**Coffee Shop Sales Analysis:**

**Understanding Customer Behaviour for Strategic Growth**

**Abstract**

This research paper analyses coffee shop sales data to identify customer purchasing patterns. The analysis explores variations in sales based on factors such as time of day, day of the week, location, season, and product category. Key findings reveal a morning peak in sales, dominance of coffee purchases within categories, and location-specific preferences in size and product choices. The insights gained from this analysis can be leveraged by the coffee shop to optimize operations, product offerings, and marketing strategies for improved customer satisfaction and business growth.

**Keywords**

Coffee shop sales, customer behaviour, sales trends, product popularity, location analysis, seasonal variations

**1. Introduction**

Coffee shops have become a ubiquitous presence in modern society, serving as social hubs and fuelling productivity. Understanding customer purchasing patterns is crucial for coffee shops to thrive in a competitive market. This research paper delves into sales data to extract insights into customer behaviour across various dimensions.

**2. Literature Review**

Existing research supports the findings presented in this analysis**.** Studies have shown a consistent morning peak in coffee purchases, aligning with the observed 10AM peak in this study. Additionally, location has been identified as a factor influencing coffee shop sales.

**3. Methodology**

Sales data from maven analytics website covering the half of 2023, was utilized for this analysis. The dataset comprised information on sales transactions, including date, time, location, purchased items, and total amount. Data visualization tools and descriptive statistics were employed to analyse the data and identify trends.

**4. Results**

**4.1 Day and Hour Variations:**

* Sales exhibited a clear peak at 10AM, confirming a robust "morning coffee" culture. This suggests staffing strategies should prioritize adequate personnel during this timeframe to ensure efficient service and minimize customer wait times. Additionally, marketing efforts could target early risers and working professionals who rely on their morning cup of coffee.
* Mondays and Fridays displayed the highest overall number of orders, potentially signifying post-work or weekend treat purchases. Targeted promotions or extended hours on these days could capitalize on this increased customer demand.

**4.2 Product Category Variations:**

* Coffee emerged as the dominant category in terms of sales, with Branded Coffee, Bakery Items, and Flavoured Coffee exhibiting the lowest sales figures. This finding suggests a focus on core coffee offerings while carefully evaluating the demand for other categories. Experimenting with new flavors or introducing limited time offers for bakery items could be strategies to gauge customer interest and potentially expand the product portfolio.
* Regular-sized coffee was the most popular choice, while Small was the least preferred size. Optimizing inventory management to ensure sufficient stock of regular-sized cups is crucial. Investigating the reasons behind the low demand for small sizes could inform potential adjustments or eliminations from the menu.

**4.3 Location-Based Analysis:**

* **Astoria:**
  + Large and Regular coffees were the most in demand. Ensuring adequate stock of larger cups is essential for this location.
  + Barista Espresso was the top-selling product. Highlighting this product through in-store promotions or combo deals could further boost sales.
  + Thursdays witnessed the highest order volume. Introducing targeted promotions or special events on Thursdays could capitalize on this peak in customer traffic.
* **Hell's Kitchen:**
  + Size information was absent in a significant portion of orders. Implementing a system to capture size data consistently would provide valuable insights for optimizing inventory management.
  + Barista Espresso was the best-selling product. Similar to Astoria, promoting Barista Espresso could be a successful strategy.
  + Fridays saw the highest number of orders. Tailoring marketing efforts or promotions towards the end of the week could leverage the increased customer base in Hell's Kitchen on Fridays.
* **Lower Manhattan:**
  + Size information was missing in a considerable number of orders. As with Hell's Kitchen, a system to capture size data is necessary for informed inventory management decisions.
  + Barista Espresso was the best-selling product. Promoting Barista Espresso would likely be effective in Lower Manhattan as well.
  + Thursdays had the highest number of orders. Similar to Astoria, Thursdays present an opportunity for targeted promotions or events to maximize customer engagement.

**4.4 Week-Based Analysis:**

* Mondays witnessed the highest sales in Lower Manhattan, whereas Astoria had the highest foot traffic. Lower Manhattan's higher sales on Mondays suggest a strong preference for grabbing coffee at the start of the work week. Astoria's high foot traffic on Mondays indicates it attracts a larger customer base overall. The coffee shop can leverage these insights to tailor staffing and marketing strategies for each location on Mondays.
* Tuesdays, Fridays, and Saturdays saw the highest sales and foot traffic in Hell's Kitchen. This suggests Hell's Kitchen experiences a consistent customer flow throughout the week, potentially due to its central location or a strong presence of weekend customers. Maintaining consistent staffing levels and offering enticing promotions throughout the week could maximize sales in Hell's Kitchen.
* Wednesdays and Thursdays observed the highest sales and foot traffic in Astoria. This indicates a mid-week peak in customer activity for Astoria. Introducing special offers or events on Wednesdays and Thursdays could capitalize on this trend and further boost sales in Astoria.

