

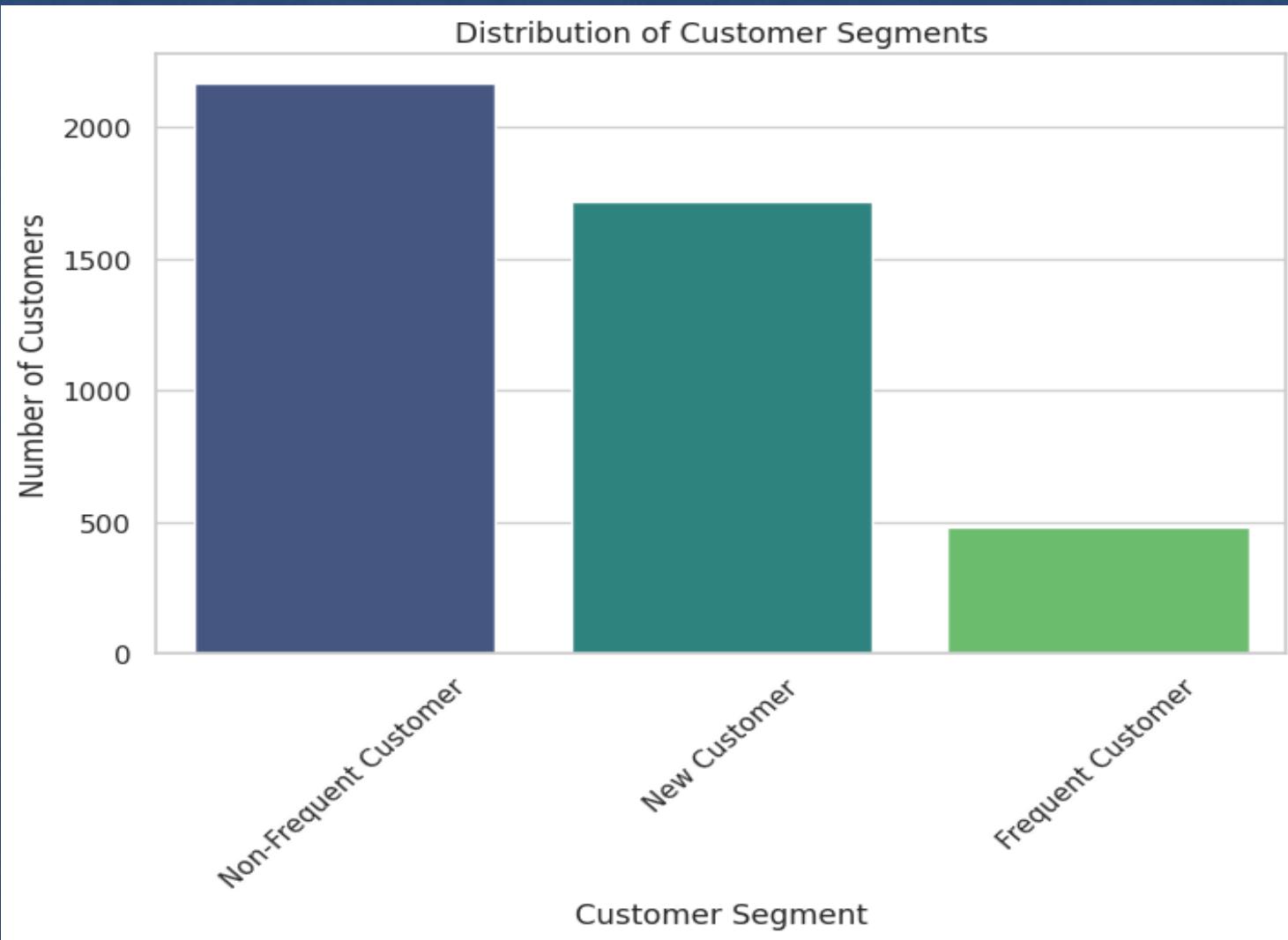
E-Commerce: Identify Consumer Profiles

09/10/2024 – 24/10/2024

General Conclusion

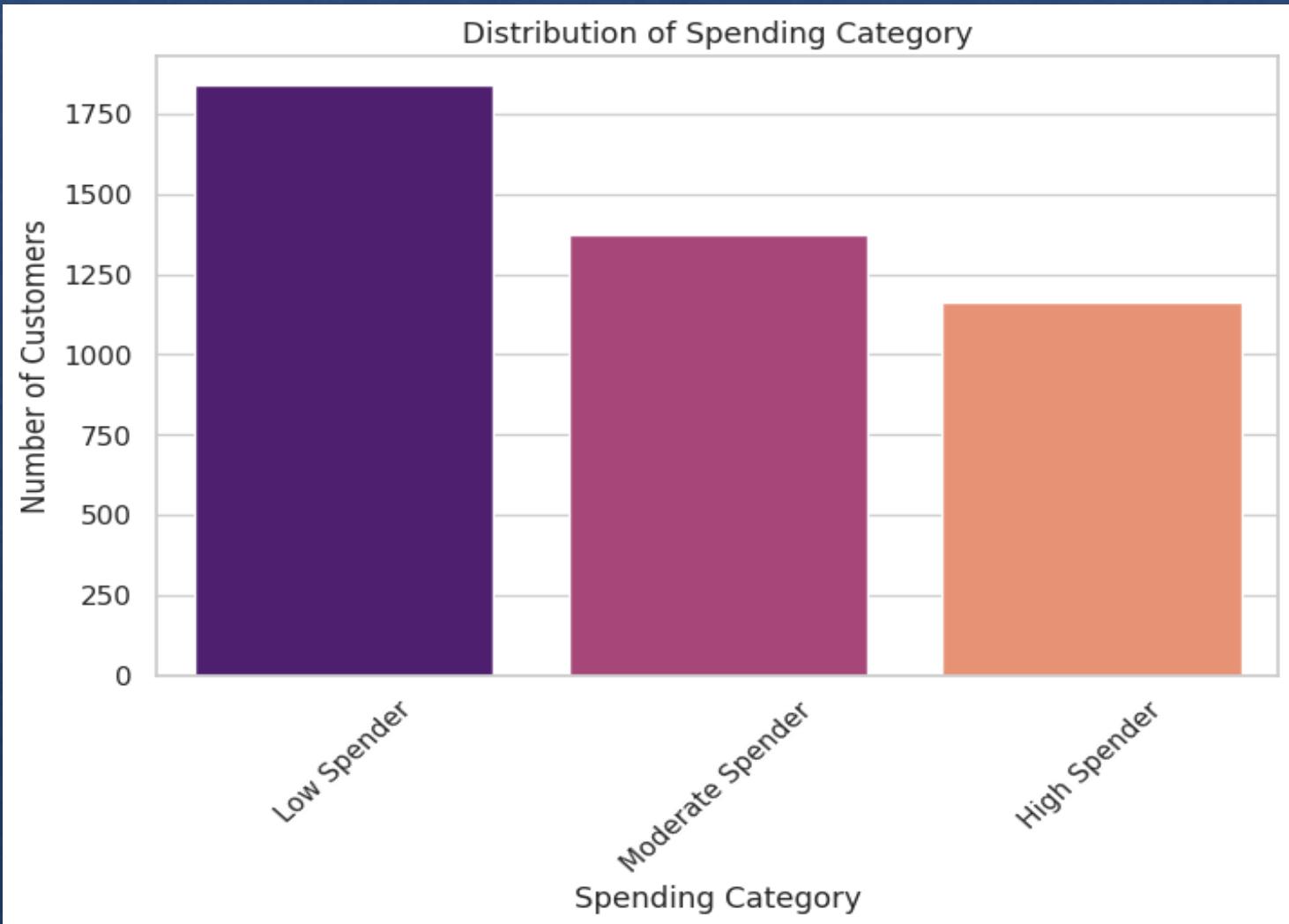
- The Non-Frequent Customer segment (~2,000) is the largest, presenting an opportunity to drive repeat purchases. New Customers (~1,500) show strong acquisition, but retention strategies are needed. Frequent Customers (<500) highlight room for improved loyalty programs.
- For **spending behavior**, **Low Spenders** (~1,750) may be price-sensitive, while **Moderate Spenders** (~1,250) offer up-sell potential. **High Spenders** (~1,000) represent a niche for premium products. Aligning marketing efforts with these spending patterns can enhance outcomes.
- In the **second half of the year**, higher quantities were purchased, but the **average spend per purchase** was slightly higher in the first half. No significant difference was found in individual spending across periods, suggesting stable purchasing behavior.

Distribution of Customer Segments



- The Non-Frequent Customer segment has the highest number of customers, exceeding 2,000 individuals. This suggests that a large proportion of the customer base does not frequently engage with the business, which could indicate a need for targeted marketing strategies to convert them into more regular customers.
- The New Customer segment accounts for a substantial number of customers, likely around 1,500. This indicates that the business is successfully attracting new customers, which is a positive sign for growth.
- The Frequent Customer segment has the lowest number of customers, with fewer than 500 individuals. This may highlight a significant opportunity for improvement in customer loyalty programs, as these customers represent a valuable asset for repeat business.

