Modeling Ethereum Prices

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Goal and Business Understanding

Ethereum:

- A decentralized, open-source blockchain with smart contract functionality
- Launched in 2015
- Highly volatile, making traditional forecasting methods difficult to implement

Business Goal and Audience:

- Investment firms/retail traders interested in day trading
- Model that helps make day trade decisions through accurate forecasting

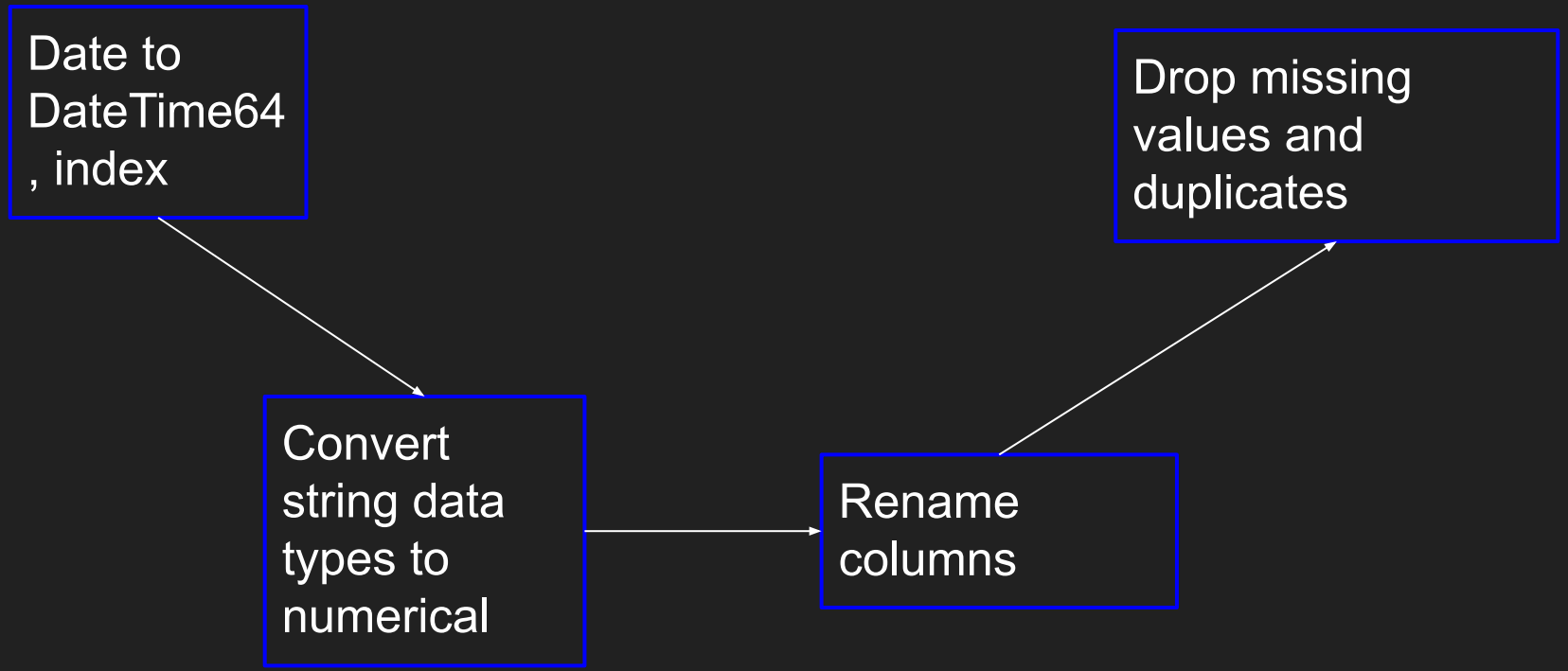
Data Source and Features

The data was webscraped using Octoparse from CoinMarketCap.com.

