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Credit Card Users Churn Prediction : Problem Statement

Submission type	:	File Upload
Due Date	:	Dec 11, 8:30 AM
Total Score	:	40
Available from	:	Nov 17, 8:30 PM

Description

Background & Context

The Thera bank recently saw a steep decline in the number of users of their credit card, credit cards are a good source of income for banks because of different kinds of fees charged by the banks like annual fees, balance transfer fees, and cash advance fees, late payment fees, foreign transaction fees, and others. Some fees are charged to every user irrespective of usage, while others are charged under specified circumstances.

Customers' leaving credit cards services would lead bank to loss, so the bank wants to analyze the data of customers and identify the customers who will leave their credit card services and reason for same – so that bank could improve upon those areas

You as a Data scientist at Thera bank need to come up with a classification model that will help the bank improve its services so that customers do not renounce their credit cards

You need to identify the best possible model that will give the required performance

Objective

1. Explore and visualize the dataset.
2. Build a classification model to predict if the customer is going to churn or not
3. Optimize the model using appropriate techniques
4. Generate a set of insights and recommendations that will help the bank

Data Dictionary:

- CLIENTNUM: Client number. Unique identifier for the customer holding the account
- Attrition_Flag: Internal event (customer activity) variable - if the account is closed then "Attrited Customer" else "Existing Customer"
- Customer_Age: Age in Years
- Gender: Gender of the account holder
- Dependent_count: Number of dependents
- Education_Level: Educational Qualification of the account holder - Graduate, High School, Unknown, Uneducated, College(refers to a college student), Post-Graduate, Doctorate.
- Marital_Status: Marital Status of the account holder
- Income_Category: Annual Income Category of the account holder
- Card_Category: Type of Card
- Months_on_book: Period of relationship with the bank
- Total_Relationship_Count: Total no. of products held by the customer
- Months_Inactive_12_mon: No. of months inactive in the last 12 months
- Contacts_Count_12_mon: No. of Contacts between the customer and bank in the last 12 months
- Credit_Limit: Credit Limit on the Credit Card
- Total_Revolving_Bal: The balance that carries over from one month to the next is the revolving balance
- Avg_Open_To_Buy: Open to Buy refers to the amount left on the credit card to use (Average of last 12 months)
- Total_Trans_Amt: Total Transaction Amount (Last 12 months)
- Total_Trans_Ct: Total Transaction Count (Last 12 months)
- Total_Ct_Chng_Q4_Q1: Ratio of the total transaction count in 4th quarter and the total transaction count in 1st quarter

- Total_Amt_Chng_Q4_Q1: Ratio of the total transaction amount in 4th quarter and the total transaction amount in 1st quarter
- Avg_Utilization_Ratio: Represents how much of the available credit the customer spent

Best Practices for Notebook :

- The notebook should be well-documented, with inline comments explaining the functionality of code and markdown cells containing comments on the observations and insights.
- The notebook should be run from start to finish sequentially before submission.
- It is preferable to remove all warnings and errors before submission.

Submission Guidelines :

1. The submission should be: well commented Jupyter notebook [format - .HTML] - Please run the notebook sequentially before submitting.
2. Any assignment found copied/ plagiarized with other groups will not be graded and awarded zero marks
3. Please ensure timely submission as any submission post-deadline will not be accepted for evaluation
4. Submission will not be evaluated if,
 1. it is submitted post-deadline, or,
 2. more than 1 files are submitted

Happy Learning!!

Scoring guide (Rubric) - Credit card Users Churn Prediction



Criteria

Points

Criteria	Points
Exploratory Data Analysis and Insights - Problem definition, questions to be answered - Data background and contents - Univariate analysis - Bivariate analysis - Key meaningful observations on individual variables and the relationship between variables	5
Data pre-processing - Prepare the data for analysis - Feature Engineering - Missing value Treatment - Outlier Treatment Note: Please ensure no data leakage occurs among train-test and validation sets	3
Model building - Choose metric on interest - Build 6 models (from logistic regression, decision trees, bagging and boosting methods) Note: You can choose not to build XGBoost if you are facing issues with the installation	3
Model building - Oversampled data Build 6 models using oversampled data (from logistic regression, decision trees, bagging and boosting methods) - You can choose not to build XGBoost if you are facing issues with the installation	4
Model building - Undersampled data Build 6 models using undersampled data(from logistic regression, decision trees, bagging and boosting methods) - You can choose not to build XGBoost if you are facing issues with installation	4

Criteria	Points
Choose to tune 3 models - Choose models that might perform better after tuning (tune at least 3 models out of 18 built in the previous steps) - Provide proper reasoning for tuning that model	2
Hyperparameter tuning using random search - Tune the best 3 models obtained above using randomized search and metric of interest - Check the performance of 3 tuned models	5
Model Performances - Compare the model performance of tuned models - Choose the best model	4
Productionize the model - Create a final model using pipelines	3
Actionable Insights & Recommendations - Business recommendations and insights	3
Notebook - Overall quality - Structure and flow - Well commented code	4
	Points 40

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