



Bitcoin Trading
Data Analysis

CryptoForecast:
LSTM Insights

Scope of the Project

What can machine learning do to improve Bitcoin exchange rate forecasts to create more effective trading strategies?

The project scope involved developing a robust machine learning tool incorporating advanced data analytics to forecast BTCUSD exchange rates, enhancing market predictions and facilitating effective trading strategies.

Project Description

1. Data Collection : From Yahoo Finance.
2. Data Preprocessing : Scaling the data, Spilt the Data
3. Model Development : Utilizing Sequential LSTM Model
4. Model Evaluation & Optimization
5. Visualization & Presentation
6. Documentation & Code Structuring
7. Project Delivery and Future Work

Research Questions to Answer

1

How does a machine learning tool enhance accurate market predictions, considering our innovative approach to forecasting Bitcoin prices using LSTM?

2

How does integrating statistical and trend analysis into our machine learning tool enhance its effectiveness in the dynamic cryptocurrency trading domain?

3

What considerations should be considered to trust a model, particularly regarding R-squared, MSE, and other metrics?

4

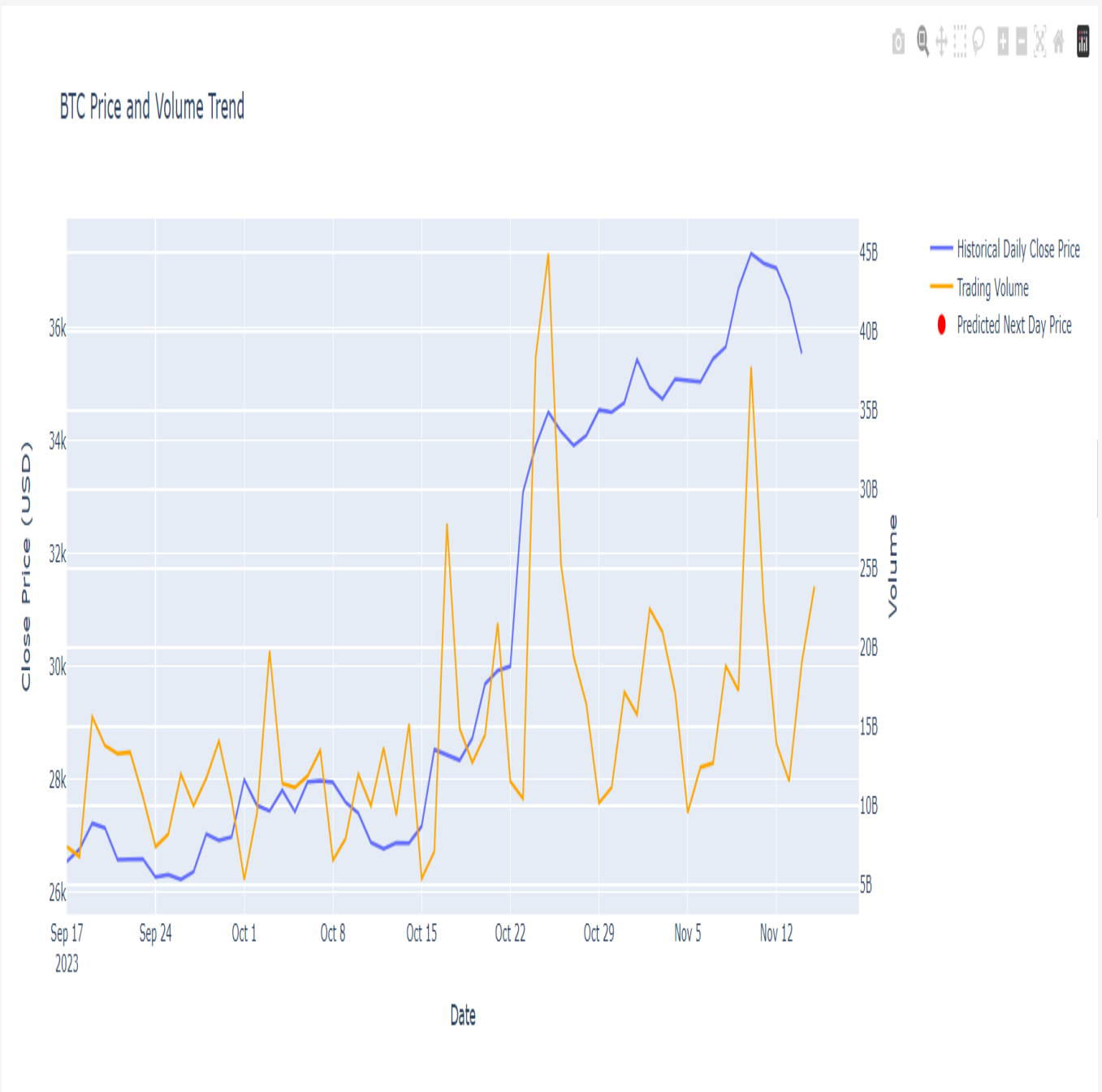
Dataset Selection

- **Source:** Bitcoin historical data from Yahoo Finance.
- **Timeframe:** January 1,2022 to November 15,2023.
- **Features :** Open, High, Low, Close and Volume Prices of Bitcoin.

Training the Model

- Efficient learning with Early Stopping and ReduceLROnPlateau
- Preventing overfitting and fine-tuning for efficiency
- Optimizing parameters with Timeseries Split and GridSearch CV

