MCSD1043: RESEARCH DESIGN AND ANALYSIS IN DATA SCIENCE

ASSIGNMENT 2 : SYNOPSIS

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PROJECT TITLE : Fraud Detection in Banking Data by Machine Learning Techniques

The main problem at hand is the widespread problem of credit card fraud in the banking industry. The disparity between authentic and fraudulent credit card operations is a significant challenge to efficient identification in the financial transactions domain. This problem statement emphasizes how urgently we need an advanced and precise fraud detection system that can work its way through the complex imbalanced datasets that are common in banking data.

The suggested solution applies modern techniques, such as the deliberate application of Bayesian optimization and boosting algorithms. Metrics like accuracy, precision, recall, F1-score, and the ROC-AUC curve are used to measure and compare the performance of different algorithms through a rigorous evaluation procedure. With a focus on the particular complexities of credit card fraud detection, the domain knowledge sits at the nexus of finance, data science, and machine learning.

This project should produce a strong framework for detecting fraud that works better than current techniques. The objective is to significantly increase the detection of fraudulent transactions by utilizing the advantages of machine learning methods, such as LightGBM, XGBoost, and deep learning models. The suggested method seeks to minimize false positives while guaranteeing accurate identification of fraudulent activity by striking a compromise between recall and precision.

In conclusion, the issue at hand is that current techniques for detecting credit card fraud are inadequate for managing unbalanced datasets in the banking industry. By using complex evaluation metrics, advanced machine learning algorithms, and a domain-specific focus, the suggested solution creates a fraud detection framework that greatly improves the efficiency and accuracy of detecting fraudulent credit card transactions.