**BANK CUSTOMERS CHURN PROJECT**

**Data Inspection and Cleaning Process**

**Data Loading**

Loaded the dataset using the pandas read\_csv() function.

**Column Names Standardization**

Standardized column names to lowercase using the columns.str.lower() method to ensure consistency and ease of access.

**Dataset Overview**

Checked the length of the dataset using the len() function to determine the number of rows.

Checked the shape of the dataset using the shape attribute to ascertain the number of rows and columns.

**Data Information**

- Printed the information about the dataset using the info() method to obtain an overview of the data types and non-null counts for each column.

- Numeric and Categorical Columns Separation:

- Separated numeric and categorical columns using the select\_dtypes() method with appropriate data type filters (include=['int','float'] for numeric and include=['O'] for categorical).

**Statistical Summary**

Generated a statistical summary of the numeric columns using the describe() method to understand the distribution and central tendency of the numerical features.

**Data Type Conversion:**

- Converted the 'age' column from float to integer data type using the astype() method to ensure consistency and eliminate decimal points.

- Converted the 'id' column from integer to object data type using the astype() method to treat it as a categorical variable rather than a numerical identifier.

- Target Variable Transformation:

- Replaced numerical values in the 'exited' column with categorical labels ('churned' and 'Not Churned') using the replace() method for better interpretability.

**Data Quality Check**

- Conducted a value count of the 'exited' column to inspect the distribution of churned and not churned customers to ensure data quality and understand class imbalance.

**Visualization**

- Visualized the value count of churned and not churned customers using a horizontal bar chart with the plot() method to provide a clear understanding of the distribution.

**Exploratory Analysis of Churned Customers**

This report provides a comprehensive analysis of customers who have churned from the service, considering demographic, financial, geographical, and activity-related factors. The aim is to identify significant characteristics and behaviors of churned users and provide recommendations to improve user retention.

**Demographics**

- Age Distribution: Churned users are predominantly between the ages of 40 to 46, with 46 being the most common age.

- Gender Distribution: Analysis reveals varying churn rates between genders. Among churned users, 20,105 are female, while 14,816 are male.

- Tenure: Users with tenures of 3 to 5 years exhibit higher churn rates, particularly at the 4-year mark.

**Financial Information**

- Balance: A significant proportion of churned users maintain a balance of 0, indicating low engagement or activity.

- Credit Score: Credit scores among churned users range from 637 to 850, with 678 and 850 being the most frequent.

**Product Usage**

- Number of Products: Churned users primarily utilize a single product, with a smaller segment utilizing two or three products.

**Activity Status**

- Active vs. Inactive Users: Churned users comprise both active and inactive members. Active users represent 10,297 while inactive users represent 24,624.

**Geographical Analysis:**

-Location: Churn rates vary across regions, indicating regional factors influencing customer behavior and retention. In France 15572 churned, in Germany 13114 churned and in Spain 6235 users churned.

**Recommendations to Retain Users**

1. Localized Marketing Campaigns:

Develop region-specific marketing strategies tailored to address unique needs identified through geographical analysis.

Utilize localized events or cultural insights to create targeted campaigns aimed at retaining users in high-churn regions.

2. Personalized Engagement:

Implement personalized incentives or loyalty rewards based on demographic, financial, and activity-related characteristics to encourage user retention.

Offer tailored financial management tools or advisory services to users with low balances or credit scores to enhance engagement with the service.

3. Product Optimization:

Analyze usage patterns of users with multiple products and customize offerings to better meet their needs and preferences.

Conduct user surveys to gather feedback and identify areas for product improvement or feature development.

4. Community Engagement Initiatives:

Foster a sense of community among users through localized events, forums, or online communities, particularly in regions with high churn rates.

Encourage user participation and feedback to better understand regional challenges and adapt retention strategies accordingly.

5. Continuous Monitoring and Adaptation:

Regularly monitor churn metrics and conduct ongoing analysis to identify changing trends or patterns.

Maintain open communication channels with users to address concerns promptly and demonstrate a commitment to customer satisfaction.

6. Localized Customer Support:

Establish dedicated customer support teams or resources for users in high-churn regions to provide personalized assistance and address issues effectively.