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## Machine Learning Algorithms for Forecasting and Categorizing Euro to-Dollar Exchange Rates

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Abstract: Forecasting and categorizing exchange rates is a critical task in financial markets, impacting both investment strategies and economic planning. This study explores various machine learning algorithms for predicting and classifying Euro-to-Dollar exchange rates, focusing on existing models such as AdaBoost, Gradient Boosting, Bagging, Extreme Gradient Boosting (XGBoost) Classifier, and Decision Tree Classifier. These algorithms are evaluated for their performance in handling the complexities of exchange rate movements. In addition to analyzing traditional methods, This study proposes a novel approach by combining three advanced machine learning models: Logistic Regression, Random Forest Classifier, and Gaussian Naive Bayes. This ensemble model aims to leverage the strengths of each algorithm, potentially improving prediction accuracy and classification precision. By integrating these models, it seek to enhance the robustness and reliability of exchange rate forecasts, providing a more comprehensive tool for financial analysts and decision-makers. The results of this comparative study offer insights into the efficacy of various machine learning techniques and their application to currency exchange rate forecasting., Machine Learning, Special Time Slice (STS), Process Classification, Ensemble Learning, XGBoost, Random Forest, Stacking Classifier, SMOTE, Resthisce Allocation, Throughput, Latency, Cloud Computing, Edge Computing, High-Performance Computing

Keywords: Machine Learning, Exchange Rate Forecasting, Currency Classification, EUR/USD Prediction, Time Series Analysis..

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