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Marketing Campaign Data

17 July 2023

Marketing Campaign Data Analysis Report

1. Introduction

This report presents findings from the analysis of the "Marketing Campaign Data" dataset, uploaded by Rodolfo Saldanha on Kaggle.com. The dataset includes comprehensive marketing campaign information, capturing customer demographics, product preferences, campaign responses, and revenue generated. The analysis aims to understand the effectiveness of these marketing campaigns, providing valuable insights for strategists, data analysts, and marketing enthusiasts.

2. Data Analysis

The analysis used Python, including the NumPy, Pandas, Matplotlib, Seaborn libraries. The Jupyter Notebook code was used for the analysis, which explored and understood the dataset. The key findings are as follows:

2.1 Data Shape and Columns

The dataset consists of 2,240 rows and 30 columns. The columns are: 'ID', 'Year_Birth', 'Education', 'Marital_Status', 'Income', 'Kidhome', 'Teenhome', 'Dt_Customer', 'Recency', 'MntWines', 'MntFruits', 'MntMeatProducts', 'MntFishProducts', 'MntSweetProducts', 'MntGoldProds', 'NumDealsPurchases', 'NumWebPurchases', 'NumCatalogPurchases', 'NumStorePurchases', 'NumWebVisitsMonth', 'AcceptedCmp3', 'AcceptedCmp4', 'AcceptedCmp5', 'AcceptedCmp1', 'AcceptedCmp2', 'Complain', 'Z_CostContact', 'Z_Revenue', 'Response'.

2.2 Data Types and Cleaning

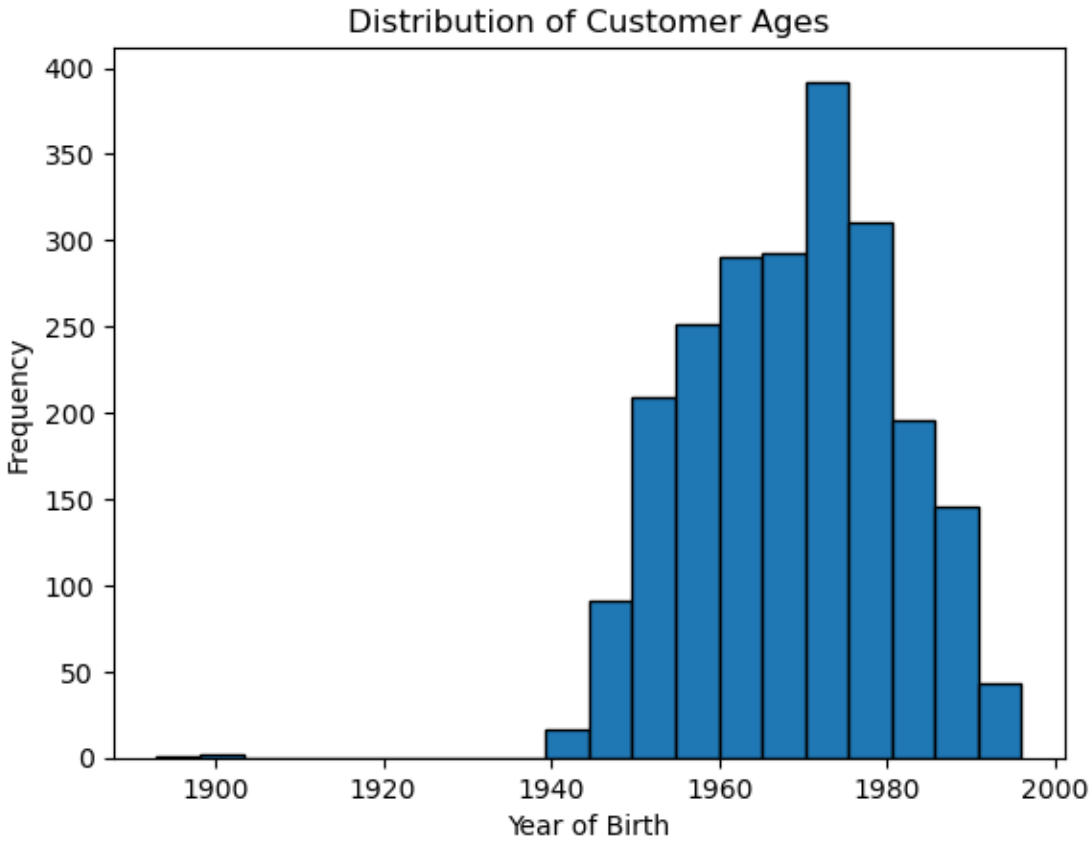
The data types of the columns were checked and aligned with their respective attributes. The “Dt_Customer” column was converted to Datetime Type. Additional columns were created for Date, Month, and Year extracted from the "Dt_Customer" column. A Revenue column was also created to represent the total amount spent across multiple categories: 'MntWines', 'MntFruits', 'MntMeatProducts', 'MntFishProducts', 'MntSweetProducts', and 'MntGoldProds'.

Imputed missing values in Income column with average values based on Education.

3. Findings

3.1 Campaigns Analysis:

- **4th Campaign** was the most successful and was accepted by 167, more than 3rd and 5th's 163 each.
- **Wines** was the most popular item customers accepted campaigns for. Campaign 1 got 3 customers, Campaign 2 brought 4 customers, Campaign 3 had 2, Campaign 4 did 6, and Campaign 5 brought in 9 customers, all for wines.
- Most complaints were 1, with the highest revenue customer spending $1,365.
- Most customers have a birth year in the range of 1970-75.



3.2 Revenue Analysis

The analysis revealed the relationship between revenue and factors such as category, gender, and payment methods. Clothing, Shoes, and technology generated the most revenue, with males contributing more revenue in those categories than females. Higher quantity indicated higher revenue.

- Customers who enrolled in **Feb. 2014** provided the highest revenue followed by July, October, and February of 2013.
- Customers born in 1991 provided the highest revenue, ahead of 1988.
- $85,000-$90,000 income range provide the most revenue with the highest income at $90,638.
- Top revenue providers did not have a kid or teen at home.

- Top spending customers made their last purchase 29 days ago. Customers who did not make their last purchase in the last 99 days posted lower revenue.
- Average Recency by Quartiles based on Revenue: 49, 48.65, 48.78, and 49.95.
- Sum of responses: 334
- Most customers are Graduates, then PhDs and Masters.

3.3 Monthly Trends

45,551 invoices were recorded in 2022, a slight increase from 45,382 in 2021. The first quarter of the year is the highest selling period, with the highest selling months being January, February, and March. The first week of the months are the best-selling days with Monday, Friday, and Tuesday leading the list.