The data includes the following features:

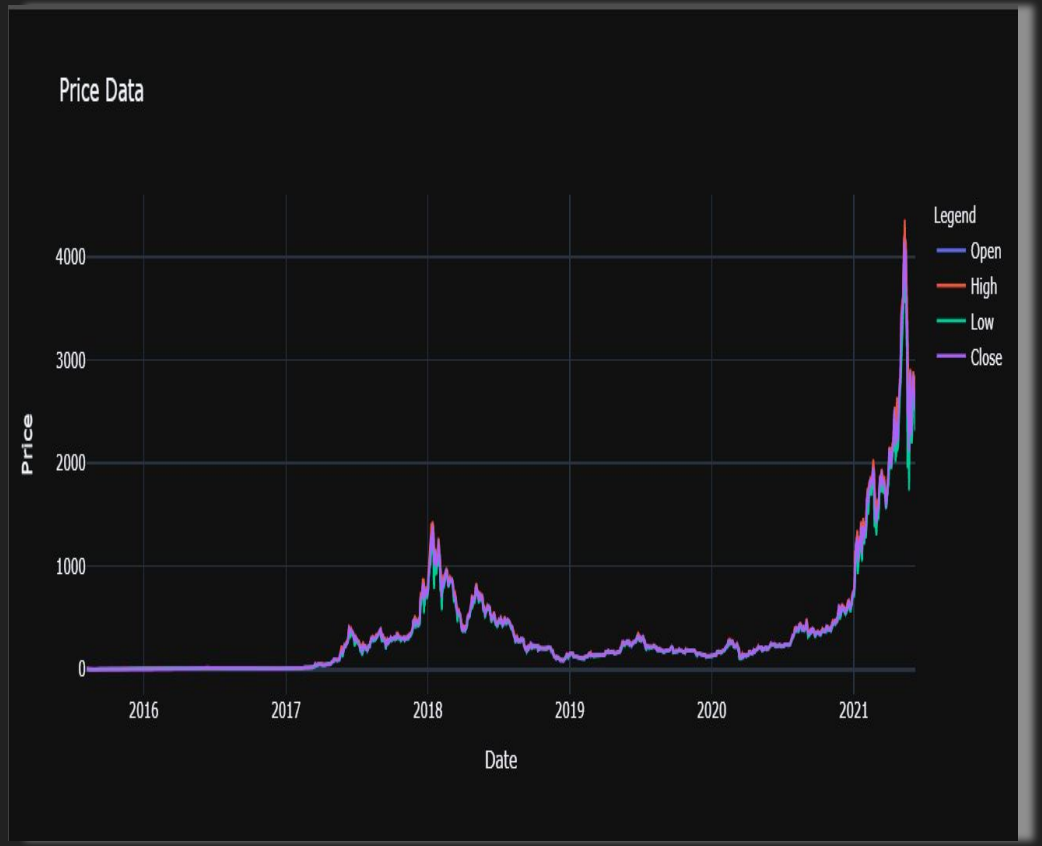
1. Open
2. High
3. Low
4. Close
5. Volume
6. Market Cap

