

Artwork/Project Title

Predicting Customer Churn

Year Accomplished

2023

Role/Position  
Data Scientist

Publication Link

<https://github.com/belindamutiara>

Project 4 of 20

### Artwork/Project Description

For the final project in machine learning course, I led a team in building and comparing four machine learning models (Logistic Regression, GNB, Random Forest, and LGBM) to predict whether a customer categorize as churn or not. We achieved the highest accuracy of 86% using the LGBM model. At this project We conducted data exploration, data preprocessing, data mining, and modelling using Python language. We found three main factors that affect customer churn, they are age, credit score, and balance.

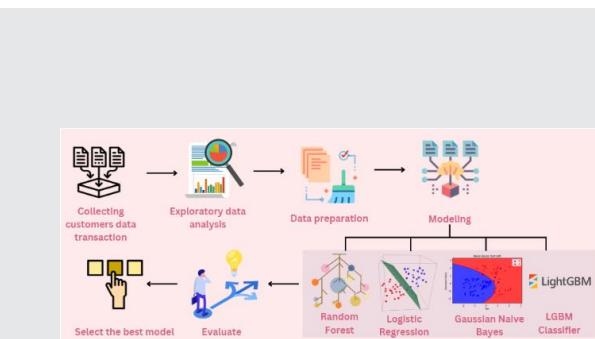


Figure 1 Methodology



Figure 2 Data Visualization for categorical data type

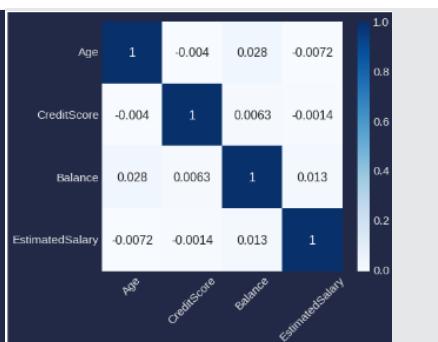


Figure 3 Correlation matrix

```
### Get performance metrics
lgbm_score = metrics.accuracy_score(y_test, lgbm_pred) * 100

### Print classification report
print("Classification report for %s:\n%s\n" % (lgbm, metrics.classification_report(y_test, lgbm_pred)))
print("Accuracy score:", lgbm_score)

Classification report for LGBMClassifier():
precision    recall   f1-score   support
          0       0.91      0.92      0.91     1607
          1       0.65      0.62      0.63     393

accuracy                           0.86    2000
macro avg       0.78      0.77      0.77    2000
weighted avg    0.86      0.86      0.86    2000

Accuracy score: 86.0
```

Figure 4 Model Building

	Accuracy Score	Recall Score	Precision Score
Logistic Regression	72.50000	72.50000	81.120194
Gaussian Naive Bayes	73.75000	73.75000	81.024120
Random Forest	83.10000	83.10000	84.185744
LGBM Classifier	86.00000	86.00000	85.743669

Figure 5 Metrics evaluation



Figure 6 Visualization of metrics evaluation

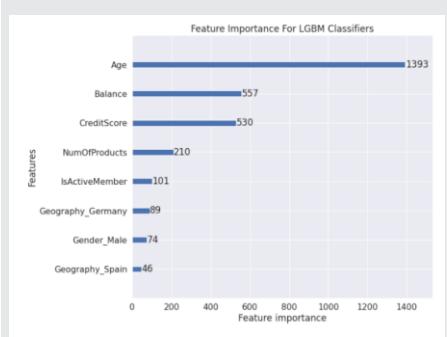


Figure 7 Feature Importance

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Portfolio Submission for

**BINUS Internship Track  
2024**