**Capstone Project: Analytical CRM Development for a Bank**

**Objective Questions:**

1. What is the distribution of account balance across different regions?

|  |  |
| --- | --- |
| Geographical Location | Account Balance |
| France | 311.33M |
| Germany | 300.4M |
| Spain | 153.12M |

**Ans:** Distribution of account balance across different regions:

2. Identify the top 5 customers with the highest estimated salary in the last quarter of the year. (SQL)

**Ans:**

3. Calculate the average number of products used by customers who have a credit card. (SQL)

**Ans:** average number of products used by customers who have a credit card are **'1.5314'**

4. Determine the churn rate by gender for the most recent year in the dataset.

|  |  |  |
| --- | --- | --- |
| Gender | Churn Rate | Year |
| Female | 25.05% | 2019 |
| Male | 15.37% | 2019 |

**Ans:** the churn rate by gender for the most recent year in the dataset is given below

5. Compare the average credit score of customers who have exited and those who remain. (SQL)

**Ans:** Average credit score of customers who have exited and those who remain is

|  |  |
| --- | --- |
| Exited | Average Credit Score |
| 1(Exited) | 645.3515 |
| 0(Remain) | 651.8532 |

The customers who were exited had the less average Credit Score as compare to the customers who remained.

6. Which gender has a higher average estimated salary, and how does it relate to the number of active accounts? (SQL)

**Ans:**

|  |  |  |
| --- | --- | --- |
| Gender Category | Average Salary | Active Category |
| Female | 99866.69 | Active Member |
| Female | 102337.77 | Inactive Member |
| Male | 99600.91 | Active Member |
| Male | 99818.87 | Inactive Member |

**Female** gender has a higher average estimated salary which is ‘**102337.77’** and it is from **inactive category.**

7. Segment the customers based on their credit score and identify the segment with the highest exit rate. (SQL)

**Ans:**

Credit score Segments are given below:

Excellent: 800–850

Very Good: 740–799

Good: 670–739

Fair: 580–669

Poor: 300–579

And the highest exit rate is in **Poor** credit score segment and it is ‘**0.2202’.**

8. Find out which geographic region has the highest number of active customers with a tenure greater than 5 years. (SQL)

**Ans: France** has the highest number of active customers with a tenure greater than 5 years and it is ‘**797’.**

9. What is the impact of having a credit card on customer churn, based on the available data?

**Ans:** customers with credit card holder are more churn rate than the customers who have not.

**Credit card holders have 69.91%** churn rate while **non credit card holders have 30.09%** churn rate.

10. For customers who have exited, what is the most common number of products they had used?

**Ans:** **Product 1 and 2** are the most common number of products used by customers who had exited and also **product 1** is more used by existed customers.

11. Examine the trend of customer exits over time and identify any seasonal patterns (yearly or monthly). Prepare the data through SQL and then visualize it.

12. Analyse the relationship between the number of products and the account balance for customers who have exited.

**Ans:** there are 3 categories based on balance:

If Balance > 200000 then ‘High’

If Balance > 100000 then ‘Average’

Otherwise ‘Low’

Product 1 is more used for the maximum balance accounts which is from average balance category

for exited customers.

13. Identify any potential outliers in terms of spend among customers who have remained with the bank.

**Ans:** Any potential outliers in terms of spend among customers who have remained with the bank is

from high balance category having balance is 2,21,532.80 and Customer ID is 15571958.

14. Can you create a dashboard incorporating the visuals mentioned above and additionally derive more KPIs if possible?

**Ans:** More KPIs:

**Number of Customers = 10K** and **Churn rate =20.37%.**

15. Using SQL, write a query to find out the gender wise average income of male and female in each geography id. Also rank the gender according to the average value. (SQL)

**Ans:**

|  |  |  |  |
| --- | --- | --- | --- |
| Gender Category | Geography ID | Average Income | Rank |
| Male | 1 | 100174.25 | 1 |
| Female | 1 | 99564.25 | 3 |
| Female | 2 | 100734.11 | 2 |
| Male | 2 | 98425.69 | 3 |
| Female | 3 | 102446.42 | 1 |
| Male | 3 | 99905.03 | 2 |

16. Using SQL, write a query to find out the average tenure of the people who have exited in each age bracket (18-30, 30-50, 50+).

**Ans:**

|  |  |
| --- | --- |
| Age Bracket | Average tenure |
| 30-50 | 4.8899 |
| 18-30 | 4.7770 |
| 50+ | 4.8330 |

17. Is there any direct correlation between salary and balance of the customers? And is it different for people who have exited or not?

**Ans:** correlation between salary and balance is =0.60

It is near to 1 hence it is direct positive correlation between salary and balance

For exited customers it is 0.81 that is positively correlated and it is maximum than retain

Customers (0.54).

So, it is different for people who have exited or not.

18. Is there any correlation between salary and Credit score of customers?

**Ans:** Correlation coefficient for salary and Credit score is **1**. Hence, they are **positively correlated** with each other. That is when salary increases then credit score will also increase vice versa.