Data Preprocessing



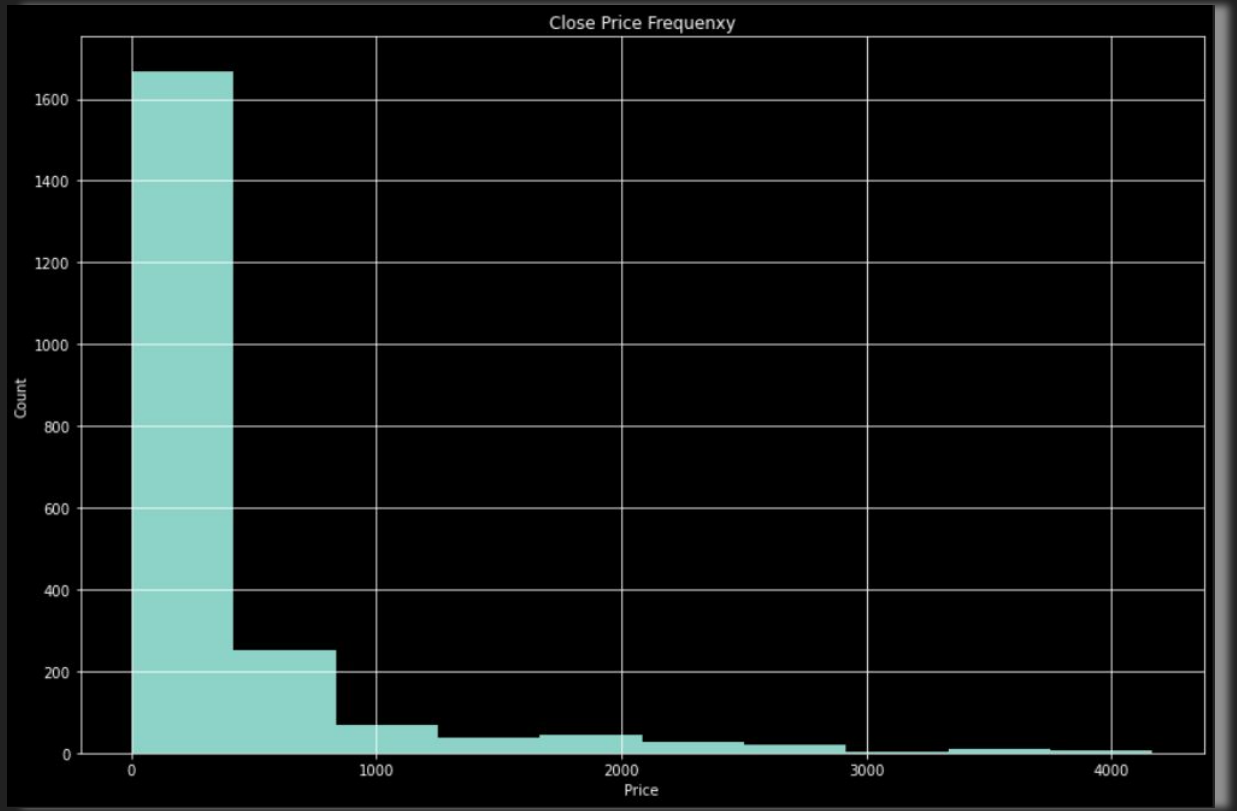
Price Movement

- Highly volatile
- 2018 experienced a dramatic rise and fall in price
- 2021 experienced the same