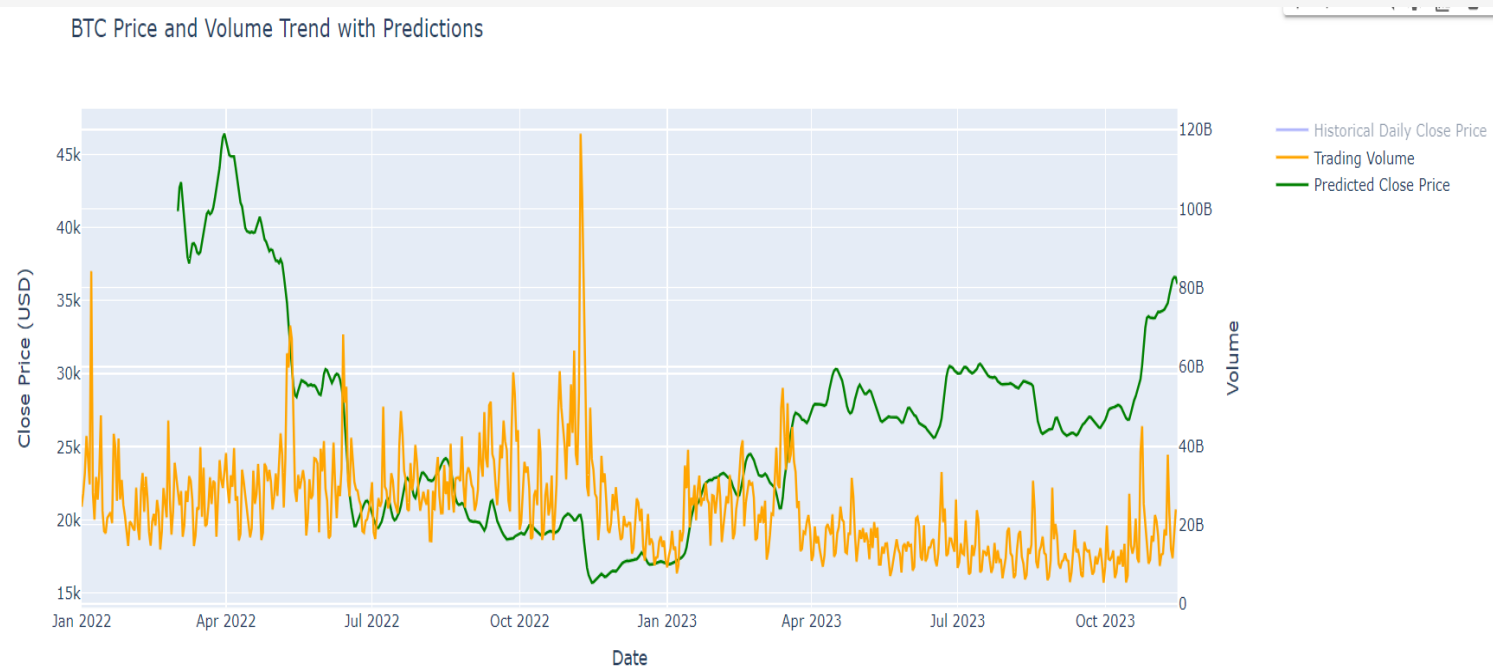
Analysis on BTC Price and Volume Trend



Analysis on BTC Price and Volume