Data Engineering and Visualization Mini-Project Task 2

CUSTOMER SEGMENTATION AND ANALYSIS

Submitted in partial fulfilment of the requirement of
the Data Engineering and Visualization Laboratory

Department of Computer Science and Engineering (Data Science)

By

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A.Y. 2023 – 2024

Aim:

Analysing Customer Behaviour and Marketing Campaign Responses for Strategic Insights

Data Description:

1. **ID**: Unique identifier for each customer.
2. **Year_Birth**: Birth year of the customer.
3. **Education**: Level of education of the customer.
4. **Marital_Status**: Marital status of the customer.
5. **Income**: Annual income of the customer.
6. **Kidhome**: Number of young children in the customer's household.
7. **Teenhome**: Number of teenagers in the customer's household.
8. **Dt_Customer**: Date when the customer was enrolled as a customer.
9. **Recency**: Number of days since the last purchase.
10. **MntWines**: Total amount spent on wines.
11. **MntFruits**: Total amount spent on fruits.
12. **MntMeatProducts**: Total amount spent on meat products.
13. **MntFishProducts**: Total amount spent on fish products.
14. **MntSweetProducts**: Total amount spent on sweet products.
15. **MntGoldProds**: Total amount spent on gold products.
16. **NumDealsPurchases**: Number of purchases made with discount deals.
17. **NumWebPurchases**: Number of purchases made through the company's website.
18. **NumCatalogPurchases**: Number of purchases made through catalogs.
19. **NumStorePurchases**: Number of purchases made directly in stores.
20. **NumWebVisitsMonth**: Number of visits to the company's website per month.
21. **AcceptedCmp3** to **AcceptedCmp1**: Whether the customer accepted marketing campaign 3 to 1.
22. **AcceptedCmp2**: Whether the customer accepted marketing campaign 2.
23. **Complain**: Whether the customer has complained in the past.
24. **Z_CostContact**: Fixed cost of contacting the customer.
25. **Z_Revenue**: Fixed revenue from contacting the customer.
26. **Response**: Whether the customer responded to the marketing campaign (1 for yes, 0 for no).

Data Preprocessing and EDA (Task 1):

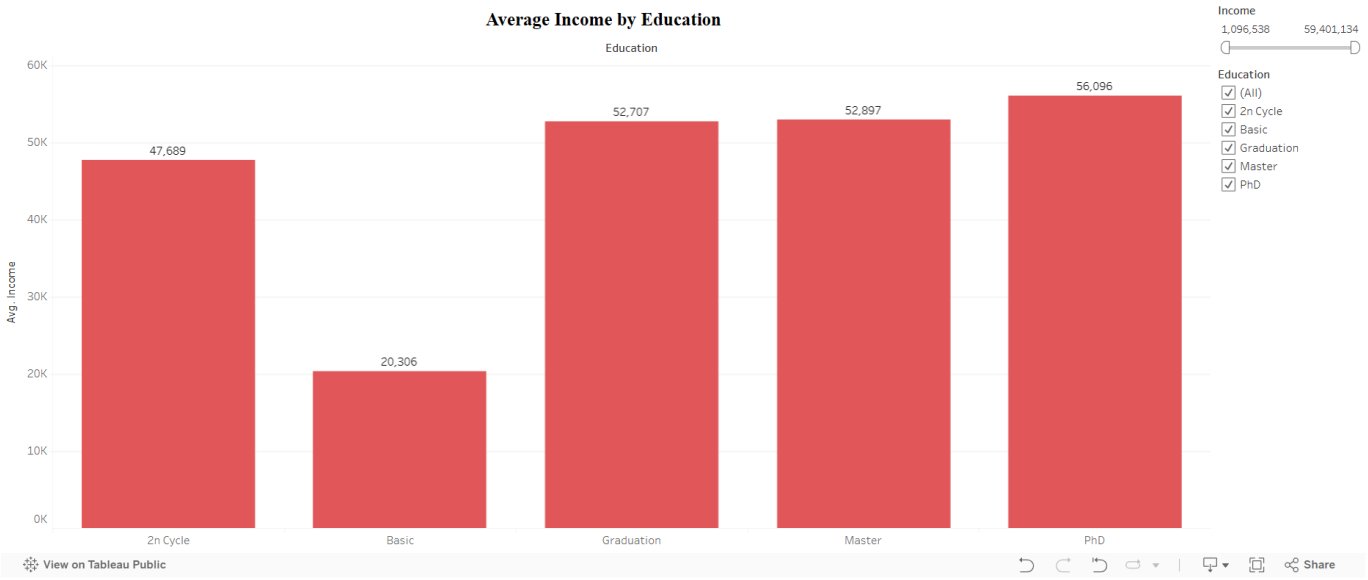
https://colab.research.google.com/drive/1AugOXnEqlicXDWeSj3FERf9rJ1mLoYjM#scrollTo=cecsJeFQ1NED