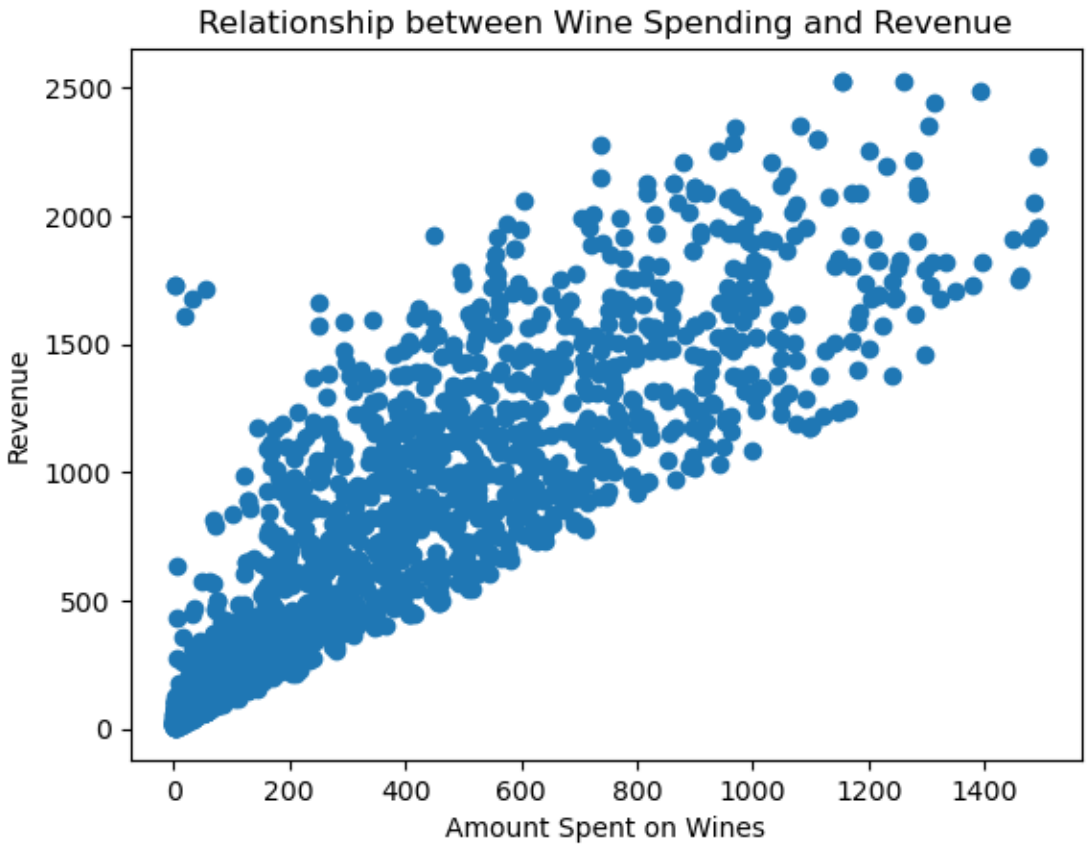
3.4 Amount Spent Patterns

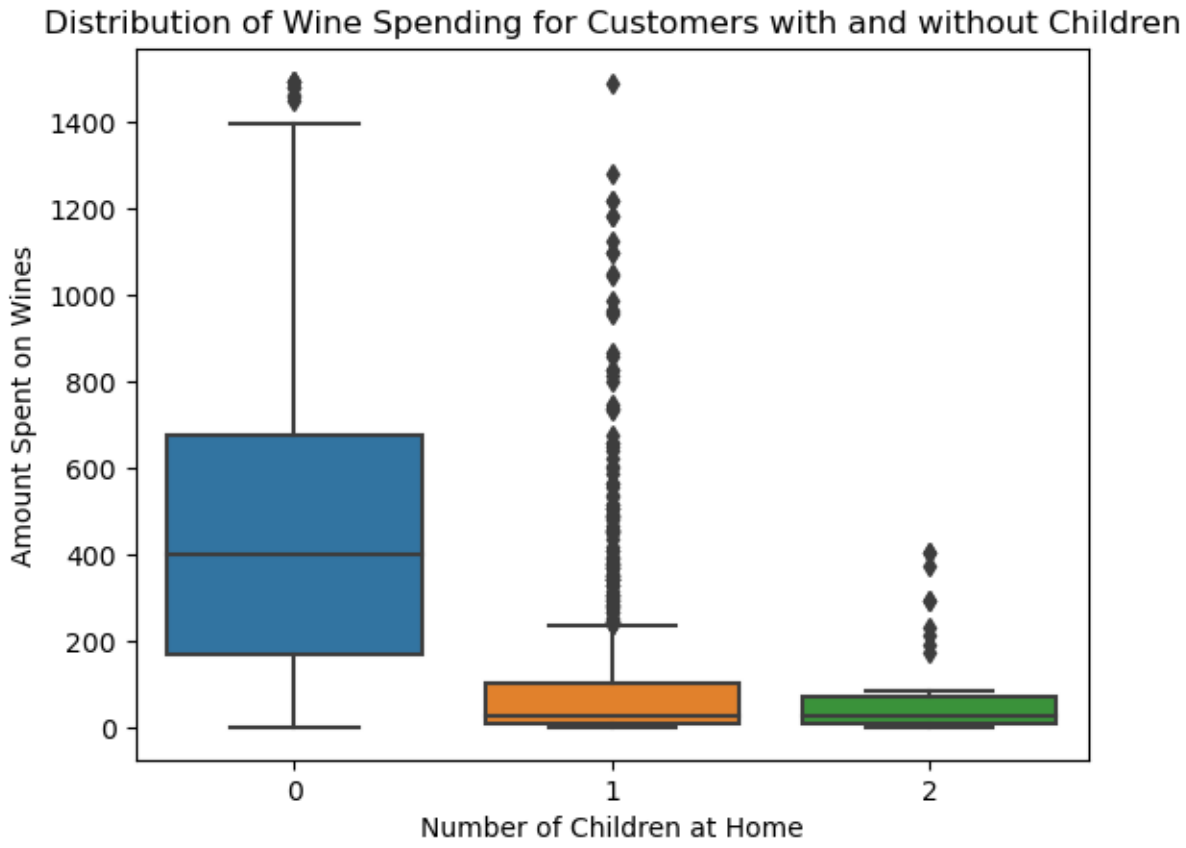
3.4.1 Fruits

- Customers who were Graduates, PhDs, and Masters bought the most Fruit.
- Highest purchasers did not have a kid at home but had 1 teen.
- Highest revenue orders were of 120 quantity.
- Highest spenders had 7 number of deals purchase, 10 number of web purchases, 2 number of catalog purchases, and 12 store purchases.

3.4.2 Wines

- Customers who were PhDs, Graduates, and Masters bought the most Wines.
- Highest purchasers did not have a kid or teen at home. Those with 2 kids at home posted a significantly lower amount spent on wines.
- Highest revenue orders were of 1156 quantity.
- Highest spenders had 2 number of deals purchase, 4-5 number of web purchases, 4 number of catalog purchases, and 4-5 store purchases.


Relationship between Wine Spending and Revenue
Revenue
2500
2000
1500
1000
500
0
0
200
400
600
800
1000
1200
1400
Amount Spent on Wines



3.4.3 Meat

- Customers who were Graduates, PhDs, and 2n Cycle bought the most Meat.
- Highest purchasers either did not have a kid or had 1 kid at home with no teens. Those with 2 kids at home posted a significantly lower amount spent on meats.
- Highest revenue orders were of 915 quantity.
- Highest spenders had 15 number of deals purchase, 0 number of web purchases, 28 number of catalog purchases, and 0-1 store purchases.

3.4.4 Fish

- Customers who were 2n Cycle, Masters, and Graduates bought the most Fish.
- Highest purchasers either did not have a kid or had 1 kid at home with either 0, or 1 teens.

