



AllLife Bank

CUSTOMER SEGEMENTATION
by **JAKE EIDE**

CONTENTS

- Business Overview & Solution Approach
- Data Overview
- Exploratory Data Analysis
- Model Overview and Performance Summary
- Key Findings and Insights
- Business Recommendations

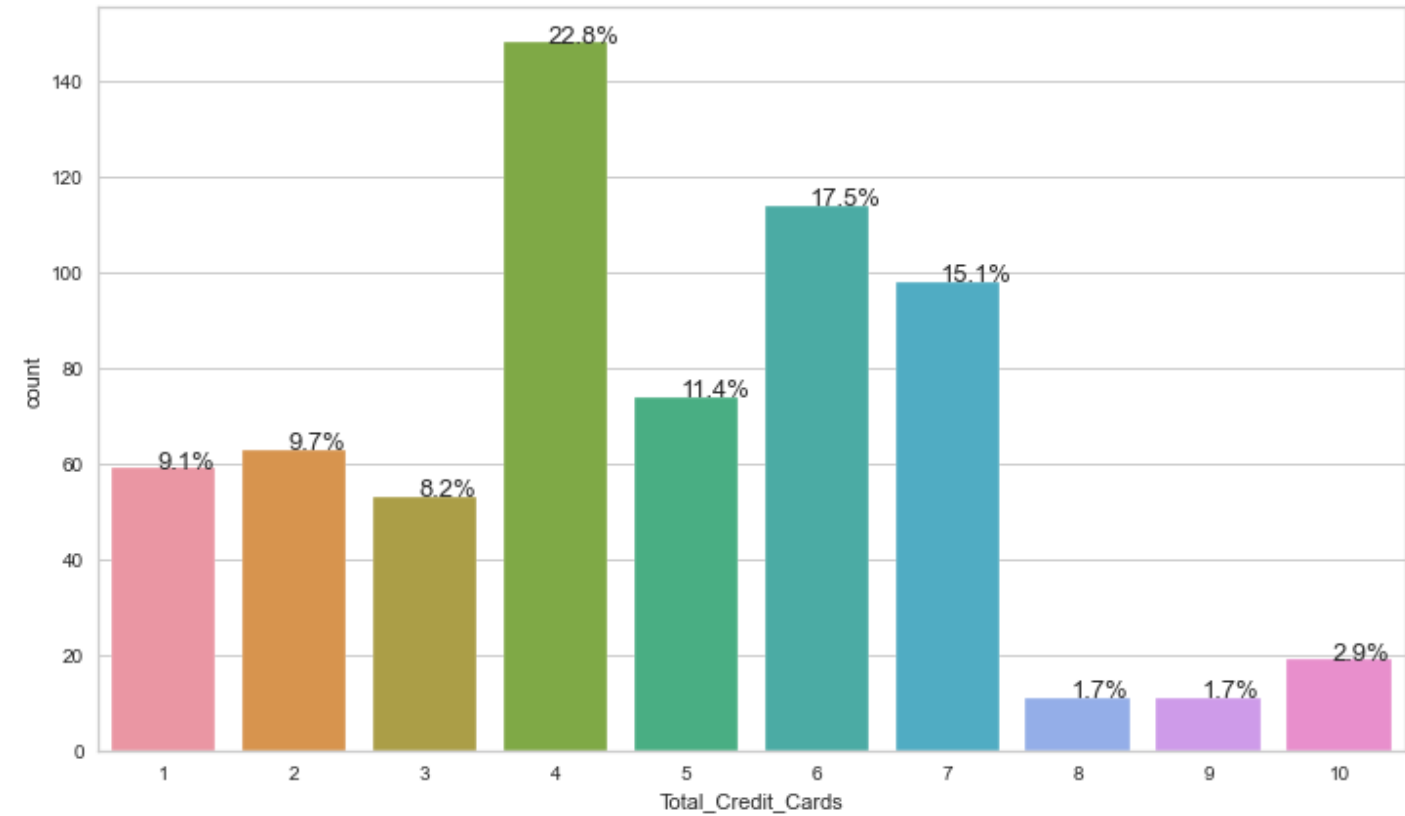
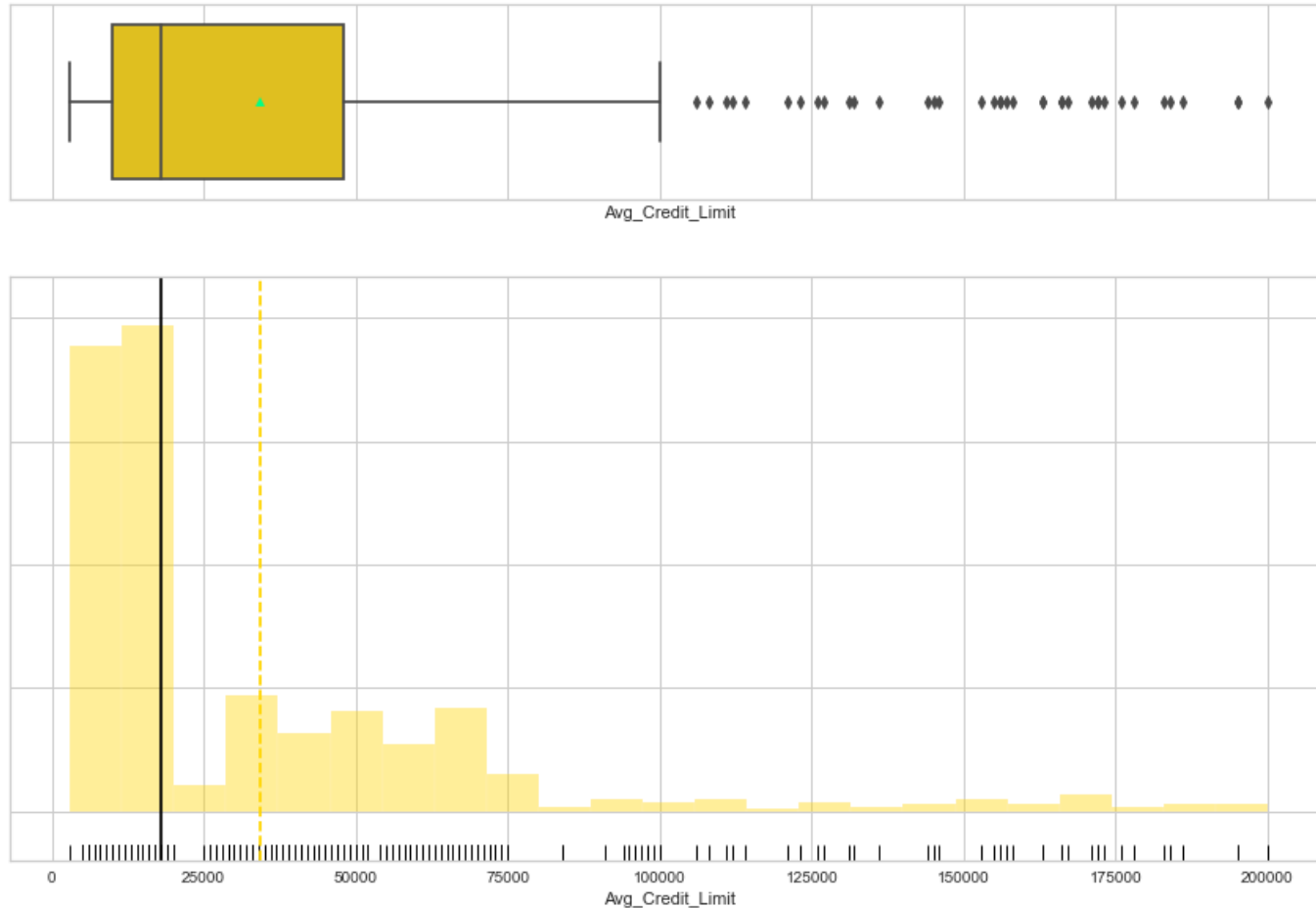
OVERVIEW & SOLUTION APPROACH

