# Deliverable 17 Written Analysis

# Overview of the analysis:

The purpose of this analysis is to apply data preparation, statistical reasoning and machine learning (ML) algorithms to solve a real-world challenge like credit card risk. Credit card risk can be classified as a good loan or a risky loan which is appropriate training, building and evaluating imbalanced-learn and scikit-learn libraries using resampling. The dataset from LendingClub will be oversampled using RandomOverSampler and SMOTE algorithm. As well as combinatorial approach of over- and undersampling using the SMOTEEN algorithm. Finally compare two new ML models to reduce bias leveraging BalancedRandomForestClassifier and EasyEnsembleClassifier algorithms to predict credit risk.

# Results:

\* RandomOverSampler – Oversampling

\* Accuracy: 66.0%

\*![ RandomOverSample]( <https://github.com/mfGWU/Credit_Risk_Analysis/blob/main/img/RandomOverSampler.PNG> "RandomOverSample")

\* SMOTE – Oversampling

\* Accuracy: 65%

\*![ SMOTE]( <https://github.com/mfGWU/Credit_Risk_Analysis/blob/main/img/SMOTE.PNG> "SMOTE ")

\* ClusterCentroids – ClusterCentroids

\* Accuracy: 65%

\*![ ClusterCentroids]( <https://github.com/mfGWU/Credit_Risk_Analysis/blob/main/img/ClusterCentroids.PNG> " ClusterCentroids ")

\* SMOTEENN - Combination (Over and Under)

\* Accuracy: 53%

\*![ SMOTEENN]( <https://github.com/mfGWU/Credit_Risk_Analysis/blob/main/img/SMOTEENN.PNG> " SMOTEENN ")

\* RandomForestClassifier - Balanced Random Forest Classifier

\* Accuracy: 99.6%

\*![ RandomForestClassifier]( <https://github.com/mfGWU/Credit_Risk_Analysis/blob/main/img/RandomForestClassifier.PNG> " RandomForestClassifier ")

\* AdaBoostClassifier - Easy Ensemble AdaBoost Classifier

\* Accuracy: 99.6%

\* ![ AdaBoostClassifier]( <https://github.com/mfGWU/Credit_Risk_Analysis/blob/main/img/AdaBoostClassifier.PNG> " AdaBoostClassifier ")

# Summary:

Summarize the results of the machine learning models, and include a recommendation on the model to use, if any. If you do not recommend any of the models, justify your reasoning.