Model Performance Report – Financial Analytics & Fraud Detection

1. Executive Summary

- Stock Forecasting: MAPE 3.8%, RMSE 2.47
- Fraud Detection (Random Forest): Accuracy 96.4%, Recall 94.1%, AUC 0.982

2. Forecasting Models

- Prophet model with daily frequency and yearly/weekly seasonality.
- ARIMA(1,1,1) baseline for comparison.
- Evaluation performed on 30-day holdout window.

3. Fraud Detection Models

- Logistic Regression and Random Forest classifiers.
- SMOTE used to rebalance minority fraud class.
- Metrics reported on a stratified test split.

4. Key Takeaways

- Forecasts are accurate enough for tactical planning and dashboards.
- Fraud model recalls most fraudulent cases while maintaining high precision.
- Feature importance analysis highlights amount, time-of-day, and geography as key drivers of risk.