Trend with Predictions

Picture 1 shows Trading Volume with Predicted Close Price

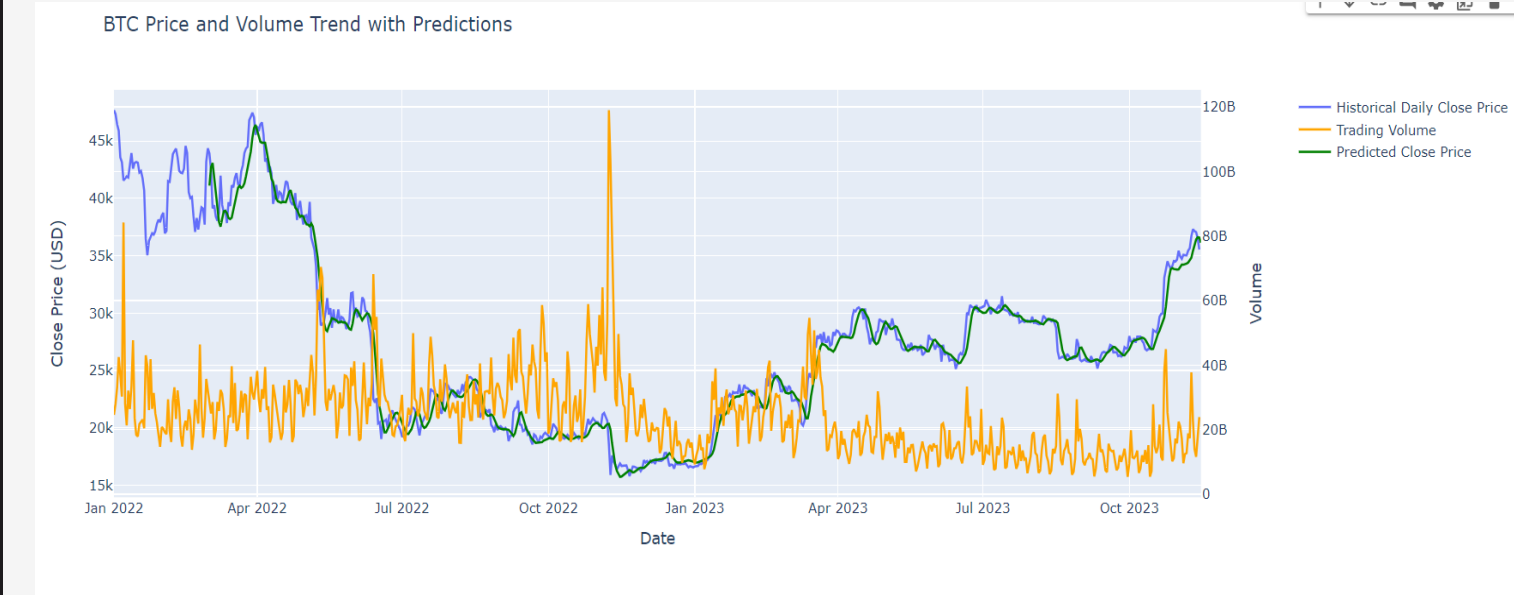