Tableau Screenshots (Task 2):

Sheets

Customer Segmentation and Analysis by Advay Sharma

Income by Education | Recency Trend | Complain Trend | Recency vs Spending | Income by Marital Staus | Income Distribution | Web Purchases Distribution | Customer Segmentation | CSA Part 1 | CSA Part 2



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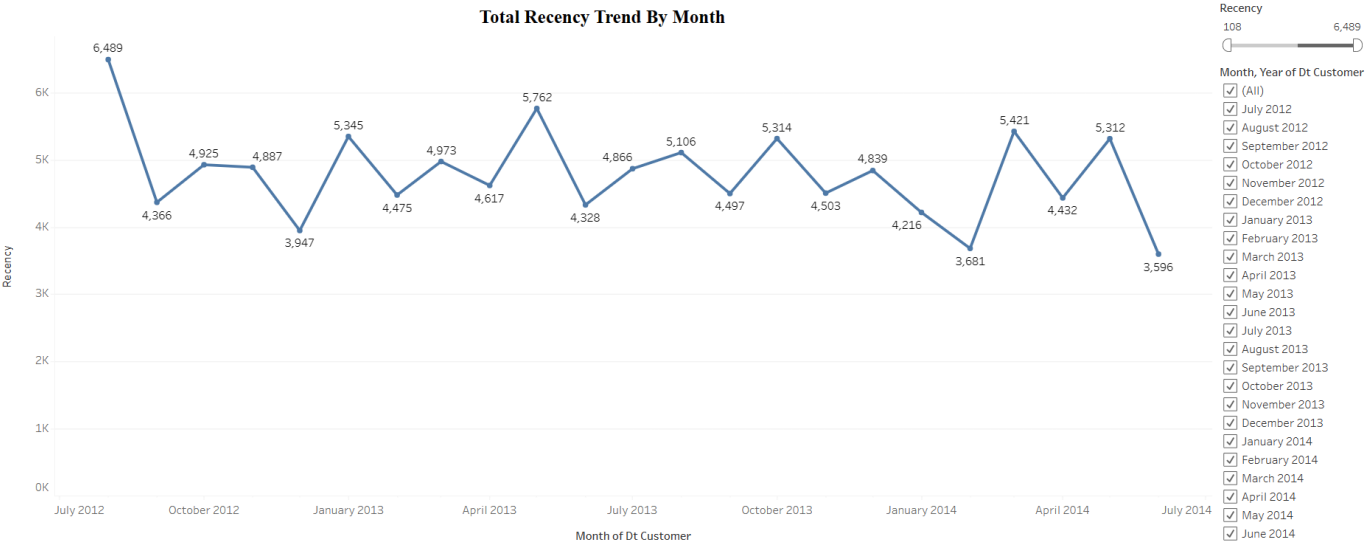