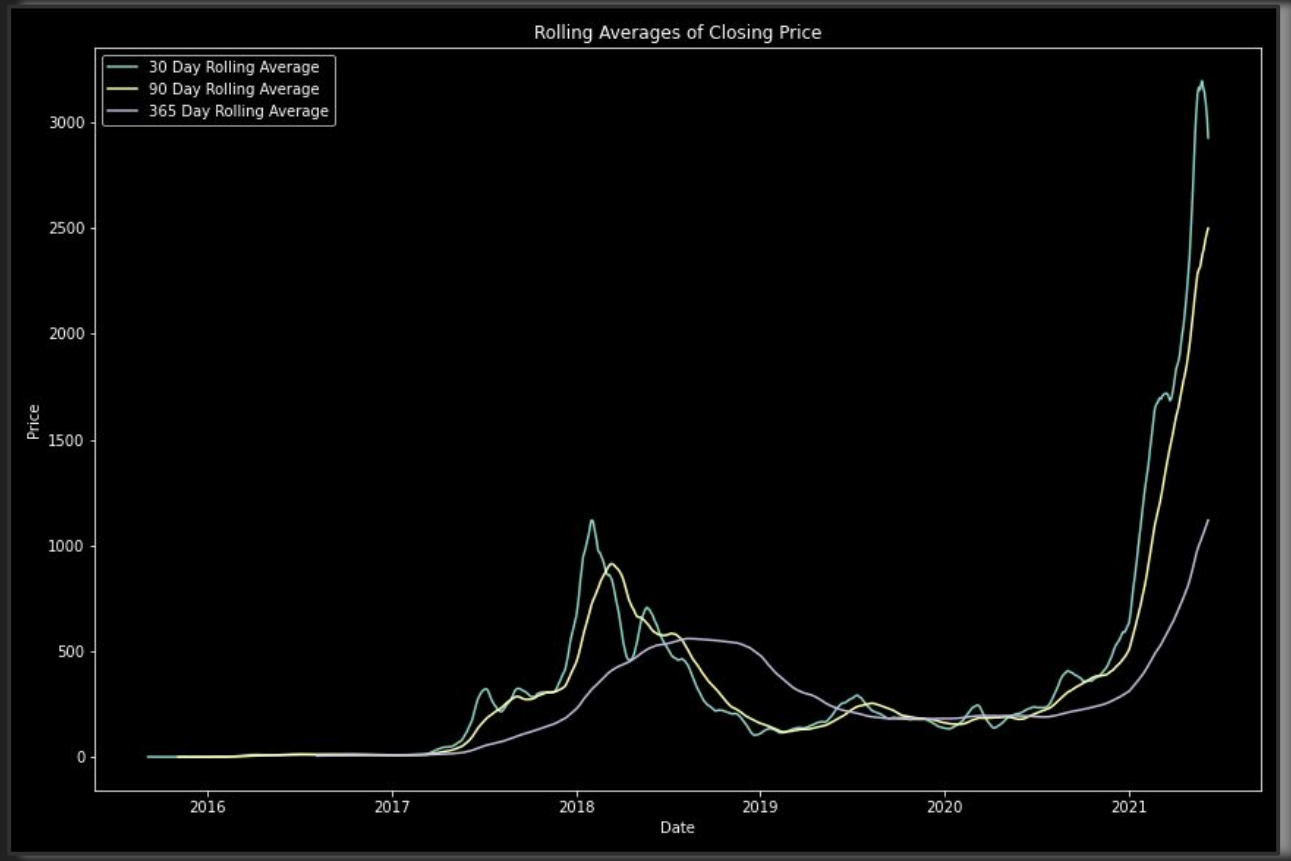
Price Frequency

- High occurrence of low prices
- Very low occurrence of high prices
- Distribution of prices shows that the price remained relatively stationary, then spiked briefly several times



Rolling Averages

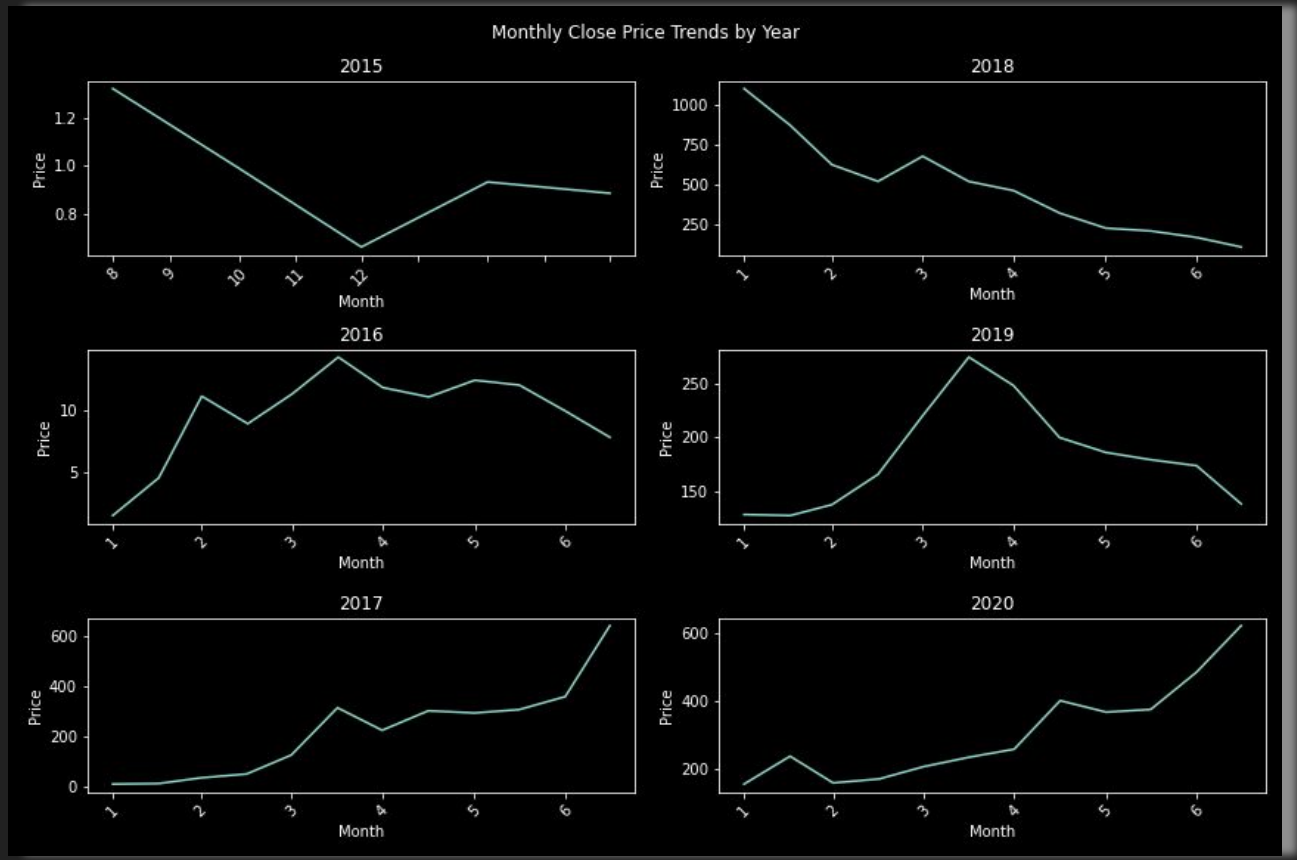
- Rolling averages differ in price across the entire time period
- At times of higher volatility, the price differences are more exaggerated
- Larger windows incorporated more varying prices
- 90-day rolling average had an ending value closest to the true value