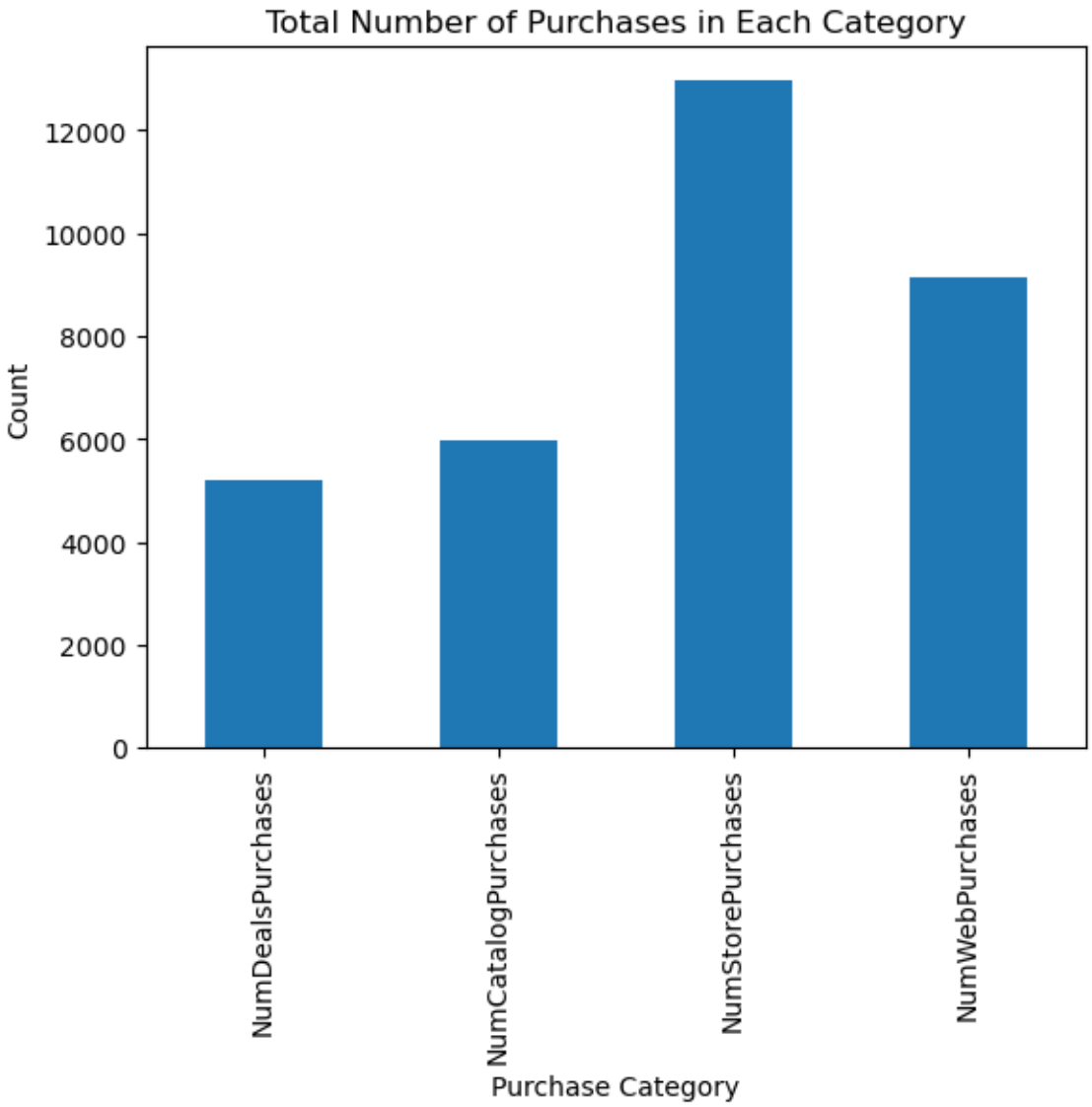
- Highest revenue orders were of 94 quantity.
- Highest spenders had 3 number of deals purchase, 6-7 number of web purchases, 5-6 number of catalog purchases, and 8-12 store purchases.

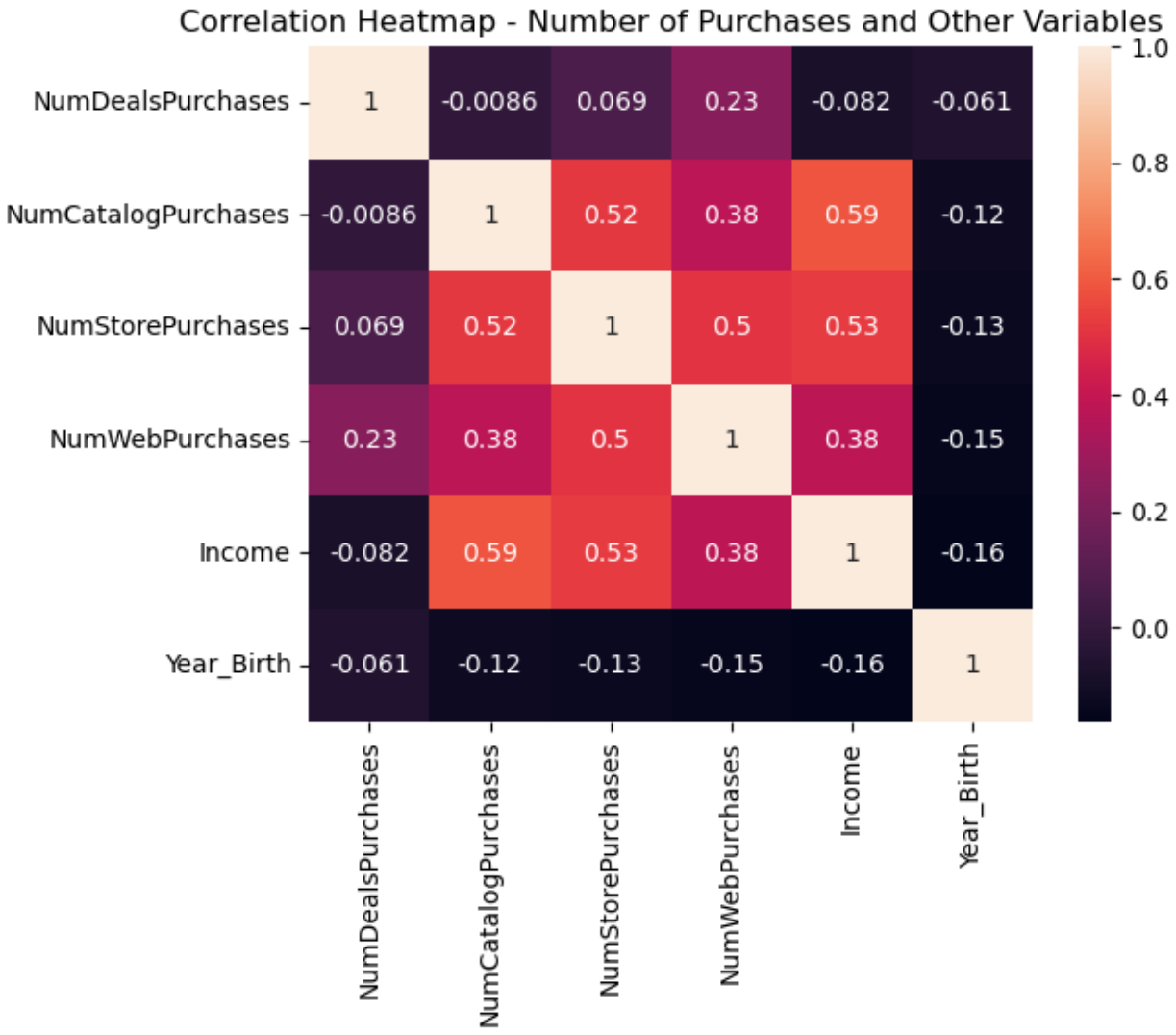
3.4.5 Number of Deals Purchases

- Customers who were 2n Cycle, Graduates, and PhDs bought the most Number of Deals.
- Highest purchasers either did not have a kid or had 1 kid at home with either 0, 1, or 2 teens. Those with 2 kids at home posted a significantly lower amount spent on Fish.
- Highest revenue orders were of 1 quantity.

