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ANALYZING CREDIT RISK ASSESSMENT USING PREDICTIVE ANALYTICS: IMPLICATIONS IN AN ERA OF ECONOMIC UNCERTAINTY

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Date of Submission: September 24, 2023

Abstract

In the current financial landscape, characterized by a confluence of economic challenges, including soaring inflation, escalating job losses, elevated interest rates, global uncertainties, and record-high levels of debt, encompassing student loans, mortgages, and line of credit, the topic of credit risk assessment has assumed unprecedented importance in the realm of financial governance, especially in the banking industry. In fact, credit risk assessment plays a pivotal role in financial institutions, influencing lending decisions and overall financial stability. Therefore, this capstone research project seeks to make a substantive contribution to this discourse by delving into the application of predictive analytics, with a specific focus on credit risk assessment.

The dataset selected for this research endeavor, drawn from Kaggle's "Credit Risk Dataset" provides a rich and extensive resource to explore and address the intricate challenges inherent in contemporary credit risk management. To access this dataset in its entirety, please follow this link: https://www.kaggle.com/datasets/laotse/credit-risk-dataset?resource=download

Given the compelling context, three interrelated research questions have been meticulously crafted to delve into the nuances of credit risk assessment:

- **Research question 1:** What are the pivotal determinants of credit risk within the dataset, and to what extent do these factors contribute to the development of a robust credit risk assessment model? An exploration of variables such as age, annual income, home ownership status, employment length, loan intent, loan grade, loan amount, interest rate, historical loan status, and credit history length will be undertaken.

- **Research question 2:** How can we identify key patterns and relationships within the credit risk data that offer insights into the development of effective credit risk management strategies, particularly in the context of the prevailing economic volatility? This inquiry will involve a comprehensive analysis of the dataset to uncover significant correlations, dependencies, and risk factors influencing credit outcomes.
- **Research question 3:** The decision tree algorithm will be used amongst others, how can it be effectively harnessed to uncover pivotal patterns and relationships within credit risk data, offering valuable insights for the development of robust credit risk management strategies, especially within the context of the ongoing financial turbulence? This exploration entails a thorough analysis of the dataset to reveal substantial correlations, dependencies, and influential factors shaping credit outcomes.

This research project will employ an array of predictive analytics techniques, encompassing pattern mining and causality assessment, to thoroughly investigate and address the posed research questions. The methodology will involve meticulous data preprocessing, judicious feature selection, and the development of predictive models that are finely attuned to the multifaceted challenges associated with contemporary credit risk assessment.

In this project, Python will be used along with essential packages like Pandas for data manipulation, Scikit-Learn for machine learning and modeling, NumPy for numerical operations, and Jupyter Notebooks for interactive analysis. This combination equips us to efficiently preprocess, analyze, model, and visualize credit risk data. All of this will be conducted within the overarching backdrop of the complex and volatile economic environment, which further underscores the relevance and urgency of this research in the field of financial governance.

References

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