Monthly Trends

- The chart shows price movement across all 12 months for each year

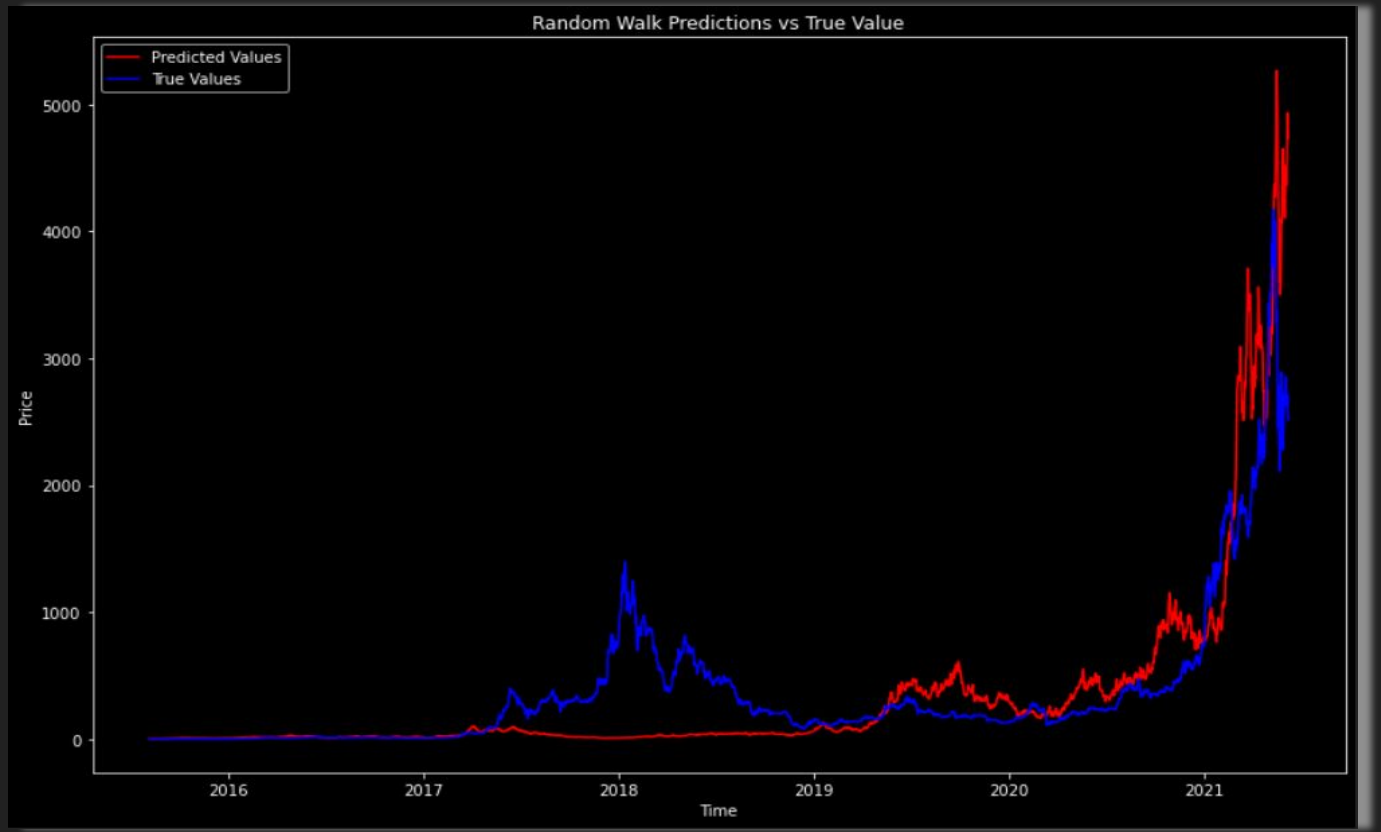
- The price movements do not indicate any clear seasonality