3.4.6 Number of Web Purchases

- Customers who were Graduates and PhDs had the most Number of Web Purchases.
- Highest purchasers either did not have a kid or had 1 kid at home with either 0, or 1 teens. Those with 2 kids at home posted a significantly lower amount spent on Fish.
- Highest revenue orders were of 3 to 7 quantity.


Total Number of Purchases in Each Category
Count
0
2000
4000
6000
8000
10000
12000
NumDealsPurchases
NumCatalogPurchases
NumStorePurchases
NumWebPurchases
Purchase Category

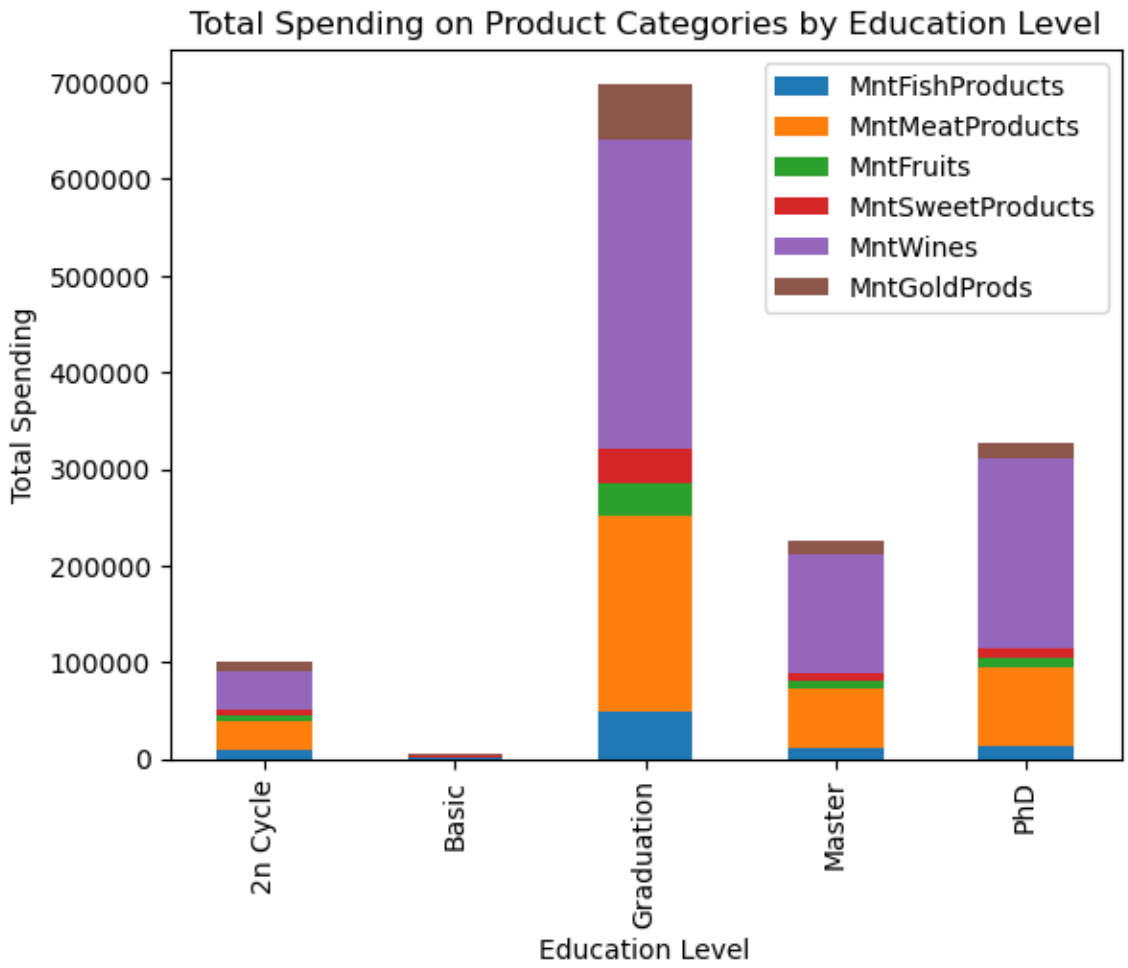


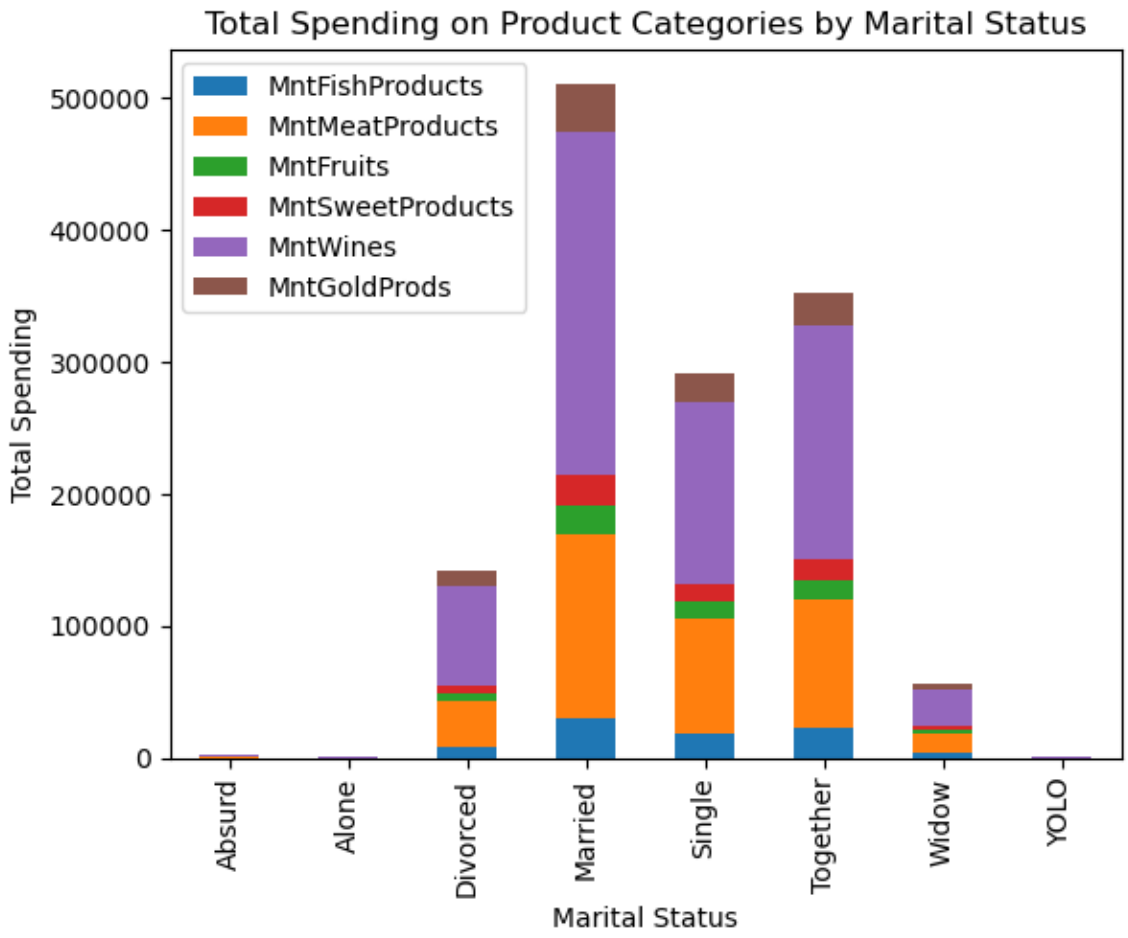
3.4.7 Amount spent on Sweet Products

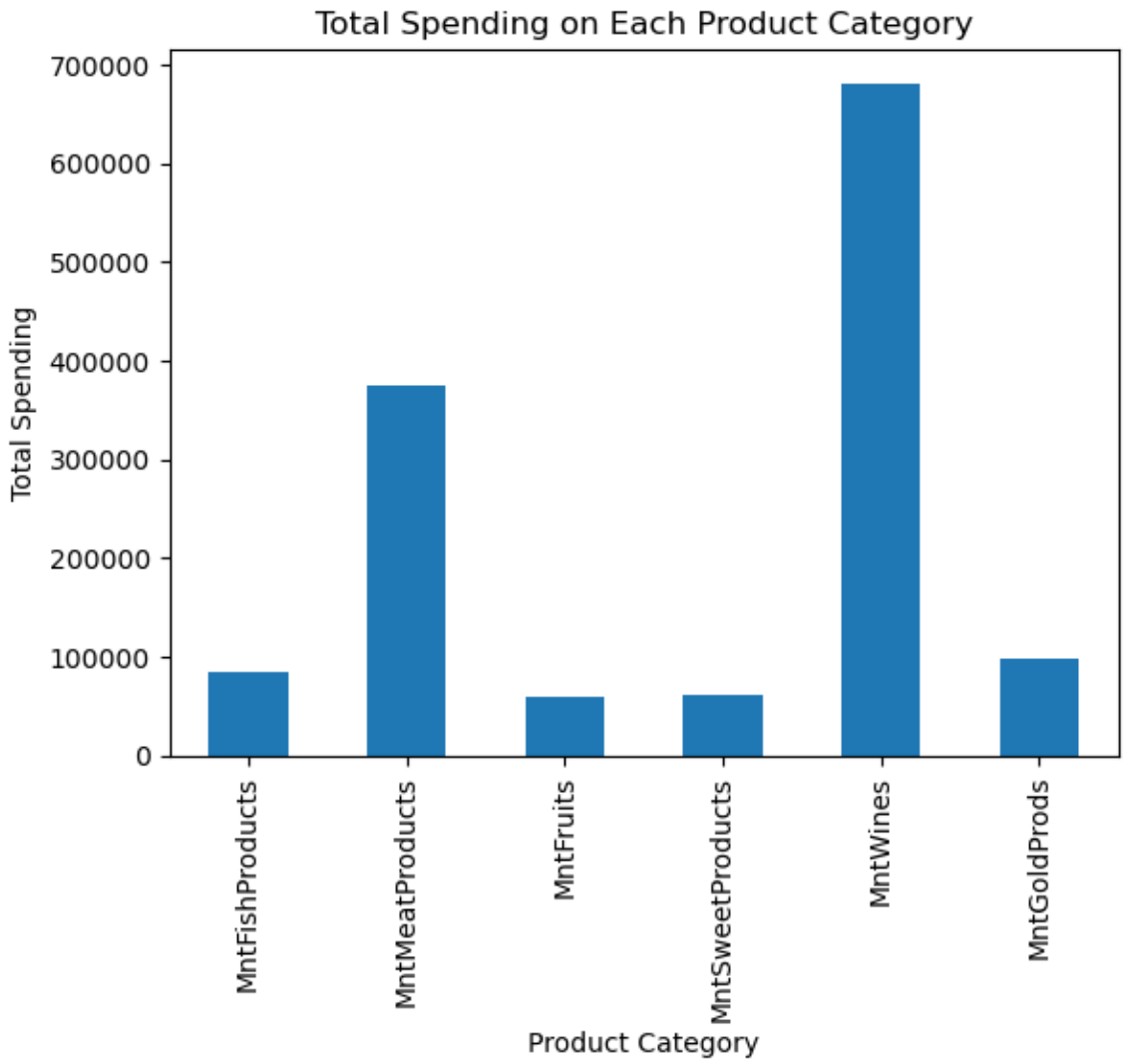
- Highest spenders had 0-1 number of deals purchase, 27 number of web purchases, 0 number of catalog purchases, and 0 store purchases.

3.4.8 Amount spent on Gold Products

- Highest spenders had 0 number of deals purchase, 23-27 number of web purchases, 0 number of catalog purchases, and 0 store purchases.