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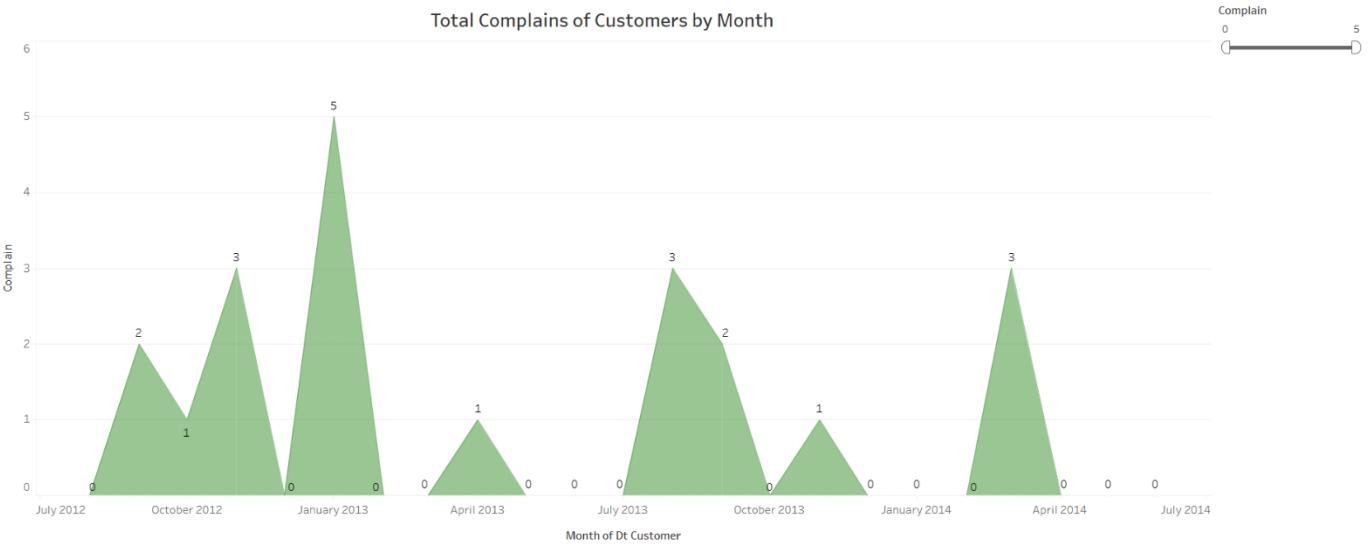

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Recency vs Spending by Education

Recency
2,616 56,390

Graduation
Total Recency: 56,390
Total Wine Spending: 320,371
Total Fruits Spending: 34,683
Total Sweet Spending: 35,351
Total Gold Spending: 57,307

Master
Total Recency: 17,607
Total Wine Spending: 123,238
Total Fruits Spending: 8,012
Total Sweet Spending: 7,835
Total Gold Spending: 14,947

PhD
Total Recency: 23,563
Total Wine Spending: 196,585
Total Fruits Spending: 9,744
Total Sweet Spending: 9,828
Total Gold Spending: 15,703

2n Cycle
Total Recency: 9,829
Total Wine Spending: 40,231
Total Fruits Spending: 5,878
Total Sweet Spending: 6,953
Total Gold Spending: 9,419

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Total Income By Marital Status

Marital Sta..	
Divorced	12,257,541
Married	44,687,978
Single	24,481,244
Together	30,869,362
Widow	4,343,980

Marital Status
- (All)
- Absurd
- Alone
- Divorced
- Married
- Single
- Together
- Widow
- YOLO

