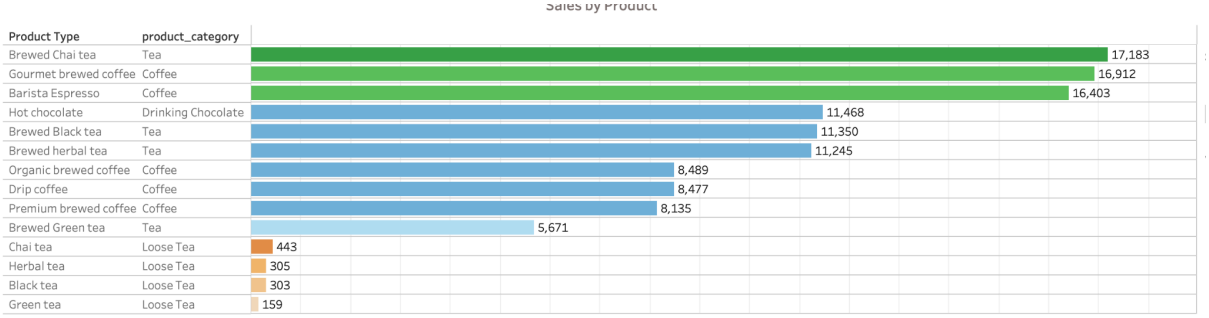
1. Labor & Shift Optimization



Key Insight:

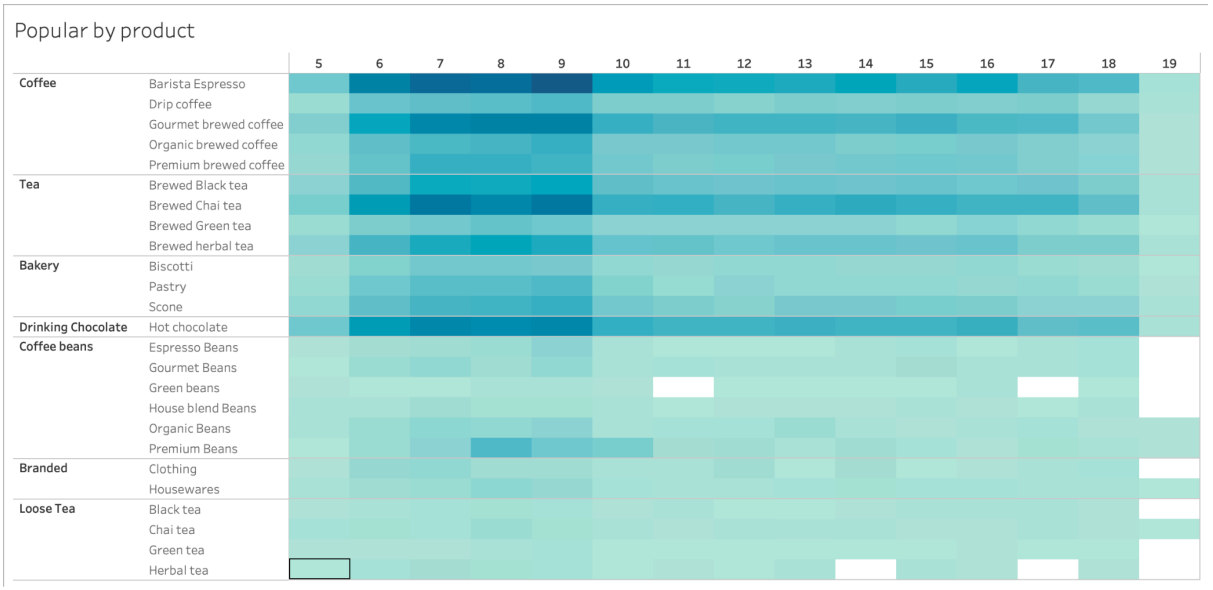
- Analysis of hourly order volume indicates that the **between 6AM to 9AM represents the primary peak period** with order volume double than the other hours. Since the customer traffic is higher, the **additional staff** is recommended during this period to meet the demand.
- From 10 AM to 4 PM, traffic remains stable. Staff can also focus on **restocking products, refilling, and performing cleaning tasks**.
- From 10 AM to 12 PM and after 4 PM, the customer traffic decreases. These periods provide the time **to arrange staff breaks**.
- After 7:00 PM, order volume drops sharply as the store approaches its 8:00 PM closing time. **Maintaining minimal staffing levels** allowing for cost-efficient operations, such as one to two staff members.