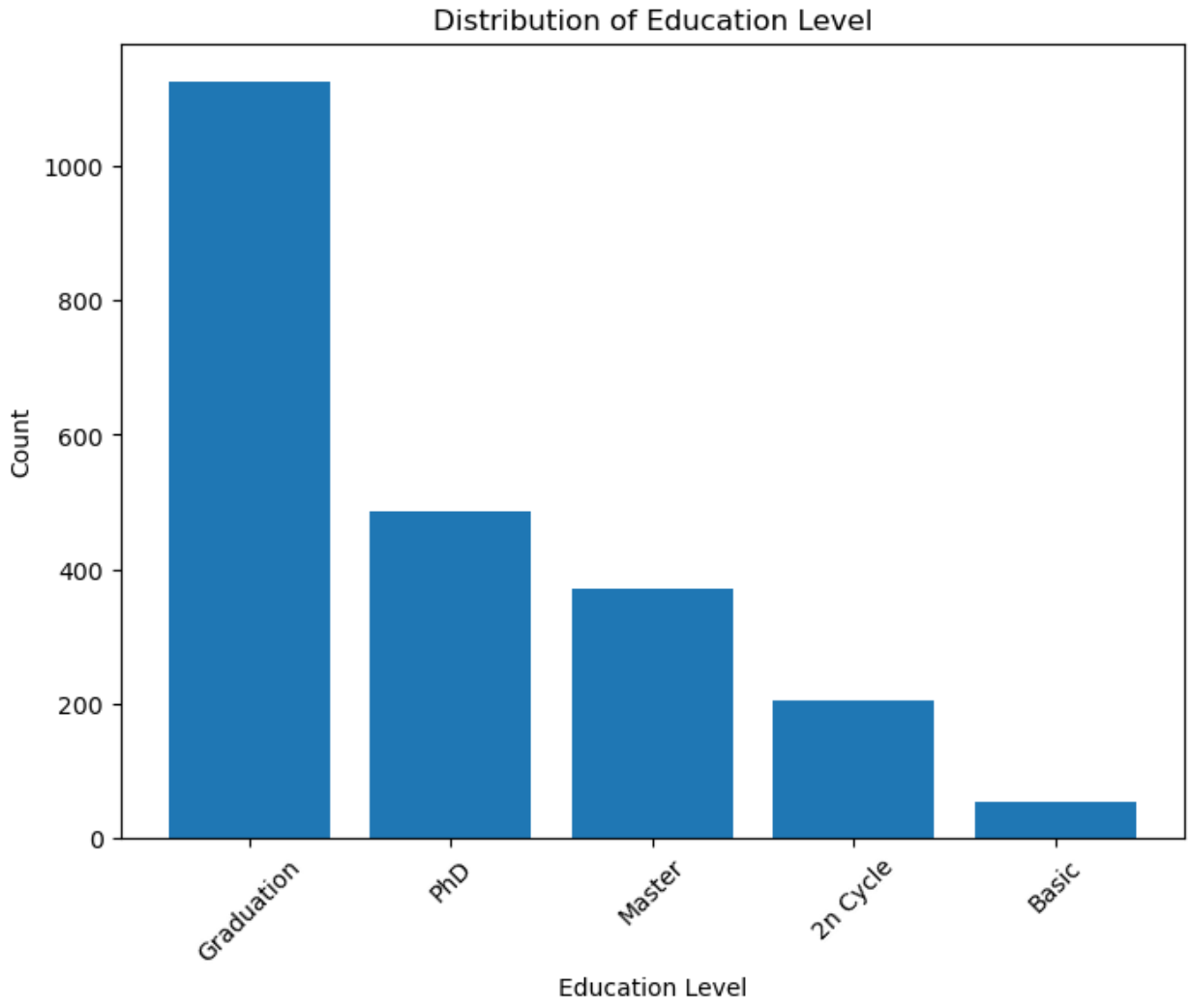

Total Spending on Product Categories by Education Level
MntFishProducts
MntMeatProducts
MntFruits
MntSweetProducts
MntWines
MntGoldProds
Total Spending
0
100000
200000
300000
400000
500000
600000
700000
2n Cycle
Basic
Graduation
Master
PhD
Education Level

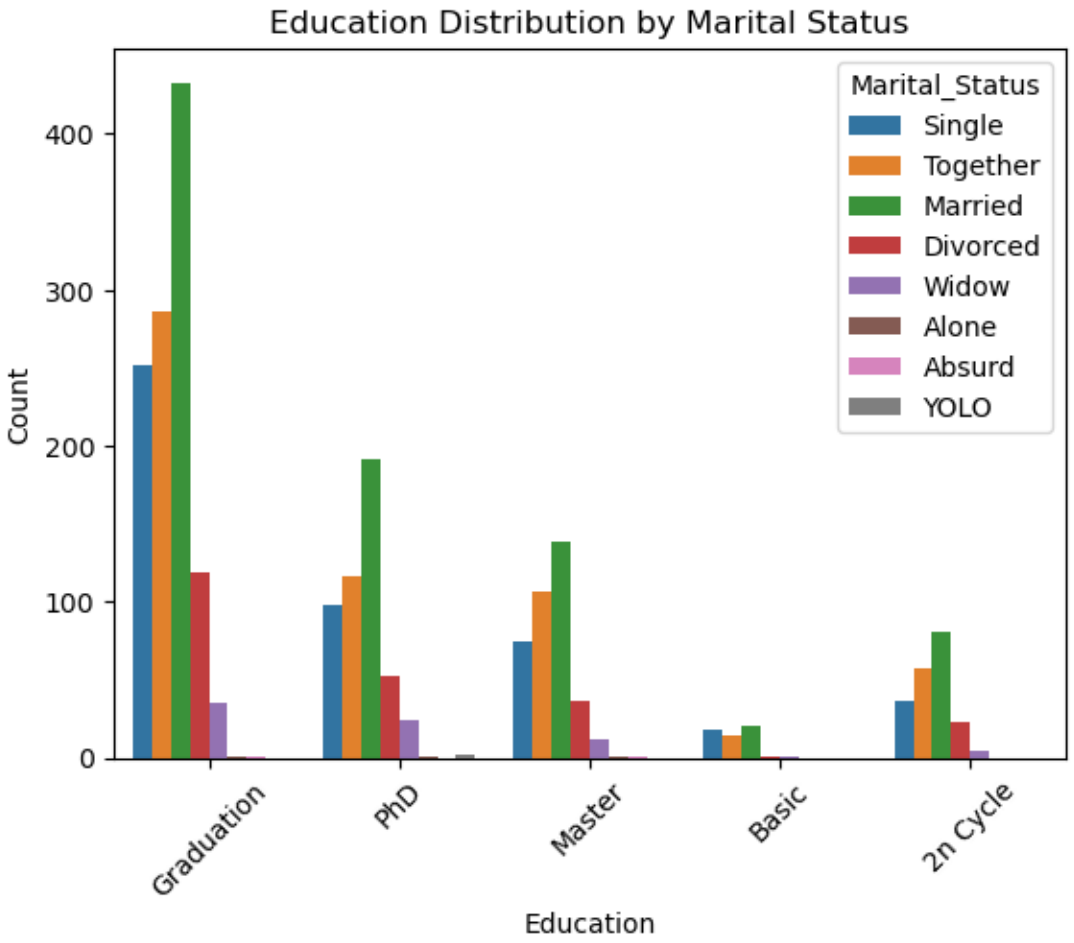

Total Spending on Product Categories by Marital Status
MntFishProducts
MntMeatProducts
MntFruits
MntSweetProducts
MntWines
MntGoldProds
Total Spending
0
100000
200000
300000
400000
500000
Absurd
Alone
Divorced
Married
Single
Together
Widow
YOLO
Marital Status