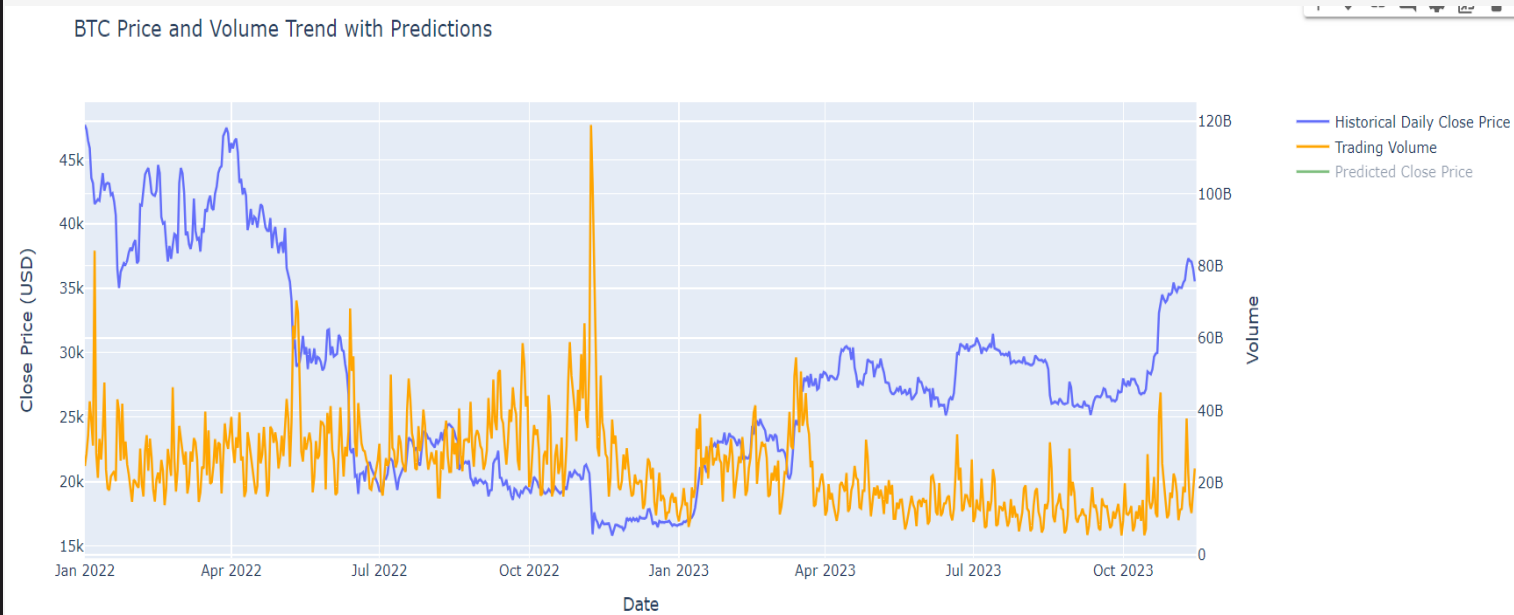
Picture 2 shows Historical Daily Close price with Predicted Close Price