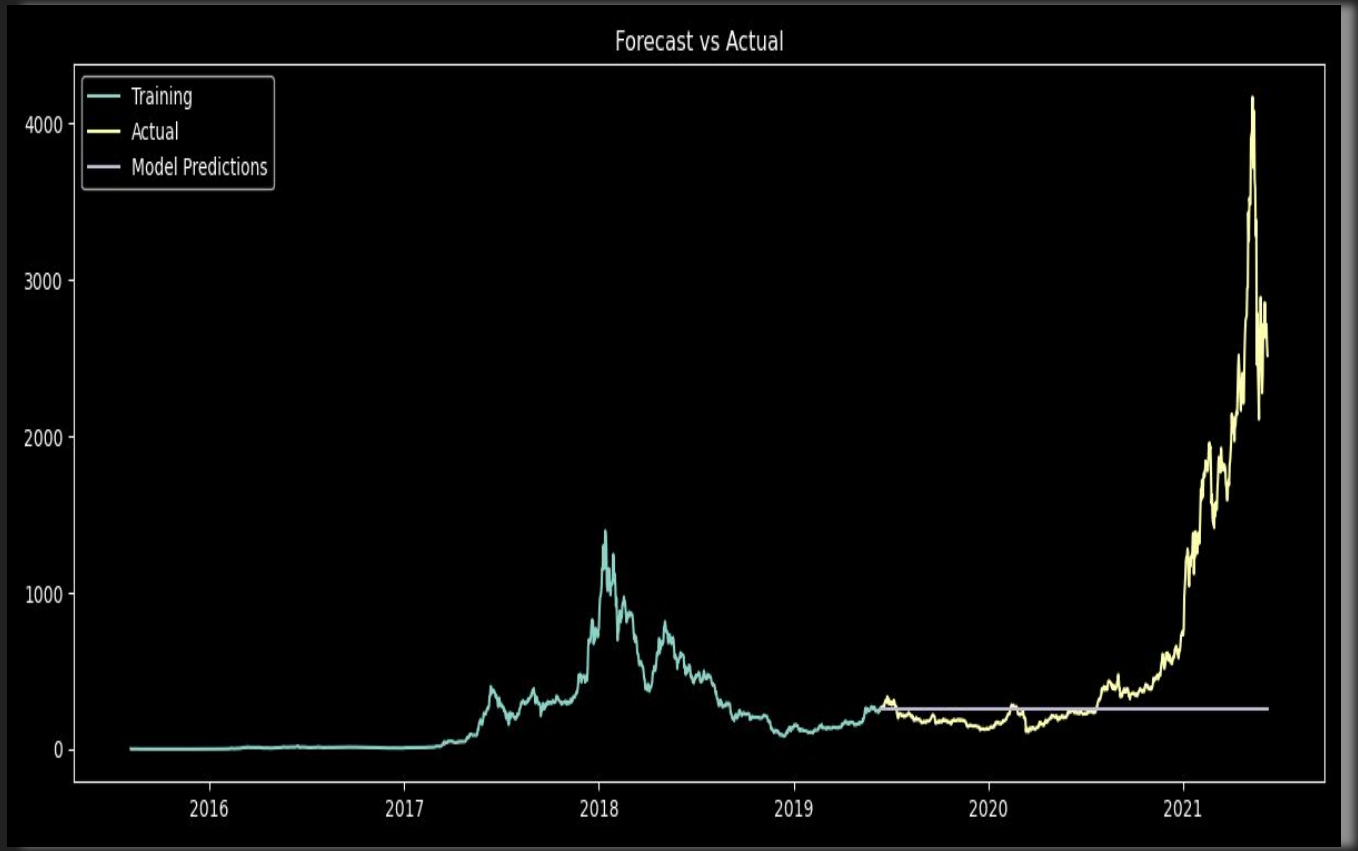
Model Evaluation

Model	***RMSE Value***
Random Walk	323.097
ARIMA	915.550
SARIMA	658.58
One-Step-Ahead	72.12
LSTM	302.61
BEST MODEL	ONE STEP AHEAD