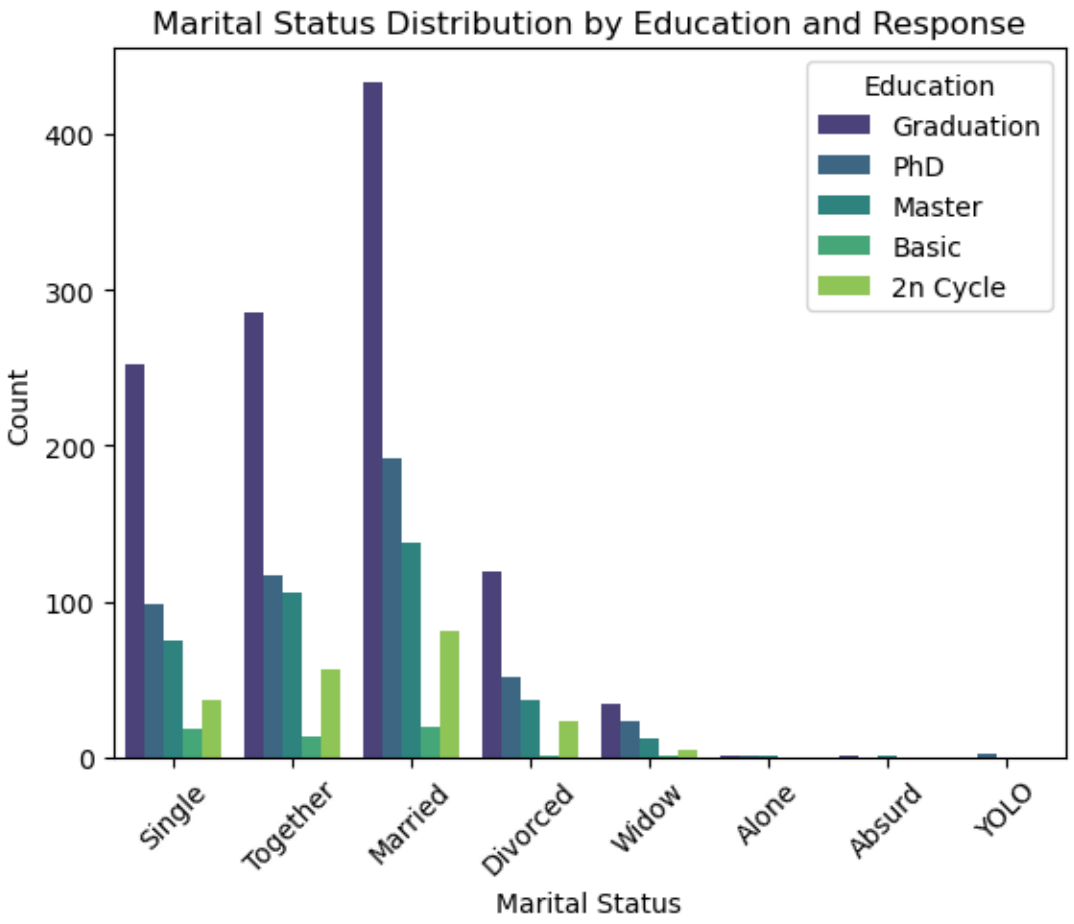


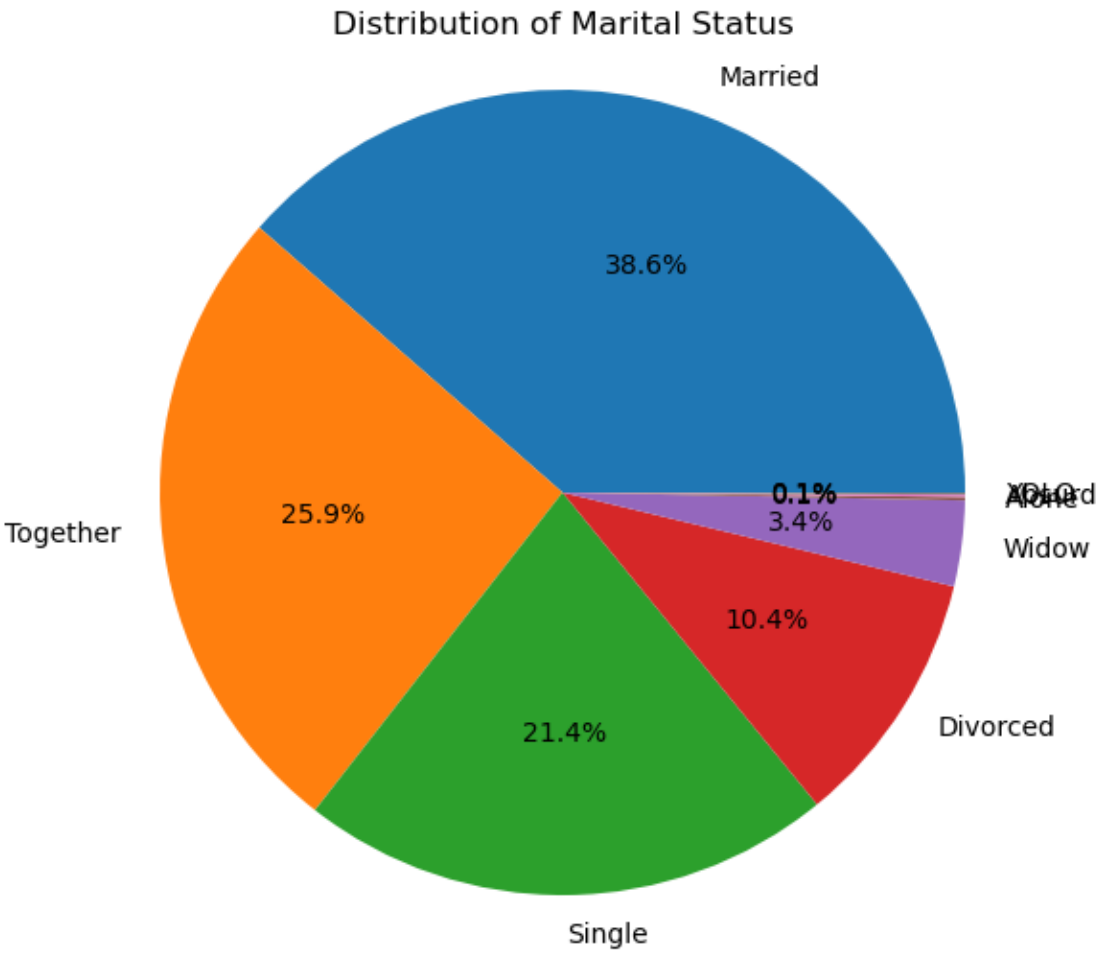
3.5 Demographics

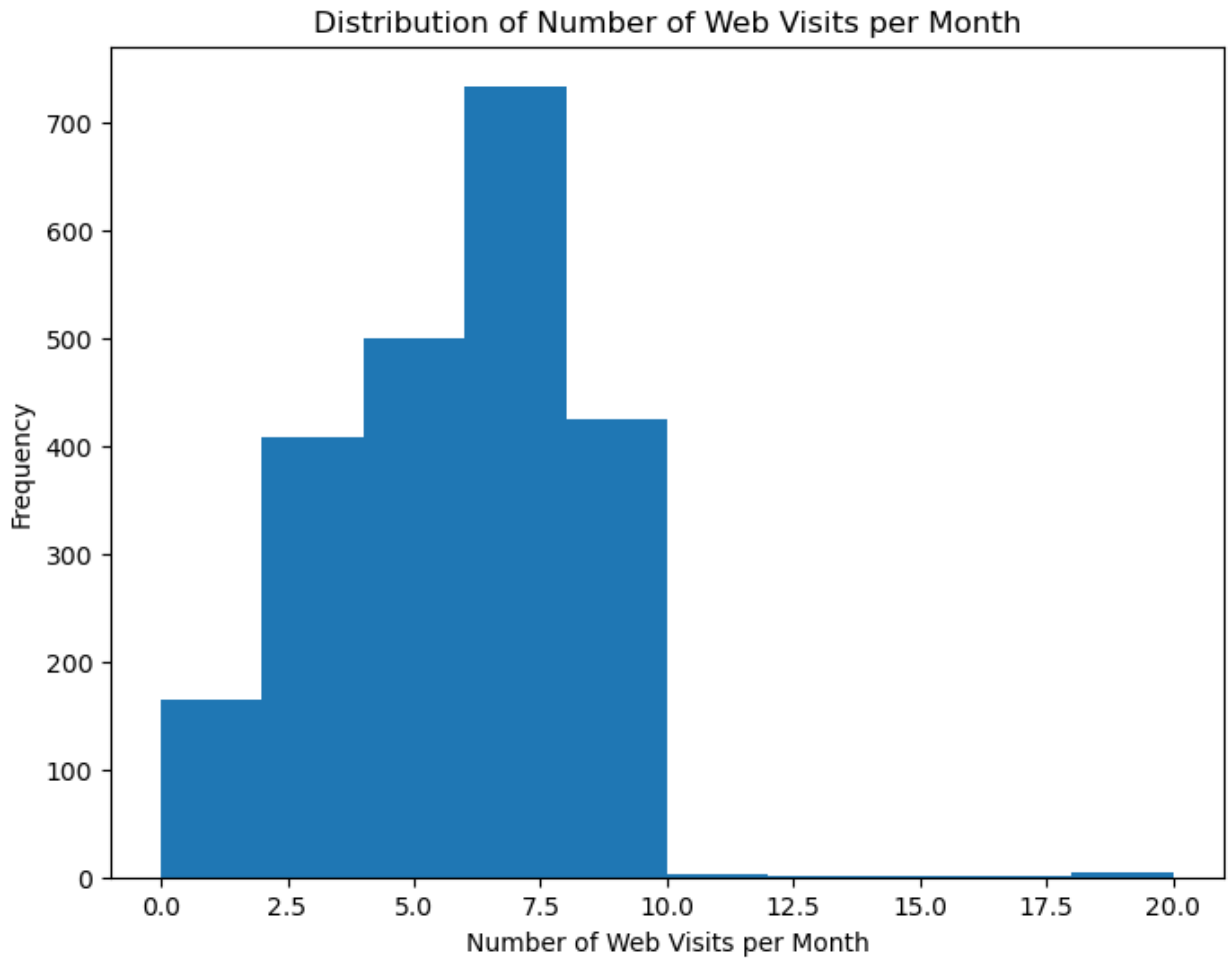
- Highest spenders (Graduates, PhDs, and Masters) were either married or together.
- Most customers had 6 to 8 web visits per month
- Most common Year of Enrollment: 2013


Distribution of Education Level
Count
0
200
400
600
800
1000
Graduation
PhD
Master
2n Cycle
Basic
Education Level


Education Distribution by Marital Status
Marital_Status
Single
Together
Married
Divorced
Widow
Alone
Absurd
YOLO
Count
0
100
200
300
400
Graduation
PhD
Master
Basic
2n Cycle
Education


Marital Status Distribution by Education and Response
Education
Graduation
PhD
Master
Basic
2n Cycle
Count
0
100
200
300
400
Single
Together
Married
Divorced
Widow
Alone
Absurd
YOLO
Marital Status


Distribution of Marital Status
Married
38.6%
Together
25.9%
0.1%
Alone
3.4%
Widow
10.4%
Divorced
21.4%
Single



4. Conclusion

The analysis of the "Marketing Campaign Data" dataset, consisting of 2,240 rows and 30 columns, provided substantial insights into the effectiveness of the marketing campaigns and customer behavior. The dataset was sufficiently cleaned and processed, with missing values in the Income column imputed based on Education, and new columns added to facilitate analysis.

The campaigns targeted a variety of customers, with a particularly successful response to the 4th campaign. Wines emerged as the most popular product category for which customers accepted campaigns. The analysis also revealed that the most significant amount of complaints came from customers spending the highest revenue.

The revenue was found to be intricately linked to several factors such as product category, customer demographics, and customer behavior. The highest revenue came from customers who enrolled in February 2014, were born in 1991, had an income in the range of $85,000-$90,000, did not have a kid or teen at home, and made their last purchase 29 days ago.

The analysis showed a slight increase in invoices recorded in 2022 compared to 2021, with the first quarter of the year being the highest selling period.

Examining spending patterns showed that customers' education level, family composition, and purchasing behavior significantly influenced their spending in different product categories. The highest spenders usually did not have a kid at home and varied in their purchasing behavior across different platforms (deals, web, catalog, store).

In terms of demographics, most customers were Graduates, followed by PhDs and Masters, and were either married or living together. Most customers had 6 to 8 web visits per month, and the most common year of enrollment was 2013.

In conclusion, this analysis provided valuable insights into the customer's responses to marketing campaigns and their spending habits. These insights could be instrumental in shaping future marketing strategies, tailoring campaigns to suit customer preferences, and ultimately driving increased revenue.

5. Recommendations

Based on the conclusions drawn from the analysis, here are some recommendations:

1. **Campaign Focus:** The fourth campaign was the most successful, and wines were the most popular product category for which customers accepted campaigns. It would be beneficial to analyze the specific characteristics and strategies used in the fourth campaign and apply those learnings to future campaigns. Also, focus more on promoting wines as they seem to be a favorite among the customers.