Income
4,343,980 44,687,978

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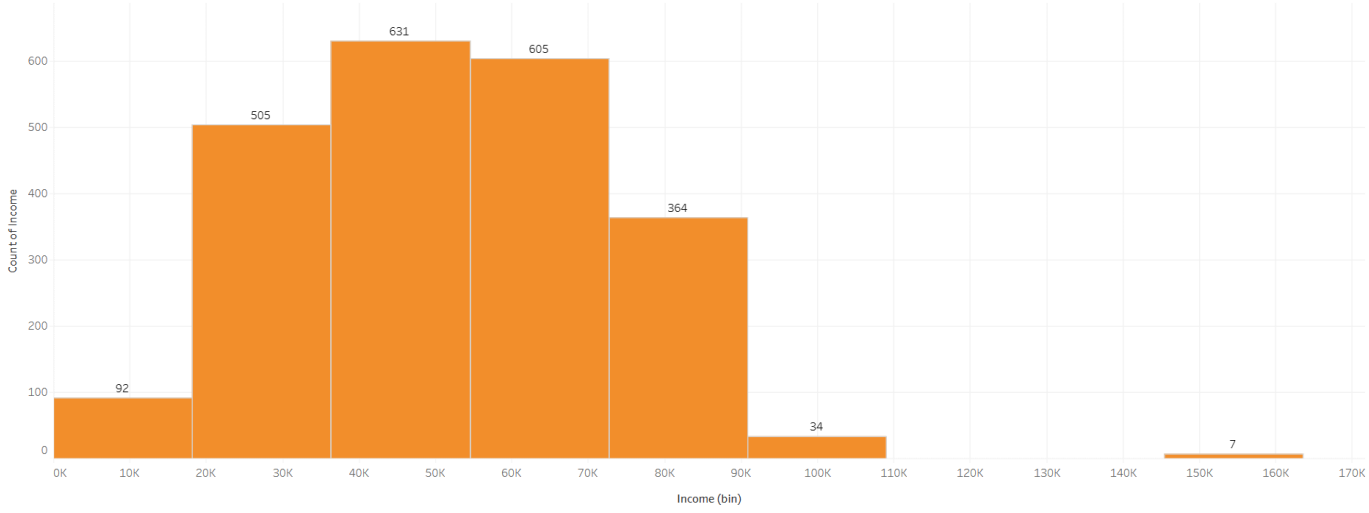
Income Distribution



