Cryptocurrency Price Prediction

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Objective/Methodology

- To build a price prediction model for cryptocurrency (specifically for bitcoin) based on historical prices and other features (market microstructure, economics indicators etc.).
- https://www.bitcoin.com/
- https://public.bitmex.com/?prefix=data/
- Multi-factor model (linear regression)
- Time Series Statistical Model: ARIMA
- Machine Learning/Deep Learning Models
  - K-Nearest Neighbors
  - Neural Network

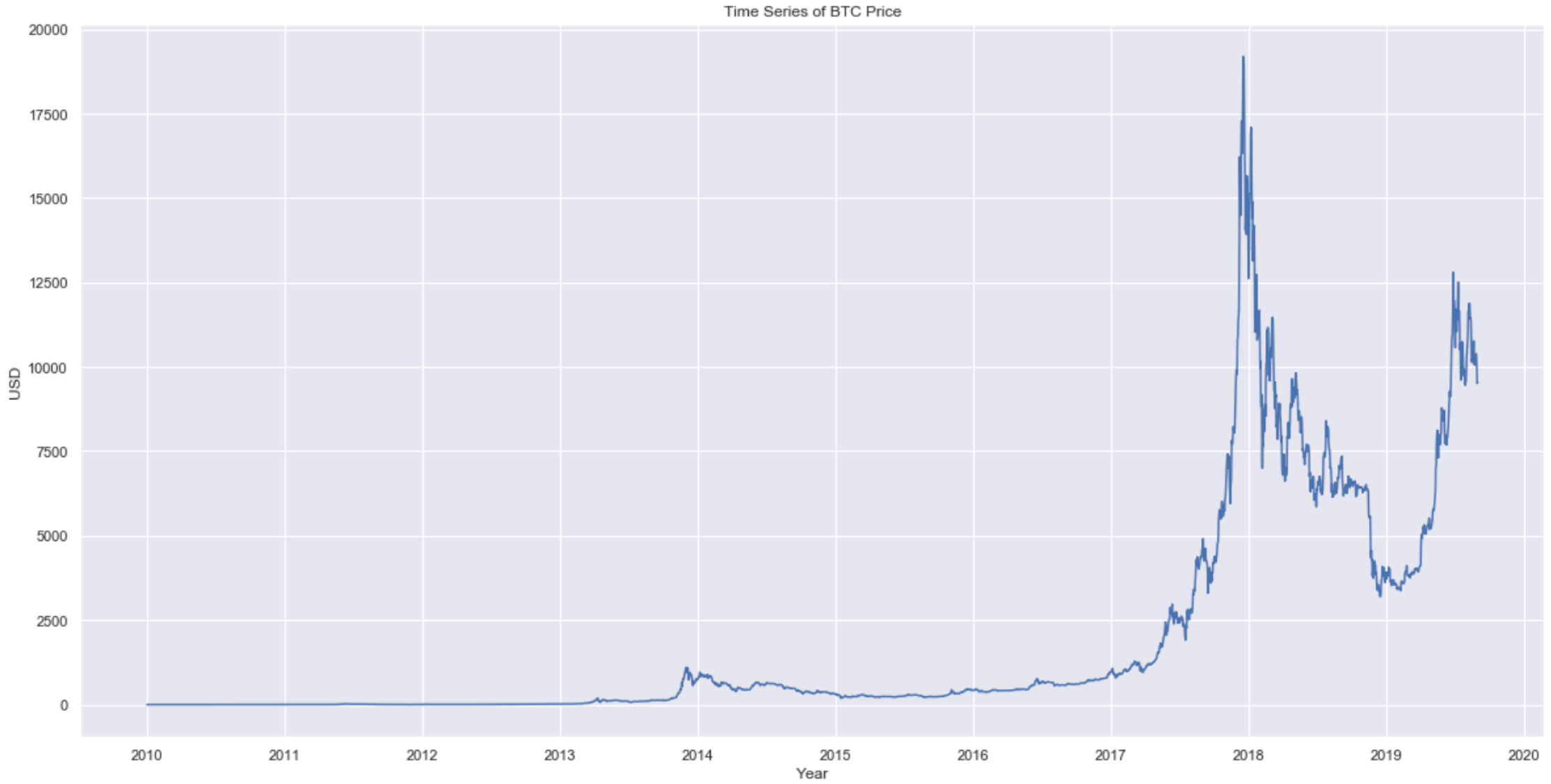
Build and Train Models

- 1. Build 2 simple benchmark predictions.
  - Benchmark 1: average (prediction is an average of the BTC prices in the lookback period)
  - Benchmark 2: last value (prediction is the most recent price in the lookback period
- 2. Build and train KNN/Simple Neural Network model
- 3. Build and train RNN model with LSTM/GRU layer
- 4. Ensemble model that combines predictions from an RNN and ARIMA Model.