2. **Target Audience:** The analysis indicates that customers who are graduates, PhDs, and Masters, who do not have a kid or teen at home, and were either married or living together were among the highest spenders. Marketing campaigns should be designed to appeal to this demographic.
3. **Engagement Strategies:** Most customers had 6 to 8 web visits per month. Consider strategies to increase engagement, such as personalized recommendations, promotional emails, and engaging content to encourage more frequent visits.
4. **Revenue Boosting:** Customers in the $85,000-$90,000 income range provided the most revenue. Future marketing campaigns could target this income bracket more heavily. Also, it might be beneficial to explore strategies for upselling and cross-selling to customers who have recently made purchases (within the last 29 days) as they have contributed to high revenue.
5. **Complaint Handling:** There seems to be a relationship between the highest revenue customers and the number of complaints. It would be important to investigate the nature of these complaints and address them promptly to ensure customer satisfaction and retain these high-value customers.
6. **Selling Channels:** The patterns in the number of purchases through different channels (deals, web, catalog, store) vary significantly across product categories. Understanding these patterns can help optimize the marketing strategies for each channel and product category.
7. **Seasonal Trends:** The first quarter of the year is the highest selling period, with January, February, and March being the highest selling months. Campaigns and stocks should be planned accordingly to take advantage of these peak periods.

6. Acknowledgments

I would like to express my sincere gratitude to Rodolfo Saldanha for providing the "Marketing Campaign Data" dataset on Kaggle.com. This dataset formed the basis of our analysis, enabling us to gain significant insights into marketing campaign effectiveness and customer behavior.

Further, I would like to acknowledge the robust capabilities of Python and its libraries including NumPy, Pandas, Matplotlib, and Seaborn, which facilitated the comprehensive analysis of the dataset. The Jupyter Notebook provided an interactive environment that made the data analysis process more efficient and accessible.

Finally, I appreciate the team of data analysts, strategists, and marketing enthusiasts who have engaged with this data. Your contributions and interest have been instrumental in driving this analysis, and will undoubtedly contribute to further discoveries and advancements in the field of marketing analytics.

7. References

The analysis used the following libraries and tools:

- NumPy: A library for numerical computing in Python.
- Pandas: A data manipulation and analysis library.
- Matplotlib: A plotting library.
- Seaborn: A data visualization library.
- Jupyter Notebook: An interactive coding environment.

For a detailed understanding of the analysis process, including the Jupyter Notebook code used, please refer to the original analysis documentation.

Best regards,

Nikhil Sharma