- The bank's penetration in the credit card market is not as good as it could be.
- Customers perceive the support services of the bank poorly.
- The solution to this problem is to better target the needs of credit card customers (existing and new customers), as well as offer more personalized customer service.
- Using clustering algorithms, I will identify different segments in the existing customers, based on their spending patterns as well as past interactions with the bank.
- Through customer segmentation, I will generate a set of insights and recommendations to help the bank improve their marketing and better service their customers.

DATA OVERVIEW

- The data used to create segments contains information about 650 AllLife Bank credit card customers.
- The information includes five columns of data:
 - Average credit limit of each customer for all credit cards
 - Total number of credit cards possessed by the customer
 - Total number of Visits that customer made (yearly) personally to the bank
 - Total number of visits or online logins made by the customer (yearly)
 - Total number of calls made by the customer to the bank or its customer service department (yearly)
- There were originally 660 rows in the data set, but I removed 10 rows because there were duplicates in the Customer Key column.

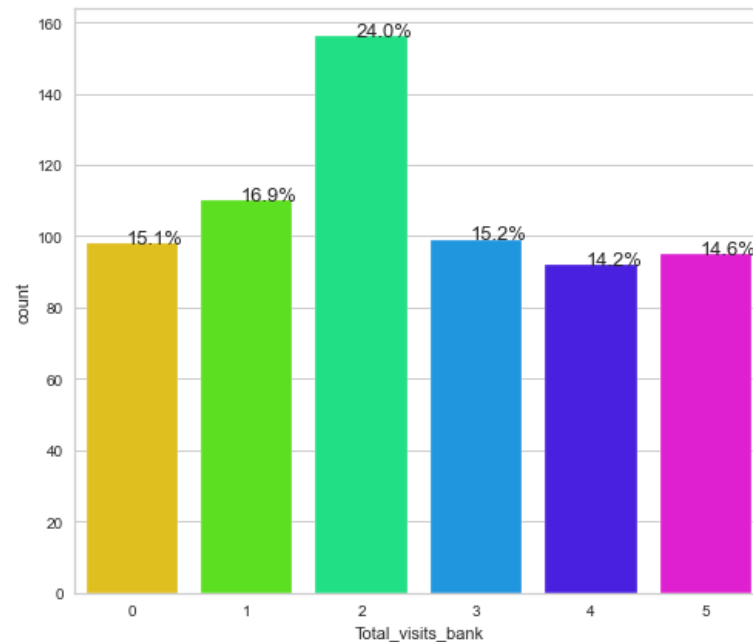
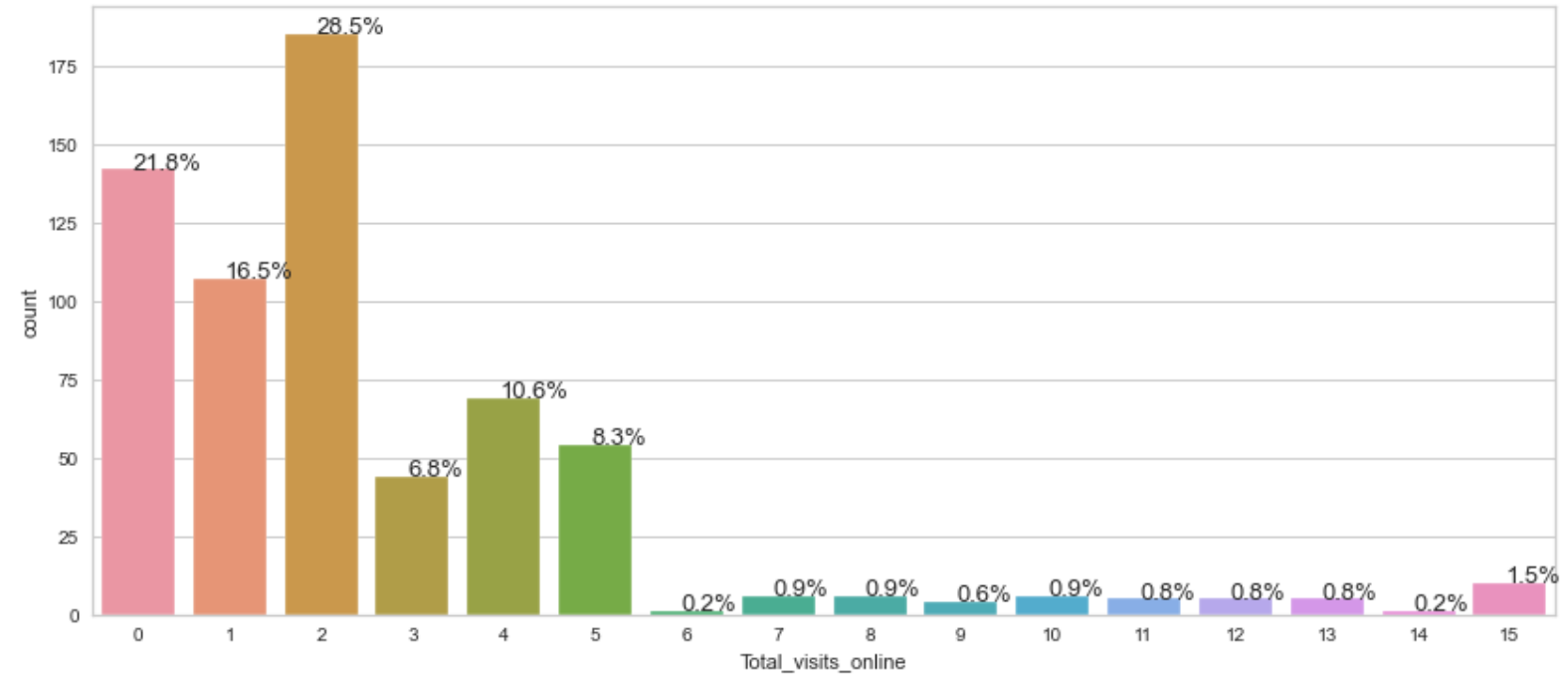
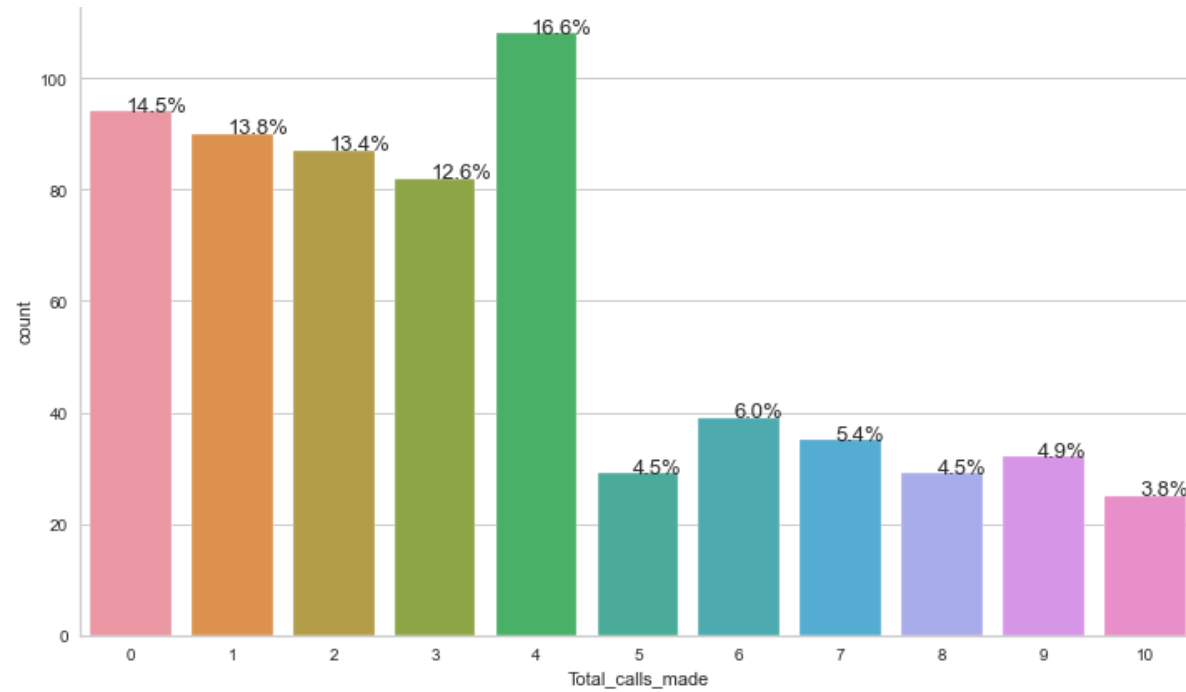
EXPLORATORY DATA ANALYSIS