19. Rank each bucket of credit score as per the number of customers who have churned the bank.

**Ans:**

|  |  |  |
| --- | --- | --- |
| Credit Score Bucket | Churned Customers | Rank |
| Fair | 685 | 1 |
| Poor | 520 | 2 |
| Good | 452 | 3 |
| Very Good | 252 | 4 |
| Excellent | 128 | 5 |

20. According to the age buckets find the number of customers who have a credit card. Also retrieve those buckets who have lesser than average number of credit cards per bucket.

**Ans:**

|  |  |
| --- | --- |
| Age buckets | Credit cards count |
| 30-50 | 4781 |
| 18-30 | 1400 |
| 50+ | 874 |

21. Rank the Locations as per the number of people who have churned the bank and average balance of the learners.

**Ans:**

|  |  |  |
| --- | --- | --- |
| Locations | Churn count | Average Balance |
| Germany | 814 | 120361.08 |
| France | 810 | 71192.8 |
| Spain | 413 | 72513.35 |

**Data Analysis and Visualizations**

**(Subjective Questions):**

1. Customer Behaviour Analysis: What patterns can be observed in the spending habits of long-term customers compared to new customers, and what might these patterns suggest about customer loyalty?

**Ans:** long-term customers have maximum spending habits compared to new customers and also long-term customers have maximum balance than new customers. Long-term customers are more loyal than new customers.

2. Product Affinity Study: Which bank products or services are most commonly used together, and how might this influence cross-selling strategies?

**Ans:** Product 1 and 2 services are most commonly used together.

3. Geographic Market Trends: How do economic indicators in different geographic regions correlate with the number of active accounts and customer churn rates?

**Ans:** In France: Active accounts are 2591 and Churn rate is 16.15%,

Spain: Active accounts are 1312 and Churn rate is 16.37%,

Germany: Active accounts are 1248 and Churn rate is 32.44%.

4. Risk Management Assessment: Based on customer profiles, which demographic segments appear to pose the highest financial risk to the bank, and why?

**Ans:** In Germany, Bank has the highest financial risk because there is less active accounts and high churn rate compared other locations.

5. Customer Lifetime Value Forecast: How would you use the available data to model and predict the lifetime value of different customer segments?

**Ans:** I used the line chart for exited customers over month and year and applied foresting on it.

And it is showing the Churn customers will increase in the following months is between 353 to 584.

6. Marketing Campaign Effectiveness: How could you assess the impact of marketing campaigns on customer retention and acquisition within the dataset?

**Ans:** we can give offers on product 1 and 2 to assess the impact of marketing campaigns on customer retention and acquisition.

7. Customer Exit Reasons Exploration: Can you identify common characteristics or trends among customers who have exited that could explain their reasons for leaving?

**Ans:**

1) In terms of those with credit card facility, the churn rate is highest amongst **fair credit** score group 580-669.

2) Churn rate for **Female** customers **is 25.05%** and **for male is 15.37%.** So female customers are

more likely to churn.

3) customers whose **account balance** is between **1,00000 to 2,00000** are the most churned in

terms of account balance.

4) Overall, Churn rate is very high at **44.65%** for customers **above 50 years of age.**

5) churn rate is high for **product 1.**

8. Are 'Tenure', 'NumOfProducts', 'IsActiveMember', and 'EstimatedSalary' important for predicting if a customer will leave the bank?

**Ans:** yes, 'Tenure', 'NumOfProducts', 'IsActiveMember', and 'EstimatedSalary' important for predicting if a customer will leave the bank.

9. Utilize SQL queries to segment customers based on demographics, account details, and transaction behaviors.

**Ans:** SELECT

CustomerId,

NumOfProducts,

CASE

WHEN NumOfProducts = 1 THEN 'Single Product User'

WHEN NumOfProducts = 2 THEN 'Two Products User'

WHEN NumOfProducts > 2 THEN 'Multi-Products User'

ELSE 'Unknown'

END AS ProductSegment

FROM

bank churn;

10. How can we create a conditional formatting setup to visually highlight customers at risk of churn and to evaluate the impact of credit card rewards on customer retention?

**Ans:** we can change the colour of bar of max credit score and high churn customers …. for identifying customers who will get the rewards on credit cards.

11. What is the current churn rate per year and overall, as well in the bank. Can you suggest some insights to the bank about which kind of customers are more likely to churn and what are the different strategies that can be used to decrease the churn rate?

**Ans:**

overall churn rate **=20.37%.**

**Strategies:**

1) The stakeholders could consider creating products that target **seniors** close to their early retirement age to avoid losing them.

2)**An incentive program** could be considered for customers who have maintained longer relationship with the bank.

3)In the same way, an exclusive package such as travel and vacation packages, subsidized investment portfolio, etc., could be considered for the customers whose account balance is between 1,00000 to 200000, to reduce the rate at which they leave the bank.

4)The business needs to understand why there is **high churn rate for Prod 1** customers and how to get them back in business.

In Summary, **age group of above 50**, people and those with **account balance (1 lakh to 2 lakh)** are most likely to churn. The bank should consider the recommendations above and other effective strategies that can address the findings, to better customer retention and reduce churn rate.