2. Product Performance



Key Insight:

- Product ranking analysis shows the top 3 products (brewed chia tea, Gourmet brewed coffee, and Barista Espresso) with double sales numbers from the most other items, while the bottom 4 products (chai tea, herbal tea, black tea, and green tea) contribute minimally to overall sales.
- Given the strong performance of selected pastry items and the relatively low sales of certain tea products, **bundled promotions** during afternoon hours may support lower-performing tea items, improving cross-category sales.
- Hot chocolate demonstrates relatively strong performance. This suggests an **opportunity to explore seasonal or flavored chocolate drinks,** particularly for winter-focused offerings.
- For low-performing products, may be evaluated through **targeted promotions or limited-time offers** to determine whether demand can be improved.



Key Insight:

- The product heatmap analysis indicates that coffee and brewed tea show a strong demand during morning hours (6–9 AM), particularly barista espresso, Gourmet brewed coffee, brewed chai tea, and hot chocolate demonstrate more stable demand during the day.
- Among the bakery products, **scone has higher demand** than other products, and may **consider having more flavor scone** for more sales.
- Coffee beans and branded products show no distinct peak hours. This indicates that these items are primarily **non-immediate consumption products** and are less influenced by peak service periods. The promotional efforts for coffee beans and branded items may not need to align with peak operational hours.

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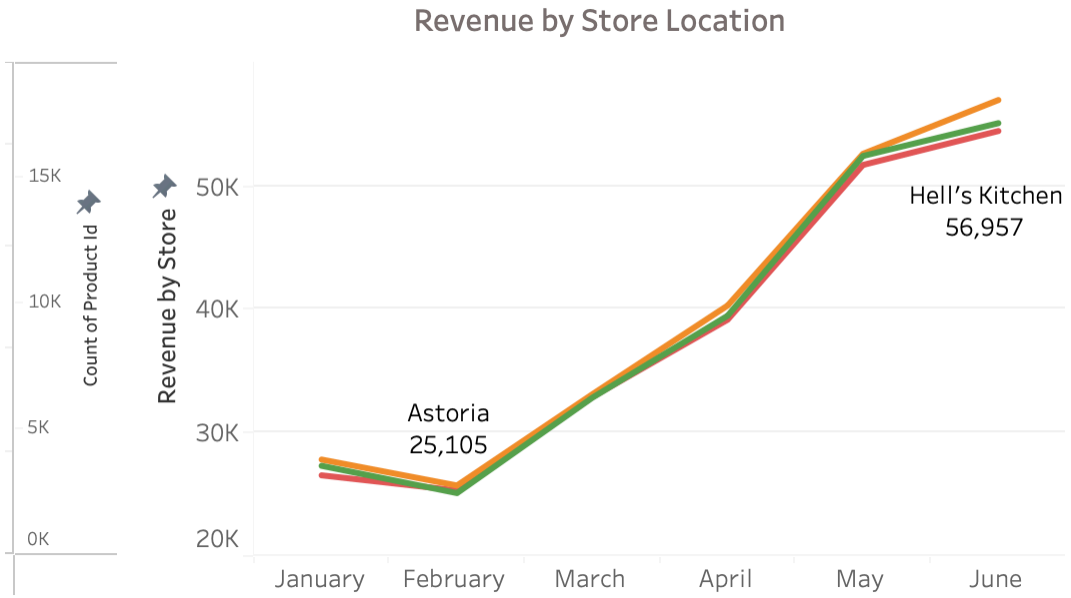
3. Location Performance



Key Insight:

- The Store performance chart indicates that Hell's Kiychen has slightly higher revenue compared to the other two locations, although the overall performance gap is relatively small.
- Revenue trends across the three locations **move in a highly similar pattern** with peaks and declines occurring simultaneously. This suggests that **location is not the primary driver of revenue differences.** Seasonality or overall demand trends may have a stronger influence.
- Sales appear relatively **lower at the beginning of the year**, reaching a low point in February. This pattern suggests a possible seasonal effect. **Additional marketing** efforts such as early-year promotions, email campaigns or increased social media content may be considered during January to March to bring more customer traffic.
- Since location is not the primary factor to affect revenue, we may consider **developing time-based or product-based strategies** rather than location-based ones**.**

Skills Demonstrated in This Project

This project demonstrates an end-to-end data analysis workflow, from problem definition to insight generation.

- Problem definition and analytical thinking through defined business questions.
- Data cleaning and transformation using SQL.
- Data visualization and dashboard design using Tableau.
- Business insight development and analytical storytelling through structured reporting.

Data Information

Data Category

- Transaction Information (Date, Time, Quantity)
- Order details (Type, Category)
- Store information (Location, Store id)

Key Analysis

- Labor & Shift Optimization
    - order by hour / revenue by hour
- Category Trends
    - Count by product_type by hour
- Location Performance
    - Sum revenue by location

Key Data Cleaning (SQL)

- Transaction time was cleaned by extracting the hour value to support hourly grouping.
- Revenue was calculated at the transaction level and aggregated for analysis.

Data Sources

Mavon Coffee Shop Sales

Tools

Data Cleaning	SQL, MS Excel
Data Visualization	Tableau