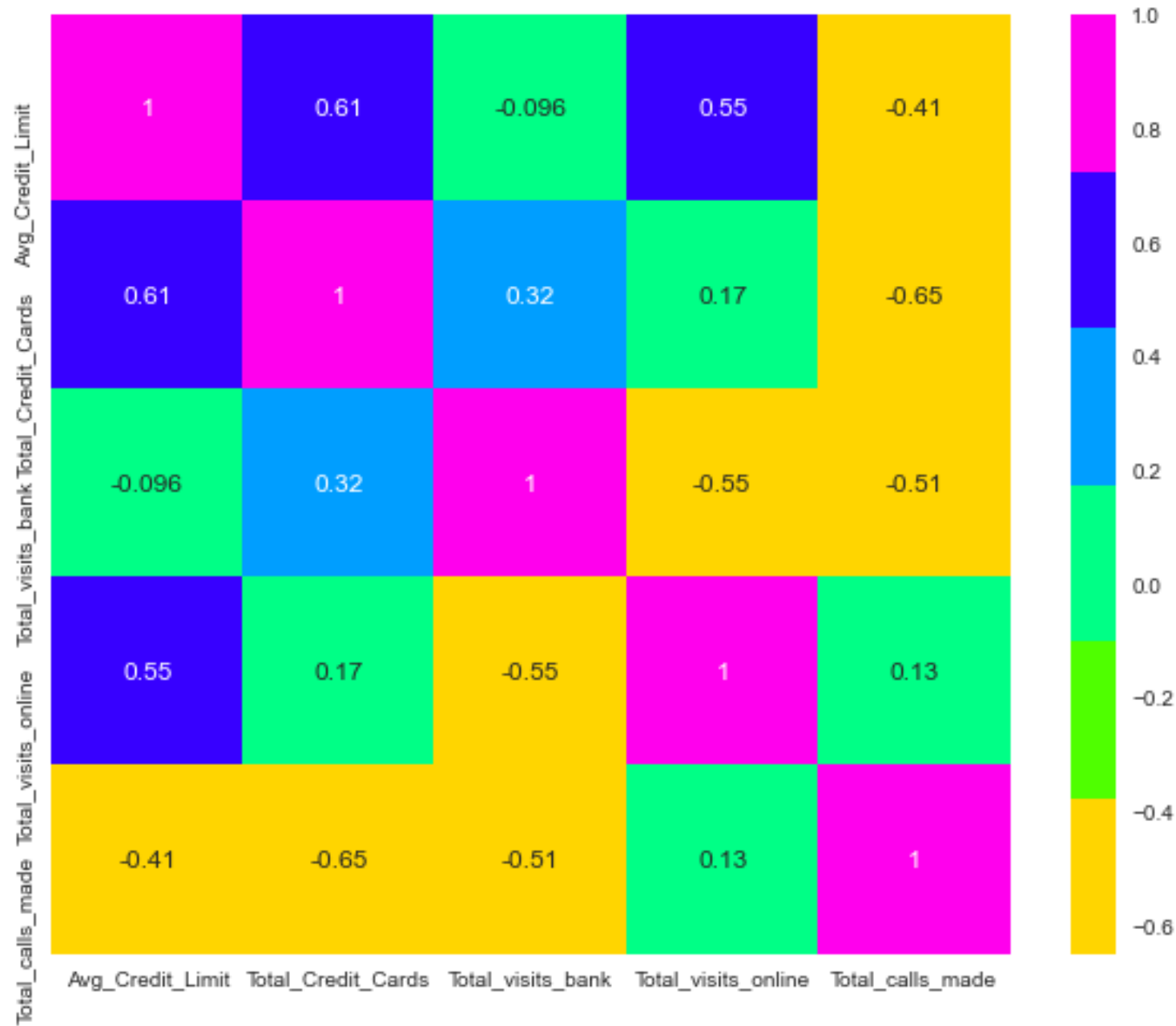
- Most of AllLife's customers have an average credit limit between \$10,000 and \$50,000, but there are some customers with much higher credit limits.