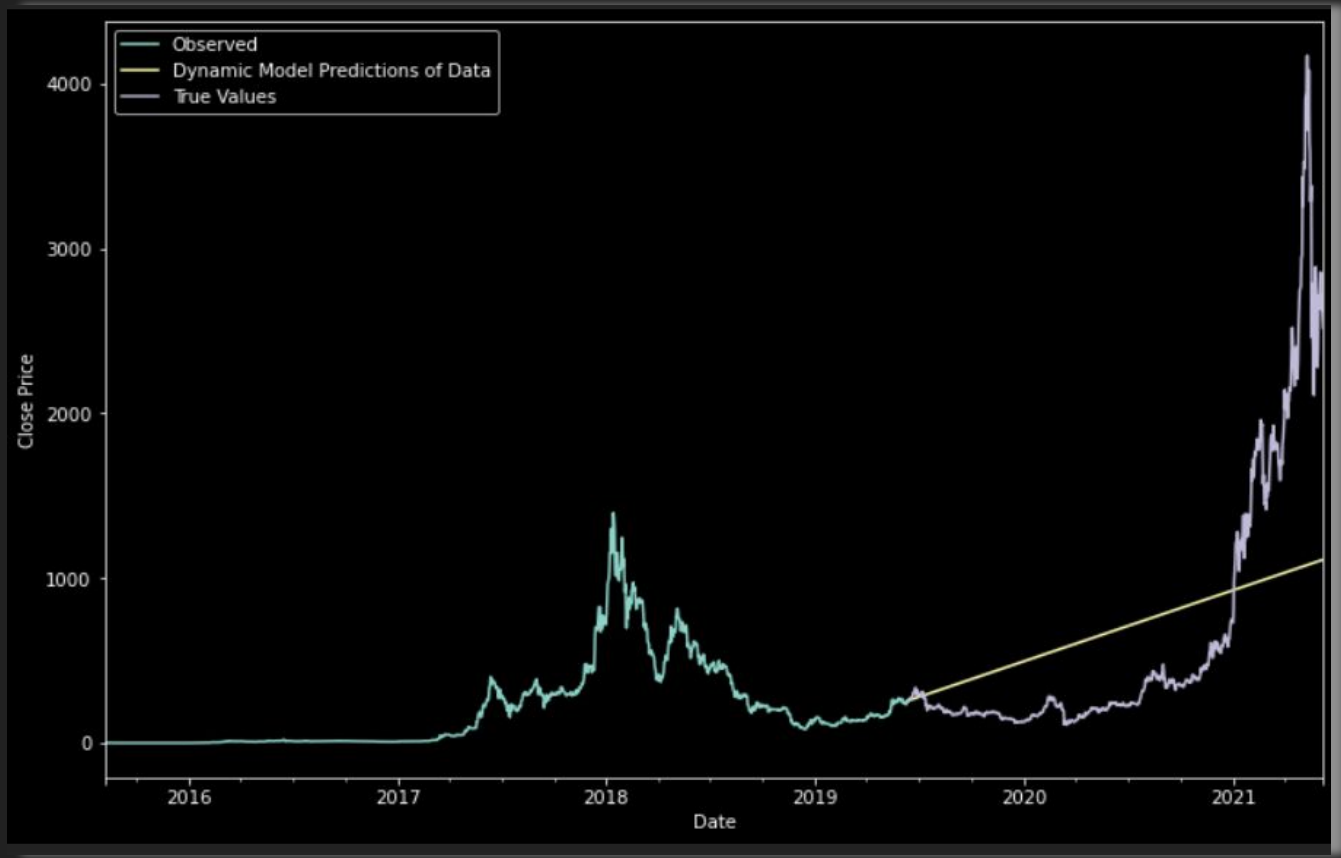
Random Walk: RMSE = 383.27



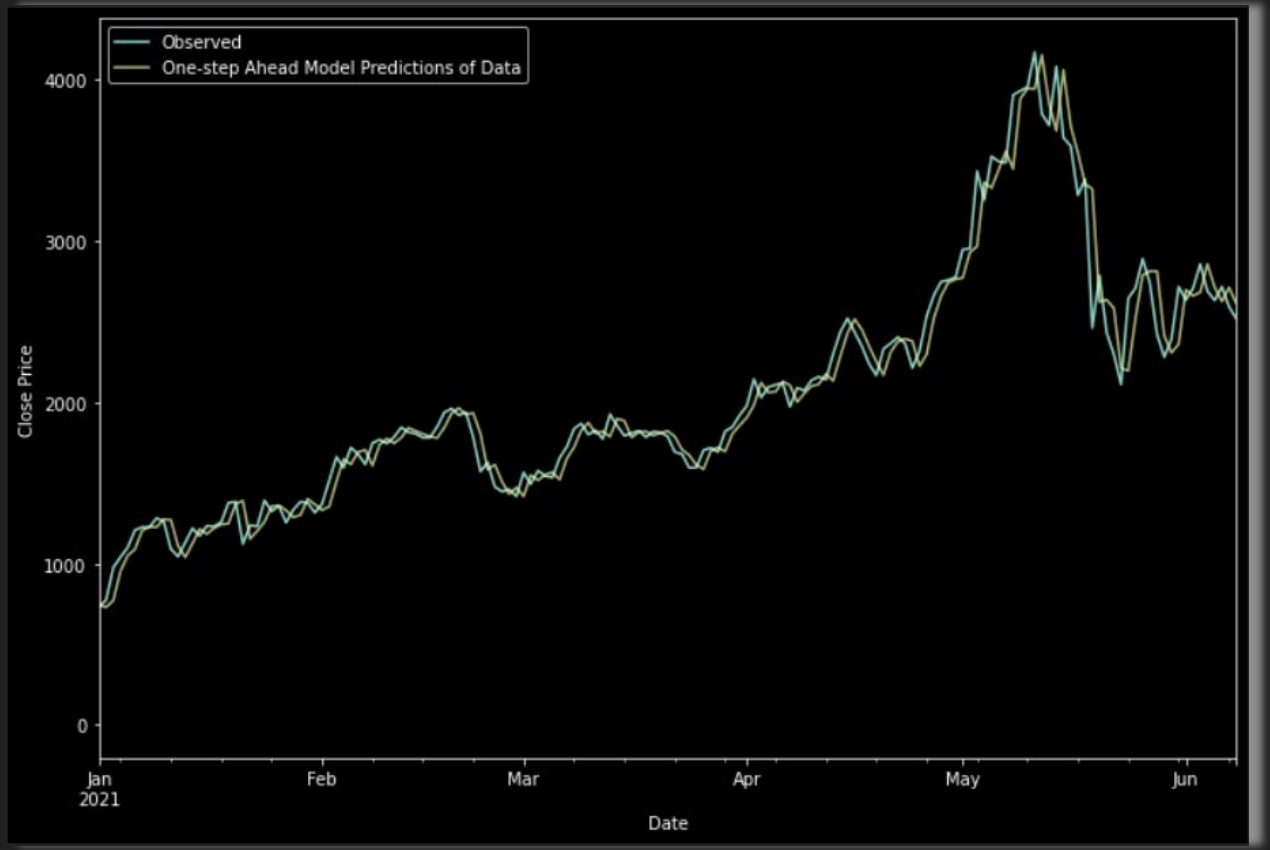
ARIMA Forecast: RMSE = 915.550



SARIMA: RMSE = 658.58



One-Step-Ahead: RMSE = 72.12



LSTM: RMSE = 302.61

Conclusion

- One-Step-Ahead is most accurate
- Only effective for predicting one day ahead, not further into future
- Models such as LSTM or other unnamed models may be more effective at predicting in the long term

Further Ideas/Plans

- Calculate profit potential for One-Step-Ahead model over the testing set time period
- Improve LSTM model through the use of exogenous variables
- Test other models for long-term predictions to target a broader audience and expand the business goal

Contact Info

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