Market Analysis Report

Introduction:

This report will provide a brief overview of the questions, findings, and recommendations based on the analysis performed. The aim of this analysis was to optimize product recommendations to customers and improve targeted marketing.

Questions:

The following are the primary questions that have been attempted to be answered during this analysis. All findings and visualizations can be directly referenced within the attached Power BI file. At the end of each question, I will reference the specific page within the Power BI file where answers can be found.

1. What is the correlation (R^2 value) between sales and income?
   - R^2 = 0.78, which indicates a relatively strong correlation between average sales per state and average income per state. (reference: Income vs. Sales Analysis)
2. What is the correlation (R^2 value) between customer ratings and product return rate?
   - R^2 = 0.69, the correlation between customer ratings and return rates also seems strong. However, it is worth noting that there were not a significant amount of data points to have full confidence in the strength of this correlation. (reference: Ratings vs. Returns Analysis)
3. What are the linear regression formulas to predict customer sales and customer incomes? (reference: Income vs. Sales Analysis)
   - Customer Income: $y = 72.43x + 72,638.21$
   - Customer Sales: $x = \dfrac{72,638.21 - y}{-72.43}$
4. Which customer do you predict has the highest income?
   - Based on the regression analysis, Jon Little was predicted to have the highest income of $452,895.71. (reference: Income Analysis)
5. Which product will be advertised the most?
   - In terms of income category, either pleated skirts, light sweatshirts, or wool scarves will be advertised the most. This is because the income category, 80-100k, has the largest customer base of 443 total customers. The reason there are three products recommended in this income category is because they are similar enough in price, in some cases the same price,

that it did not constitute separating these products into different income categories. The same is true for the income categories: 60-80k, 100-120k, and 160-180k. (reference: Income Analysis)

- ○ In terms of customer ratings, it may be beneficial to focus advertising on the product(s) that have the highest customer ratings. If customers already rate a product highly, leveraging additional advertising could very well significantly improve overall sales. (reference: Ratings vs. Returns Analysis)

Additional Findings:

In addition to the above analysis, a sales trend analysis and customer base analysis was also performed. Below are the key findings that will have a direct impact on marketing and sales.

- Sales Trend Analysis: for this analysis, a line chart was constructed which measured the total sales per day across the entire time frame of the dataset. Next to the chart, a card displays the top 5 days for total purchases. These dates tend to cluster around the winter holidays, between September and December. However, there is a noticeable lull of purchasing between January and March. From a marketing standpoint, this may be a good time to advertise exclusive promotions to customers who need to be more motivated to shop.
- Customer Base Analysis: for this analysis, a geospatial visualization was constructed that showed which states have the largest customer bases with respect to their population, per 100,000 residents. From this analysis, it was found that Wyoming has the largest customer base, with 1.9 customers per 100,000 residents, and Ohio has the smallest customer base, with 0.09 customers per 100,000 residents. This may suggest that marketing budgets should be more focused on states like Wyoming, where the probability of acquiring a customer is highest. Other states with large customer bases include: Vermont, D.C., Alaska, and North Dakota.

External Data Sources:

1. State Population Data - https://www.census.gov/data/tables/time-series/demo/popest/2010s-state-total.html

Recommendations:

The following recommendations will summarize how to use the results from this analysis effectively.

- The correlation between sales and income is strong, therefore focus on customs with higher incomes when possible. The same can be said for the correlation between ratings and returns. Focus on advertising and promoting products with higher ratings, such as the Chronograph Watch.

- Although there is a strong correlation between higher incomes and higher sales, marketing exclusively to higher income customers would be a mistake, since we found that a majority of customers have an income between $80,000 and $100,000.

- In addition, creating new and creative marketing campaigns between January and March may be beneficial, due to low sales in this period.

- Lastly, launch new targeted marketing campaigns in states where your customer base is most concentrated with respect to population, such as Wyoming, Vermont, and D.C.