- About 23% of customers have 4 credit cards, whereas customers with 8, 9, or 10 cards collectively only make up about 6% of customers.

EXPLORATORY DATA ANALYSIS



- Calls made: while some customers make up to 10 calls per year, it is much more common for customers to make 4 or fewer calls
- Online banking visits: the majority of customers make 5 or fewer logins per year
- In-person visits to the bank: values range from 0 to 5 visits per year, with most customers visiting the bank twice

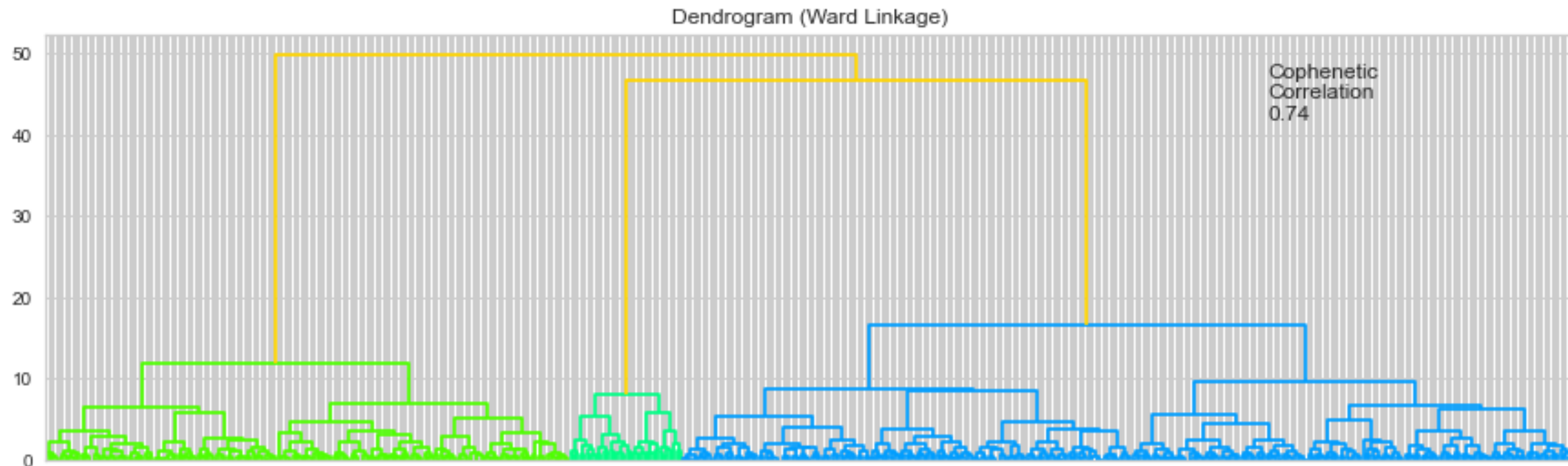


EXPLORATORY DATA ANALYSIS: BIVARIATE CORRELATION

- The correlation absolute values range between 0.65 and 0.09, showing that the correlation between the columns are generally moderate
- The highest correlation (-0.65) is between `Total_Credit_Cards` and `Total_calls_made`; the negative correlation indicates that those with more credit cards tend to call the bank less often
- `Total_Credit_Cards` and `Avg_Credit_Limit` has the second highest correlation, indicating that those with more credit cards have a higher combined credit limit