**4.5 Customer Bill Analysis:**

* **Average Bill per Person:** $4.69
* **Average Order per Person:** 1.44
* **Total Footfall:** 149,116
* **Total Bill:** $698,812.33

The analysis of customer bills revealed an average bill of $4.69 per person and an average order of 1.44 items per person. This suggests that customers typically purchase more than one item per visit. The total footfall of 149,116 and total bill of $698,812.33 provide a basis for calculating customer conversion rate (percentage of visitors who make a purchase) for future comparisons.

**Key Insights from Customer Bill Analysis:**

* The difference between the average bill ($4.69) and average order (1.44) indicates customers might purchase for themselves and others or buy drinks and food together.
* Analysing the total footfall and total sales across different locations or timeframes can reveal opportunities to improve sales in high foot traffic areas.

**Recommendations based on Customer Bill Analysis:**

* Develop upselling strategies or combo offers to encourage customers to spend more per visit (considering the average bill is $4.69).
* Analyse the relationship between total footfall and total sales to identify areas for improvement in sales conversion.

**4.6 Seasonal Variations:**

* **Winter (January-February):** Displayed the highest order volume on Mondays. This potentially reflects a desire for a warm beverage to combat the cold weather. Promotional campaigns featuring warm coffee drinks or winter-themed beverages could be implemented during winter months.
* **Spring (March-June):** Witnessed the highest orders on Wednesdays. The reason behind this mid-week peak is unclear and might warrant further investigation. However, the coffee shop could experiment with Wednesday-specific promotions to potentially establish a stronger customer base on this day during spring.
* **Summer (July-August):** Foot traffic analysis is recommended due to the potential for increased leisure activities during this season. Introducing seasonal beverages or lighter fare options could capitalize on the summer customer base.
* **Autumn (September-December):** Analyse customer behaviour patterns to identify potential trends and tailor marketing strategies accordingly.

**5. Data Cleaning and Analysis Considerations**

Our data cleaning process involved addressing inconsistencies and ensuring data accuracy. This included handling missing values and formatting date/time entries. These steps are crucial for ensuring the reliability of the analysis. However, some limitations are worth noting. For instance, the missing size data in Hell's Kitchen and Lower Manhattan limits our ability to draw definitive conclusions about size preferences in those locations. Implementing a system to capture size data consistently across all locations would be beneficial for future analysis.

**6. Discussion**

The findings reinforce existing research on coffee consumption trends and provide valuable insights into customer behaviour specific to this coffee shop chain. The consistent morning peak and dominance of coffee purchases align with industry trends. However, the analysis also revealed location-specific variations in size preferences and product popularity, highlighting the importance of tailoring strategies to individual outlets.

For example, Astoria's mid-week peak suggests the potential for introducing "hump day" promotions to attract customers on Wednesdays and Thursdays. Additionally, promoting Barista Espresso, the top-selling product across all locations, could be a successful strategy chain-wide.

**7. Conclusion**

This analysis of coffee shop sales data provided valuable insights into customer behaviour. The "morning coffee" culture, dominance of coffee purchases, and location-specific preferences offer a foundation for optimizing operations, product offerings, and marketing strategies. By leveraging these findings, the coffee shop can enhance customer satisfaction, increase sales, and achieve sustainable growth.

**8. Recommendations**

* Implement targeted staffing strategies to ensure efficient service during peak hours (10AM).
* Develop marketing campaigns focused on early risers and working professionals.
* Evaluate the demand for Branded Coffee, Bakery Items, and Flavored Coffee to optimize product offerings.
* Consider offering combo deals or promotions featuring Barista Espresso.
* Implement a system to capture size data consistently across all locations.
* Design location-specific marketing strategies based on customer preferences and foot traffic patterns.
* Introduce seasonal beverages or lighter fare options during summer months.
* Experiment with Wednesday-specific promotions in Astoria to potentially establish.

**9. Reference**

* Data Sample from Maven Analytics

https://mavenanalytics.io/data-playground?page=4&pageSize=5