Time-series-analysis-using-LSTM

This repository focuses on LSTM models and technical indicators like RSI, MACD, Bollinger Bands, and ROC. It includes data preprocessing, EDA, hyperparameter tuning, and stock price prediction to enhance investment strategies.

Evaluation Metric

A number and a number of symbols

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Feature Selection

Uses Random Forest importance scores:

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**Features**

1. Data Collection: Downloads historical stock data for portfolio tickers using Yahoo Finance.

2. Technical Indicator Calculation: Includes RSI, MACD, Bollinger Bands, and ROC for detailed analysis.

3. Exploratory Data Analysis (EDA): Performs statistical analysis and detects outliers.

4. Preprocessing: Handles missing values, outliers, and scales data for model input.

5. LSTM Model Implementation: Builds and trains LSTM models with hyperparameter tuning.

6. Hyperparameter Optimization: Utilizes Bayesian Optimization for optimal model configuration.

7. Performance Metrics: Calculates MAPE (Mean Absolute Percentage Error) for model evaluation.

8. Visualization: Generates plots comparing actual vs predicted stock prices.

**Dependencies**

This project uses the following libraries:

1. pandas - For data manipulation
2. numpy - For numerical computations
3. matplotlib & seaborn - For visualization
4. yfinance - For downloading stock data
5. tensorflow & keras\_tuner - For building and optimizing LSTM models
6. scipy & statsmodels - For statistical analysis
7. sklearn - For preprocessing and feature selection

**Visualization**

A graph showing the price of a stock market

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AI-generated content may be incorrect.A graph showing the price of a stock market

AI-generated content may be incorrect. A graph showing the growth of a stock market

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