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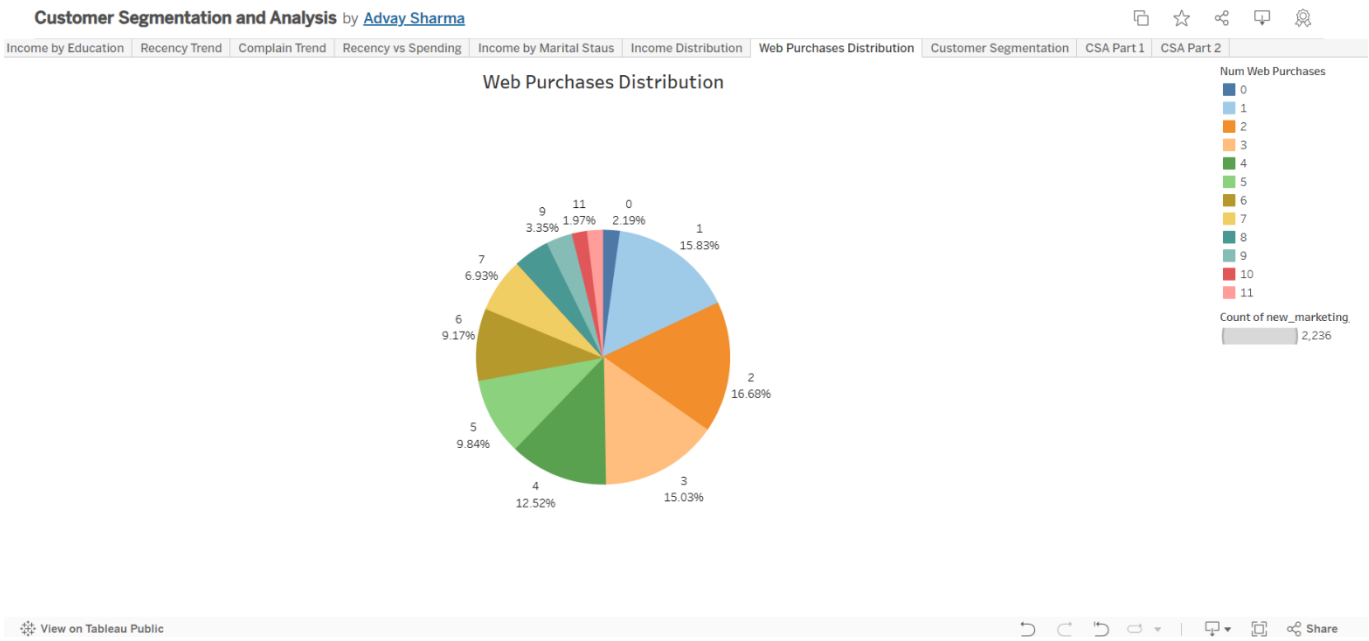
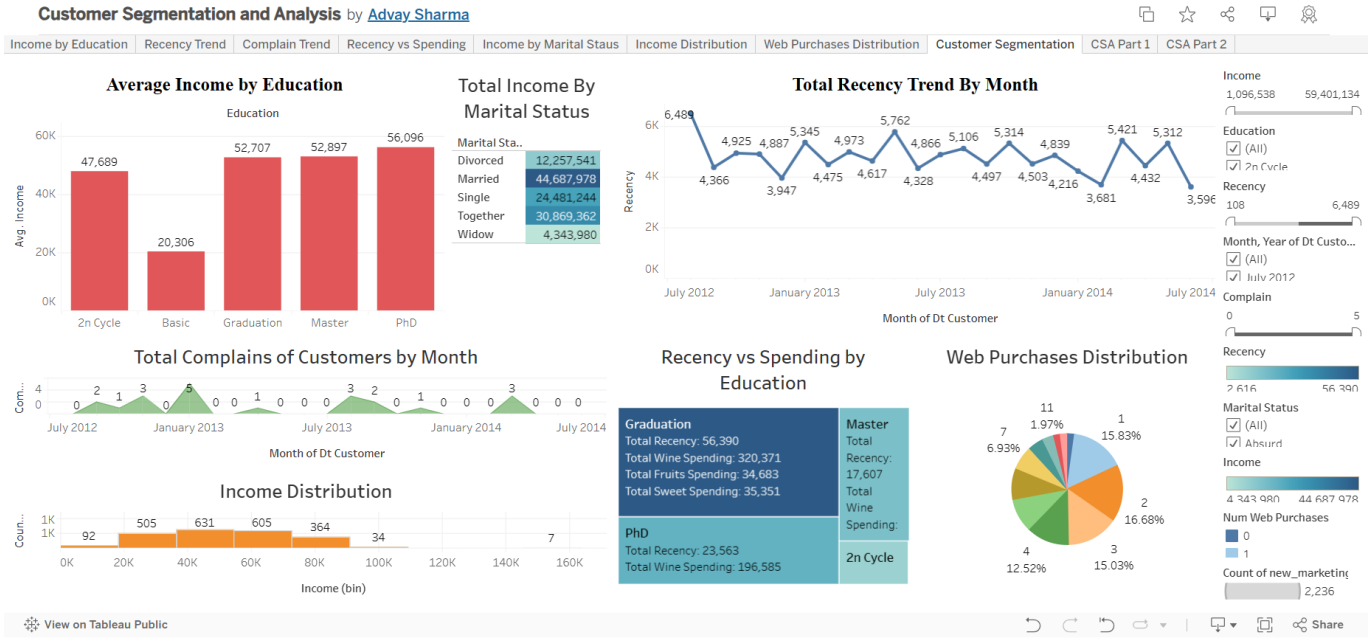