MODEL PERFORMANCE SUMMARY

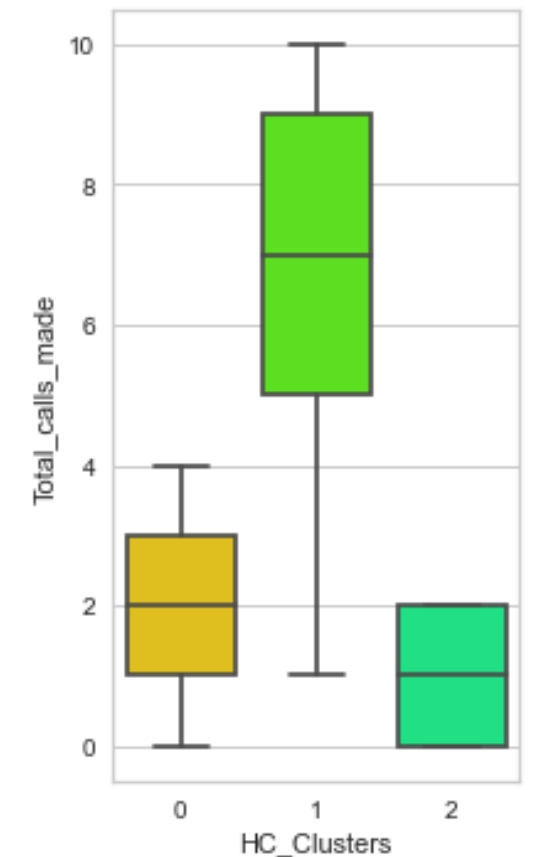
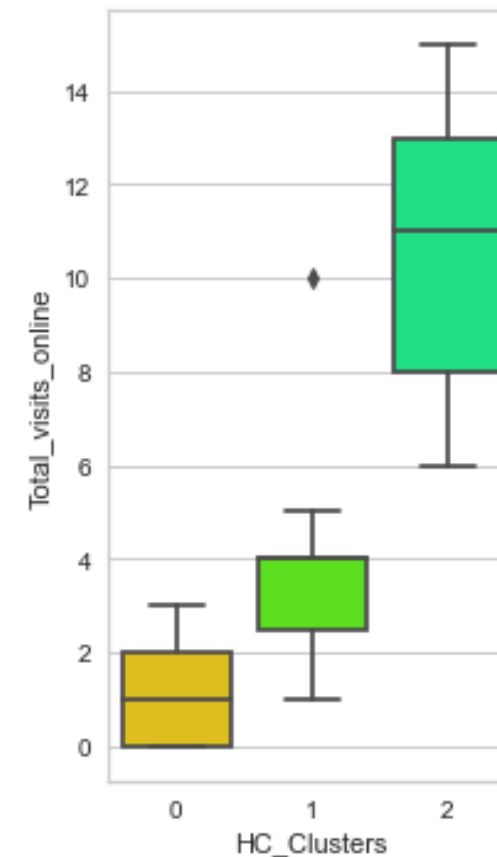
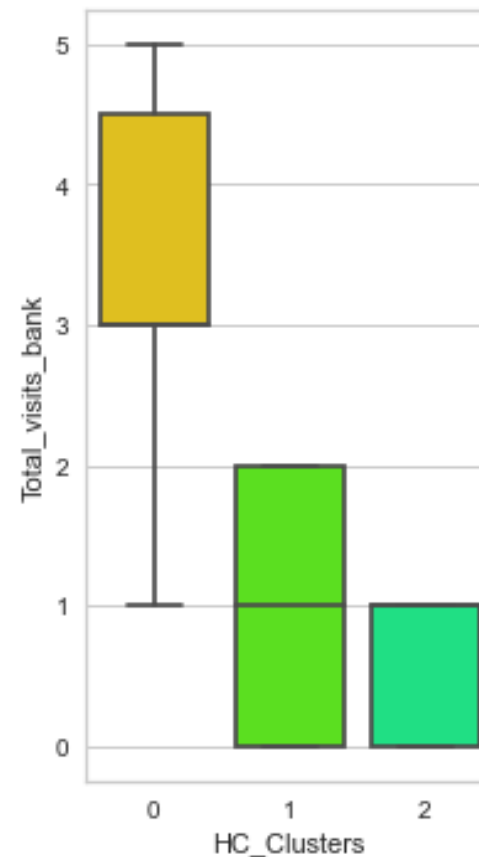
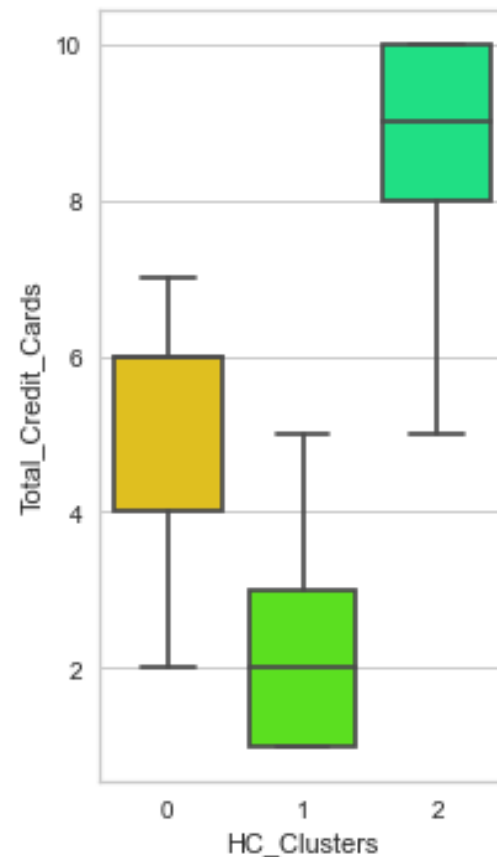
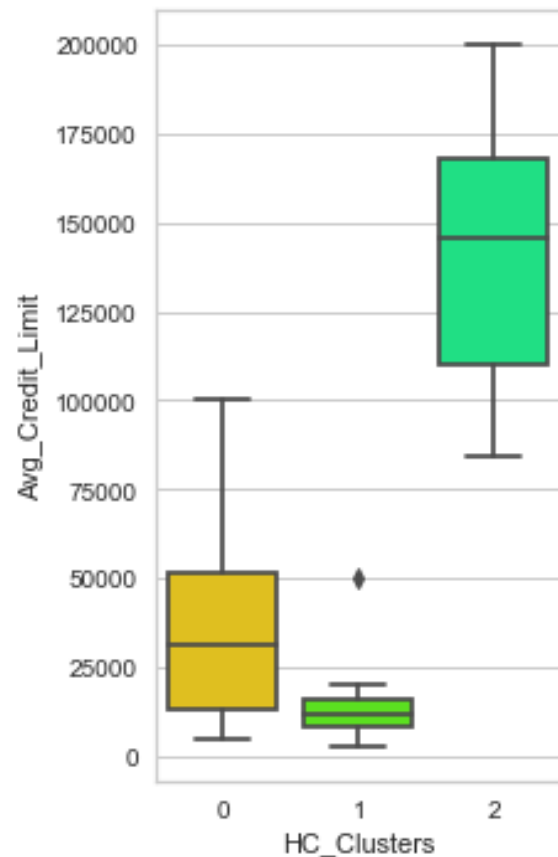
- The clustering algorithm that I chose to use:
 - Hierarchical Clustering, Euclidean Distance, and Ward Linkage
- The cophenetic correlation for this algorithm was about 0.74
 - There were other linkage methods with higher cophenetic correlation scores, but a dendrogram showed that the ward linkage method created the most distinct and separate clusters
- The algorithm showed that 3 was optimal number of clusters, with a silhouette score of 0.51