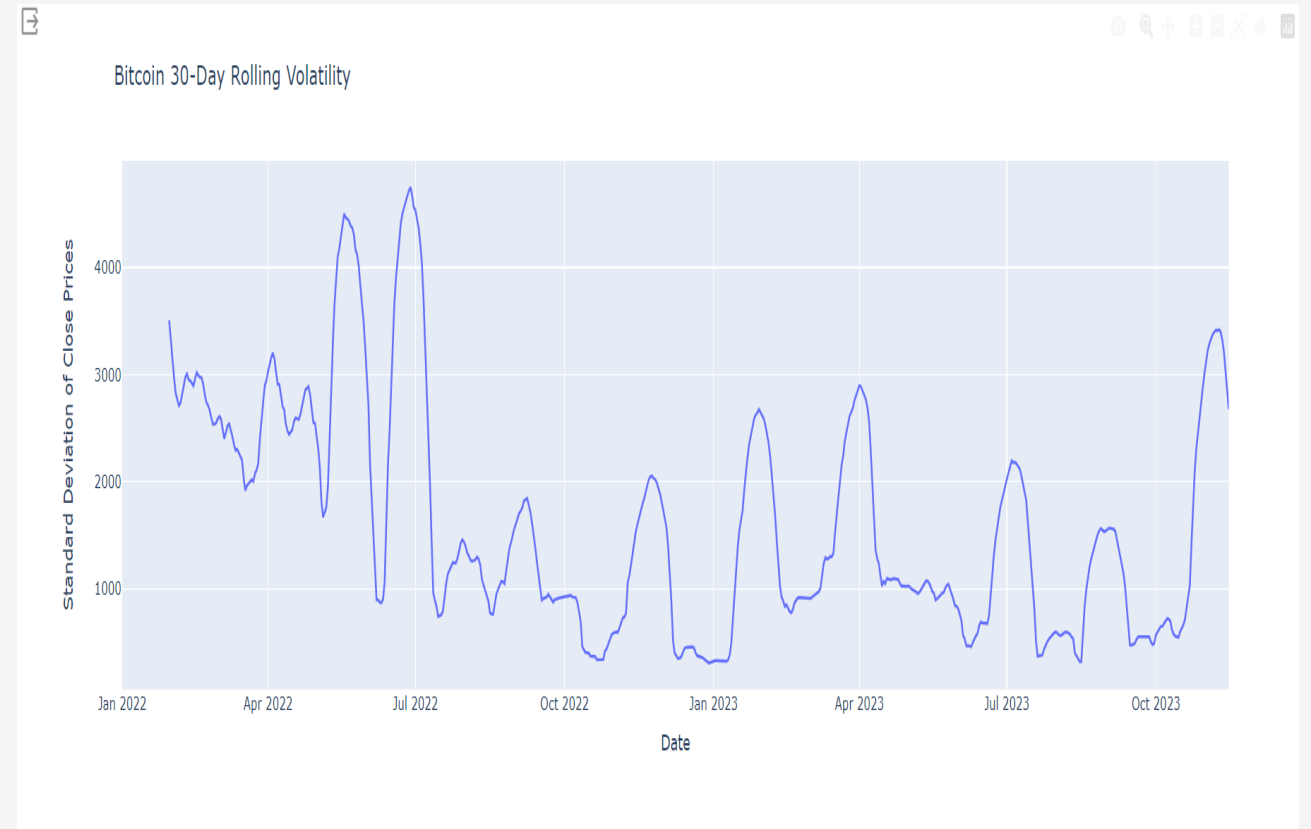
Analysis on BTC Price and Volume Trend with Predictions