DASHBOARD



STORY

Customer Segmentation and Analysis by Advay Sharma

Income by Education | Recency Trend | Complain Trend | Recency vs Spending | Income by Marital Staus | Income Distribution | Web Purchases Distribution | Customer Segmentation | CSA Part 1 | CSA Part 2

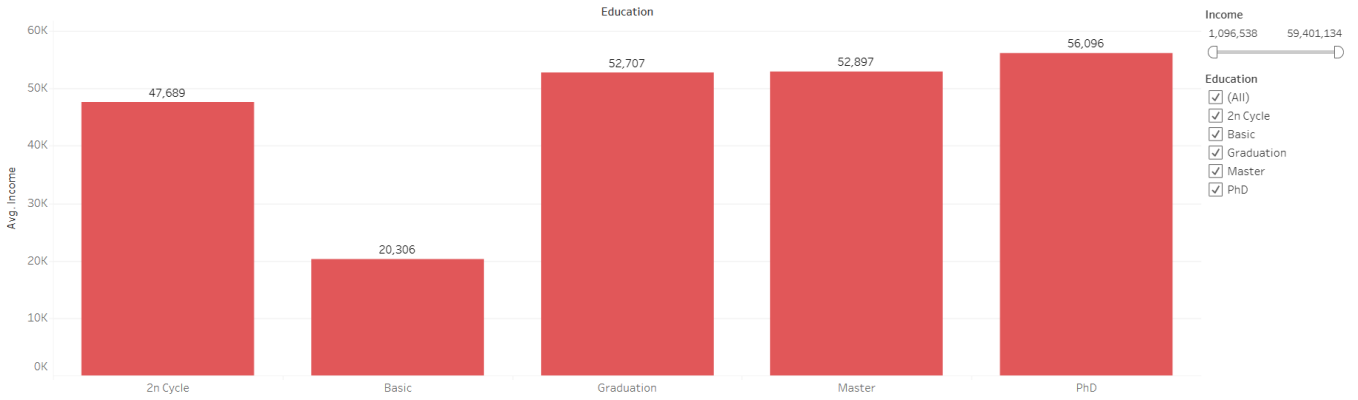
Customer Segmentation and Analysis Part 1

PhD on an Average has the higher income than others while Basic Education has the least average

August 2012 witnessed highest Recency June 2014 witnessed lowest Recency

Many Customers Complained in January 2013 whereas other months witnessed decent number

People with Graduation did spend the most gold with high recency



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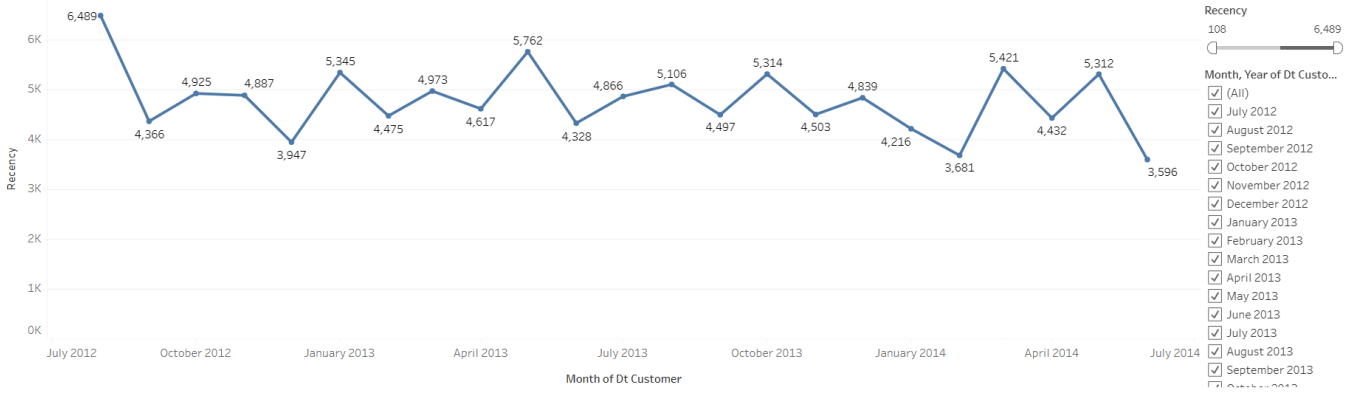