Distribution of Spending Category



- The Low Spender category has the highest number of customers, with approximately 1,750 individuals. This indicates that a significant portion of the customer base spends less, which could imply price sensitivity or a preference for budget-friendly options.
- The Moderate Spender category has around 1,250 customers. This group is smaller than the low spenders but still constitutes a substantial part of the customer base, suggesting a middle-ground approach to spending.
- The High Spender category has the least number of customers, approximately 1,000. This indicates that fewer customers fall into this category, which could suggest that high-value items or luxury products appeal to a niche market.

Hypothesis Testing

The analysis focuses on three key hypotheses:

- First, **non-frequent customers** are expected to spend more than frequent customers, possibly indicating that occasional buyers make larger one-time purchases.
- Second, customers with a **higher number of invoices** are predicted to be high spenders, suggesting that frequent transactions correlate with greater overall spending.
- Lastly, the analysis will test whether the **quantity of purchases** made in the **first half of the year** is smaller than those made in the **second half**, indicating potential seasonal variations in buying behavior.

Non-frequent customers spend more than frequent customers

Null Hypothesis (H_0): Average spending between frequent and non-frequent customers are identical.

Alternative Hypothesis (H_1): Non-frequent customers spend more than frequent customers.

Test: Independent t-test (since we are comparing the means of two independent groups).

Results

- Mean total revenue from Frequent Customers: 1105.3607644628094
- Mean total revenue from Non-Frequent Customers: 3255.7848857142853
- Variance for Frequent Customers: 8047165.123954415
- Variance for Non-Frequent Customers: 129988792.7143338
- T-statistic: -7.7733993503399175, p-value: 1.0876372982374861e-14

The results indicate that non-frequent customers generate more revenue on average than frequent customers. While frequent customers make more purchases, their total spending is lower. On the other hand, non-frequent customers buy less often, but when they do, their purchases are substantially higher.

Customers with more invoices tend to be high spenders.

Null Hypothesis (H_0): There is no association between the number of invoices and the spending category.

Alternative Hypothesis (H_1): Customers with more invoices are more likely to be high spenders.

Test: Chi-squared test (since we are testing the relationship between two categorical variables)

Contingency Table:

spending_category/invoice_category	High Spender	Low Spender	Moderate Spender
High	446	0	13
Low	118	1746	756
Moderate	598	90	605

Chi-squared Statistic: 2700.816557871254, p-value: 0.0

The analysis shows that there is a strong relationship between the number of invoices and spending behavior.

High invoice count is strongly associated with high spending. Low invoice count is mostly associated with low spending.

First-Half year quantity purchases are smaller than Second-Half year

Null Hypothesis (H_0): There is no difference in the average quantity of purchases between the first half and the second half of the year

Alternative Hypothesis (H_1): The average quantity purchased in the first half of the year is smaller than the second half of the year

Test: Independent t-test (since we are comparing the means of two independent groups)

Results

- Mean total quantity for First Half of the year: 12.318864136150683
- Mean total quantity for Second Half of the year: 12.104395302897279
- Variance for total quantity for First Half of the year: 78237.9393835307
- Variance for total quantity for Second Half of the year: 53700.71054316777
- T-statistic: 0.24851094060152748, p-value: 0.8037393015050123

The analysis shows that there is no meaningful difference in the average quantity of purchases between the first and second halves of the year. Although the variance is higher in the first half, suggesting more variability in purchases, this difference in spread does not result in a significant difference in means.

Recommendations

1. Encourage Repeat Purchases: Implement discounts and loyalty programs to convert non-frequent customers into regular buyers, and motivate frequent customers to increase their purchase amounts.
2. Retain New Customers: Use onboarding campaigns, first-purchase rewards, and exclusive offers to build strong relationships with new customers, encouraging them to become frequent buyers.
3. Enhance Loyalty for Frequent Customers: Develop tailored incentives, VIP programs, and early access to new products to engage and retain this valuable segment.
4. Targeted Marketing Strategies:
 - Low Spenders: Promote budget-friendly deals.
 - Moderate Spenders: Offer upsell opportunities for mid-tier products.
 - High Spenders: Provide premium experiences and exclusive recommendations.
5. Analyze Invoice Trends: Regularly assess spending patterns to adjust marketing strategies and promotions effectively.
6. Focus on Seasonal Campaigns: Invest more in marketing during the second half of the year while implementing special promotions in the first half to balance purchasing behavior.

Tableau Public Link

https://public.tableau.com/views/FinalProject-DailyPurchaseOverview/Dashboard1?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