Picture 1 shows Historical Daily Close Price with Trading Volume

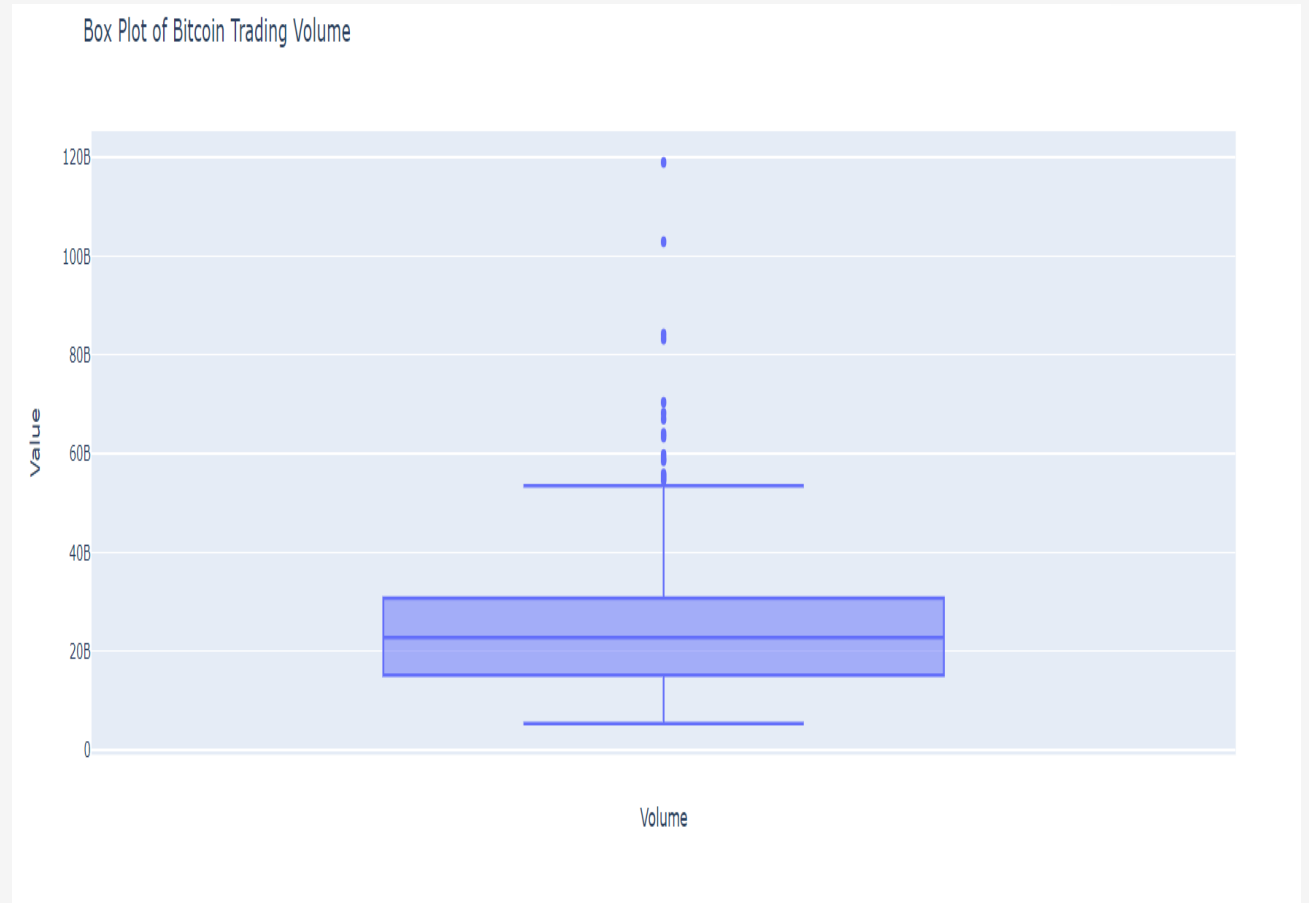
Picture 2 shows BTC Price and Volume Trend with Predictions



