

Artwork/Project Title

Predicting Customer Churn

Year Accomplished

2023

Role/Position

Data Scientist

Publication Link

<https://github.com/belindamutiara/Portfolio>

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.

Project 4 of 20

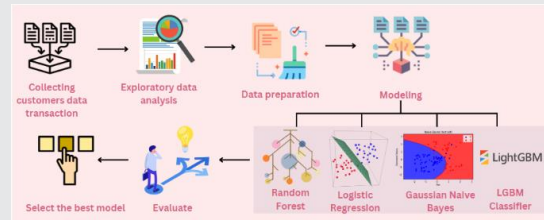


Figure 1 Methodology



Figure 2 Data Visualization for categorical data type

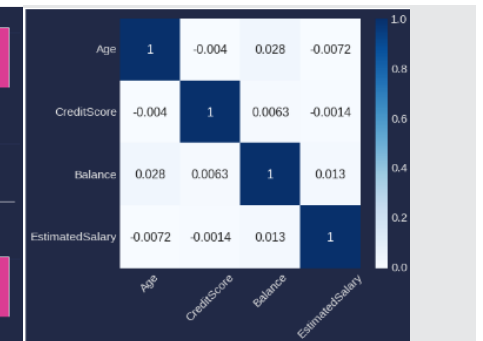


Figure 3 Correlation matrix

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

### Print classification report
print("Classification report for {}:\n".format(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     1687
     1       0.65     0.62     0.63       393

 accuracy          0.86
 macro avg         0.78     0.77     0.77     2080
weighted avg         0.86     0.86     0.86     2080

Accuracy score: 86.0
```

Figure 4 Model Building

| | Accuracy Score | Recall Score | Precision Score |
|----------------------|----------------|--------------|-----------------|
| Logistic Regression | 72.500000 | 72.500000 | 81.120194 |
| Gaussian Naive Bayes | 73.750000 | 73.750000 | 81.024120 |
| Random Forest | 83.100000 | 83.100000 | 84.185744 |
| LGBM Classifier | 86.000000 | 86.000000 | 85.743669 |

Figure 5 Metrics evaluation



Figure 6 Visualization of metrics evaluation

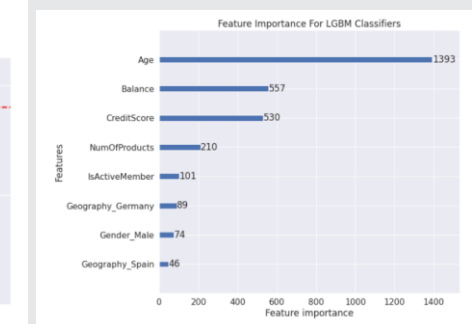


Figure 7 Feature Importance

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Portfolio Submission for

**BINUS Internship Track
2024**