VLG OPEN PROJECT

Problem Statement :
 Predicting the Indian Rupee vs USD and Euro vs USD Exchange rate using Time Series
Forecasting models .

DATASETS:
1. For-ex Rates of IND Rupee vs USD from kaggle (link provided in datasets)
2. For-ex Rates of EURO vs USD from kaggle (link provided in datasets)

APPROACH :
Collecting Data of previous USD Vs Indian Rupee & Euro vs USD Exchange Rate,
preprocessing the data, developing several models one at a time and plotting curves and
evaluating their metrics. The performances of several models will be evaluated to identify the
best one.

In this Time Series Forecasting project for predicting foreign exchange rates, the approach
involves the following models:
1. ARIMA Model
2.GARCH(Generalized Auto-Regressive Conditional Heteroskedasticity) Model.
3. Sequential Model - LSTM(Long Short-Term Memory)

ARIMA MODEL : The ARIMA (Autoregressive Integrated Moving Average) model is a time
series forecasting method combining autoregression, differencing, and moving averages. It
predicts future values based on past observations, making it valuable for analyzing and
forecasting trends in data with a temporal structure, such as economic or financial time series .

GARCH MODEL : The GARCH (Generalized Autoregressive Conditional Heteroskedasticity)
model is a statistical tool used in financial econometrics to analyze and forecast volatility in time
series data. It captures the time-varying volatility by modeling the conditional variance, allowing
for better risk assessment in financial markets.

The Long Short-Term Memory (LSTM) model : is a type of recurrent neural network (RNN)
designed for processing and predicting sequential data. LSTMs excel in capturing and learning
long-range dependencies, making them effective for tasks like natural language processing,
speech recognition, and time series analysis.

RESULTS :
The results of the several models are accessed in terms of MSE and MAE values :
1. ARIMA MODEL :
    MSE : 0.21542380532234595
    MAE : 0.40727181229826626

2. LSTM MODEL :
   MSE : 5.704651457301518e-06
   MAE : 0.001864092121784653

REFERENCES :

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