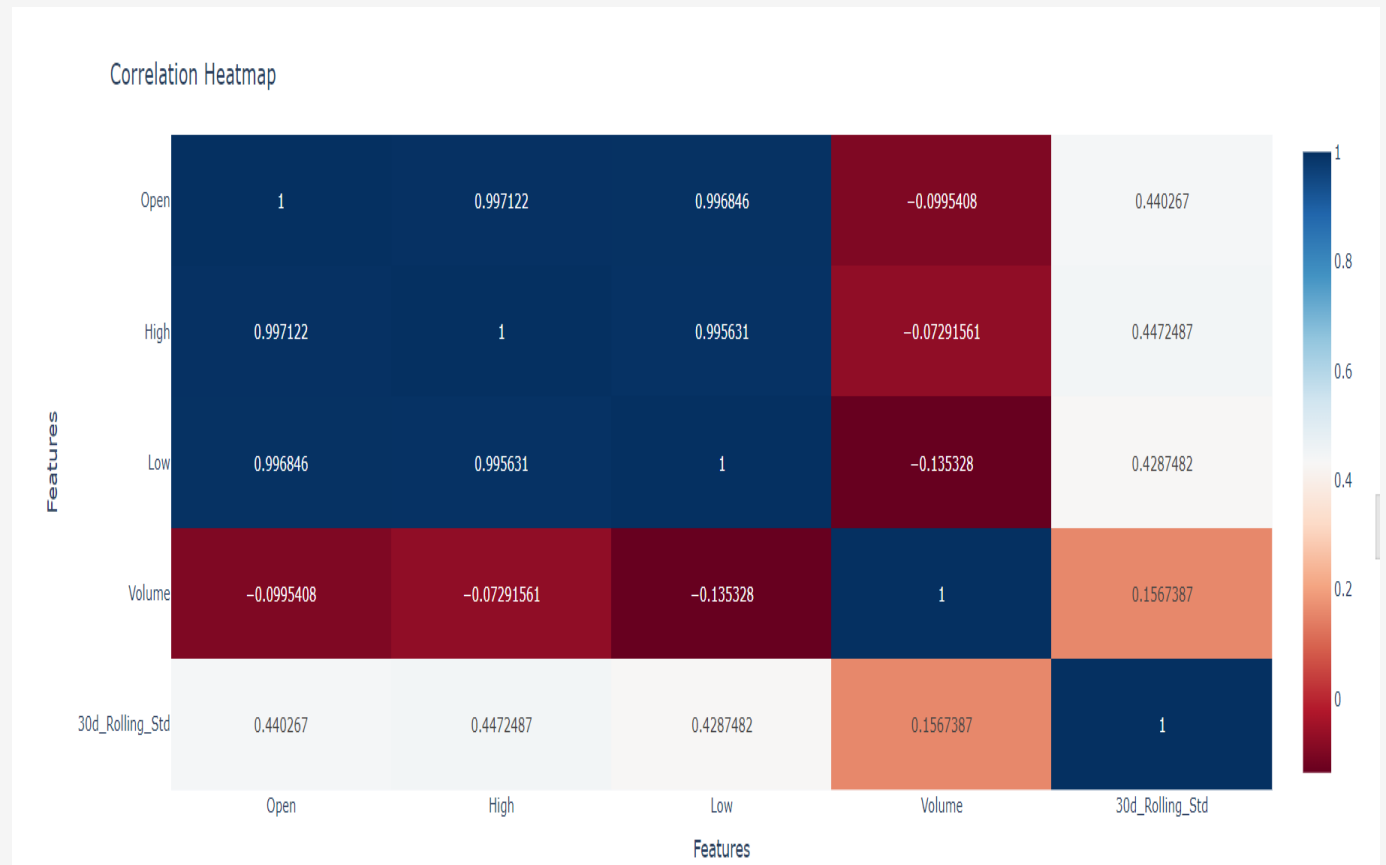
Analysis on Bitcoin 30-Day Rolling Volatility



Analysis on Bitcoin Trading Volume



Analysis on Correlation Heatmap



Future developments, recommendations & summary

1

Explore diverse models (RandomForest, etc) for future market adaptability and more granular precision in prediction.

2

Evaluate the effectiveness of trading strategies using methods like the Simple Moving Average (SMA) to translate predictions into actionable insights

3

LSTM proved to be quite valuable in predicting BTCUSD trends.