MODEL OVERVIEW

- the 3 distinct customer segments (aka clusters) are numbered 0, 1, and 2
- The box plots below shows how the different clusters vary across our 5 columns

	Avg_Credit_Limit	Total_Credit_Cards	Total_visits_bank	Total_visits_online	Total_calls_made	count_in_each_segments
HC_Clusters						
0	33701.846966	5.514512	3.490765	0.978892	2.005277	379
1	12156.950673	2.417040	0.941704	3.560538	6.838565	223
2	140937.500000	8.833333	0.604167	10.958333	1.062500	48



KEY FINDINGS & INSIGHTS

Cluster 0

- This is the largest segment, accounting for about 58% of customers
- These customers have middle-of-the-road credit limits and number of credit cards
- The customers in this group have the highest number of in-person visits to the bank, and the least amount of online visits
- These customers call the bank between 0 to 4 times per year

Cluster 1

- This segment makes up roughly 34% of customers
- These customers have the lowest credit limits, and also the lowest number of credit cards
- They make the most calls to the bank compared to other groups; these customers average 7 calls per year
- These customers only visit the bank around once per year, and have between 2 and 5 online visits per year

Cluster 2

- Only about 7% of customers fall in this segment
- These customers have the highest credit limits, and also the highest number of credit cards
- This cluster visits the bank less than any other group, but does more online banking than other clusters
- Less calls are made to the bank by these customers

BUSINESS RECOMMENDATIONS

I recommend creating focused marketing campaigns and customer service strategies that fit the needs of three distinct customer segments. These should be tailored toward how the different segments of customers interact with the bank – online, via telephone, or in person.

- **IN THE BANK MARKETING:** Cluster 0 is your average customer. Their credit limit averages around \$34,000 and they are likely to have 4 to 6 credit cards. Customers in this segment make more in-person visits to the bank than any other group. I suggest reaching these customers through in-person marketing offers while they are in the bank. Any marketing that is performed inside of the bank (examples included signage or flyers) should be tailored to this segment. Banking clerks and staff should be trained on how to best provide customer service and make relevant credit card offers to cluster 0. This segment does very little online banking, and is likely to call the bank 1 to 3 times per year, so these are probably not the best ways to reach this segment.
- **TELEPHONE MARKETING:** Cluster 1 is the segment of customers with the lowest credit limits and lower number of credit cards. I recommend targeting these customers through telephone services. This segment makes more calls to the bank or its customer service department than any other segment. These customers prefer to use the phone, so I suggest targeting this group via phone calls. As noted previously, customers perceive the support services of the bank poorly, so the customer service phone department should be trained on how to best serve this segment of customers.
- **ONLINE MARKETING:** Affluent cardholders primarily fall into cluster 2. These customers do not call or make in-person visits very often, so these will not be effective places to reach this audience. Cluster 2 does use online banking more than any other group, so I suggest using internet based marketing and customer service portals to serve wealthier customers. I would suggest considering launching an online advertising campaign targeting affluent credit card users.



Thank you

CUSTOMER SEGEMENTATION
by **JAKE EIDE**