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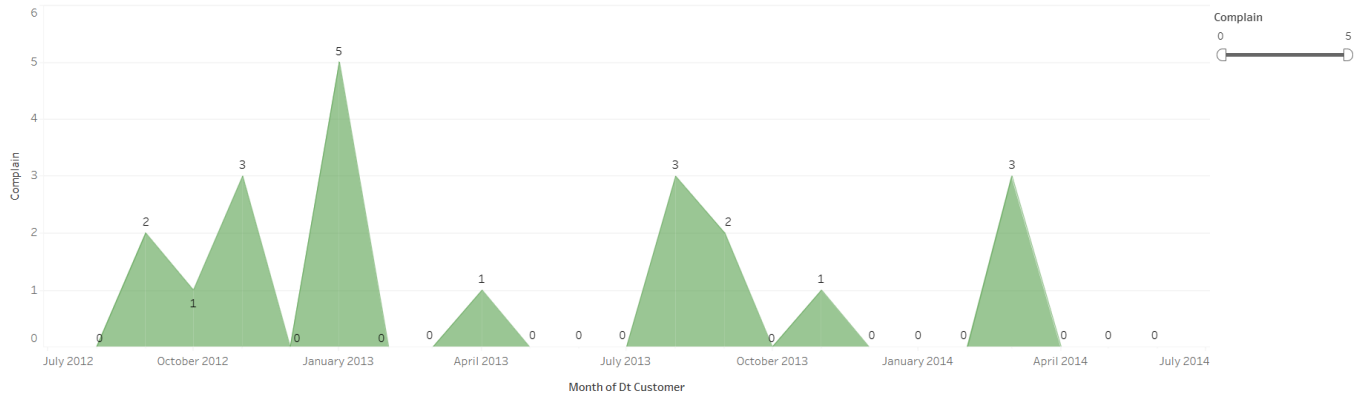

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Customer Segmentation and Analysis Part 2

Total Income of Married People is highest while that by Widow Customers is the lowest

Maximum people have income between 36K and 54K

Most people did 2 Web Purchases. Apart from that 1 and 3 web pages also were common.

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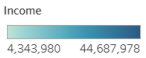

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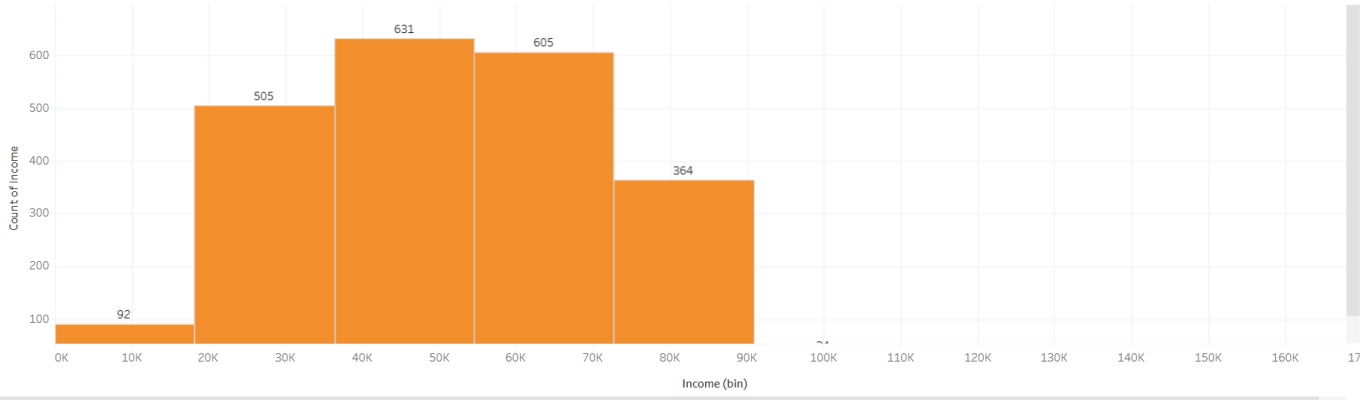

