**Predicting credit charge-offs: A machine learning approach for risk assessment**

Wimalarathne W.T.N.G1, Imasha G.G.P2, Perera W.A.D.R.U3

1 Faculty of IT, University of Moratuwa, Bandaranayake Mawatha, Moratuwa, 10400, naduniwimalarathna21@gmail.com \*

2 Faculty of IT, University of Moratuwa, Bandaranayake Mawatha, Moratuwa, 10400, piyumiimasha9@gmail.com

3 Faculty of IT, University of Moratuwa, Bandaranayake Mawatha, Moratuwa, 10400, roomaupenya02@gmail.com

[\* Corresponding Author: Wimalarathne W.T.N.G1]

This study employs machine learning techniques to predict credit charge-offs while addressing the challenges of class imbalance. A thorough exploratory data analysis identified key predictors such as FICO scores, delinquency status, and unusual submission patterns. Correlation analysis revealed significant relationships among features, and feature selection via Chi-Square tests emphasized categorical predictors. Logistic regression with balanced class weights emerged as the top-performing model, achieving an accuracy of 86%. The model’s coefficients provided interpretability, while generated risk scores offered practical applicability. This analysis demonstrates the integration of statistical insights and predictive modeling to support data-driven decision-making in credit risk assessment.

**Keywords:** machine learning, credit risk, logistic regression, class imbalance, feature selection