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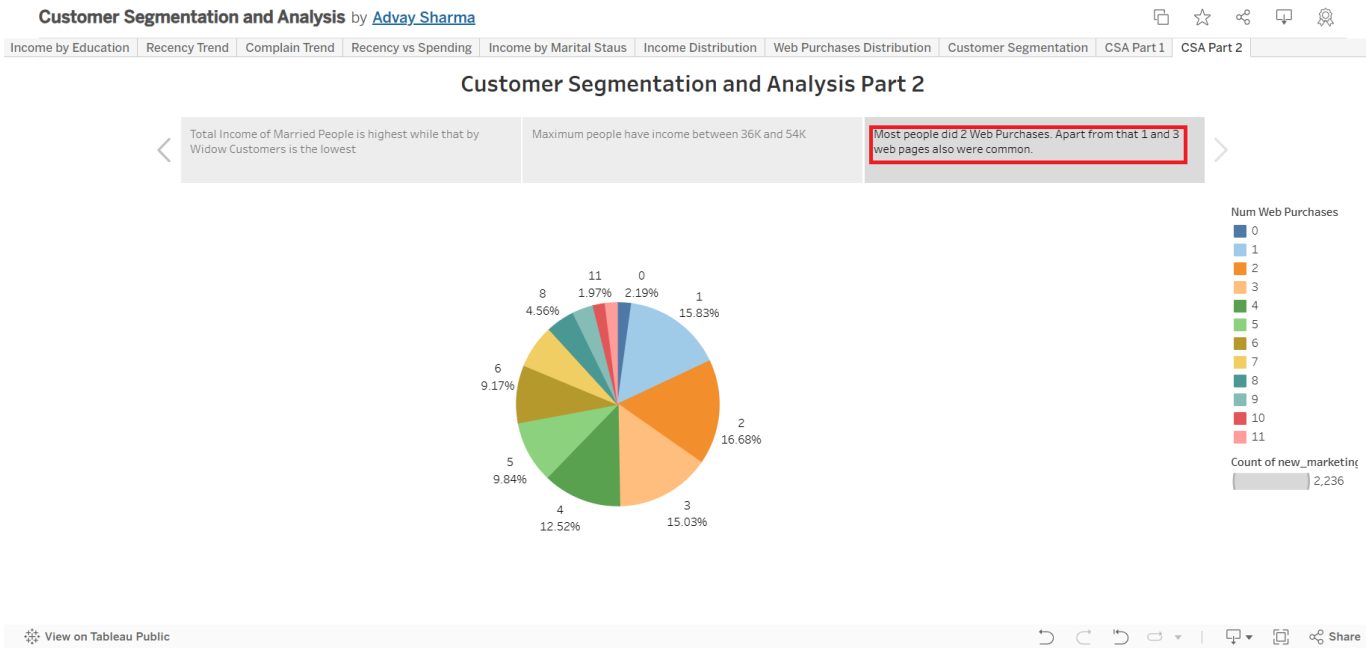

CONCLUSION:

In this experiment, we meticulously pre-processed customer data using Python, filling missing values and categorizing variables. We then visualized various aspects of the data using Tableau, including trends, correlations, and response distributions. Our analysis was consolidated into a comprehensive dashboard, offering interactive insights into customer behaviour and campaign effectiveness. Through storytelling, we effectively communicated key findings and implications. This integrated approach showcases the synergy between Python and Tableau in deriving actionable insights from complex datasets.