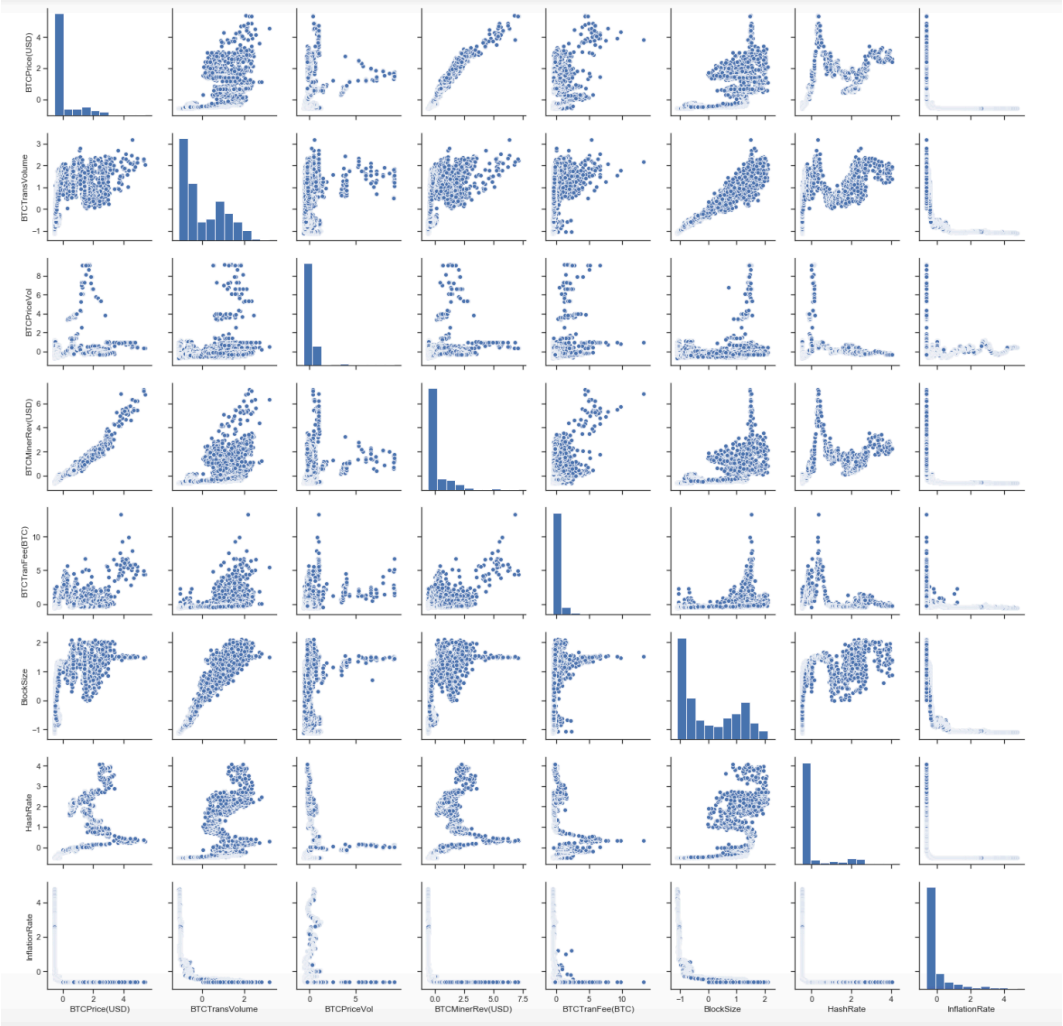
Evaluation

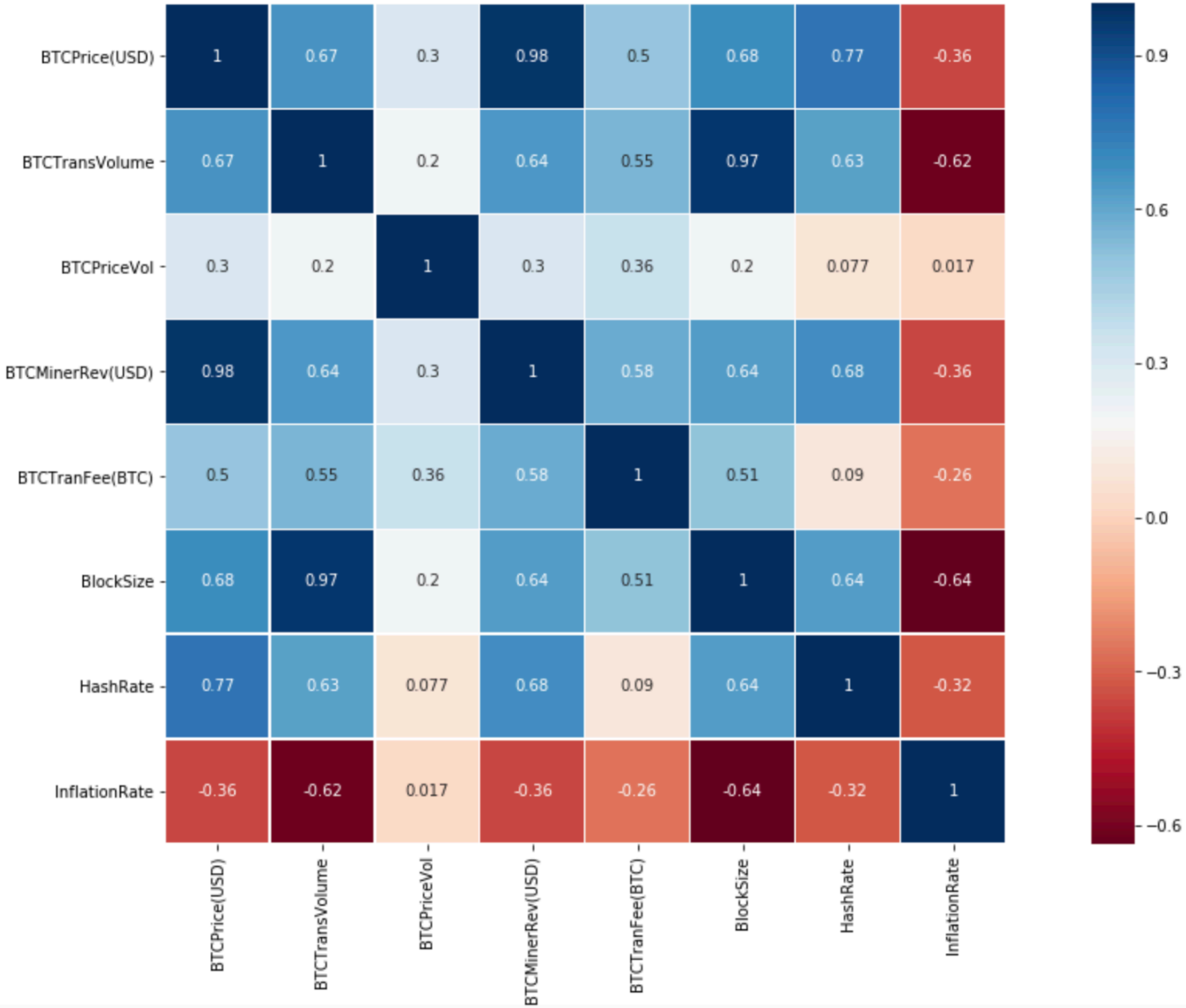
- Explore different models and compare with each other
- Evaluate each of the models on the test set and calculate MAE and RMSE
- Identify and explain which model performs best.

Time Series of BTC prices

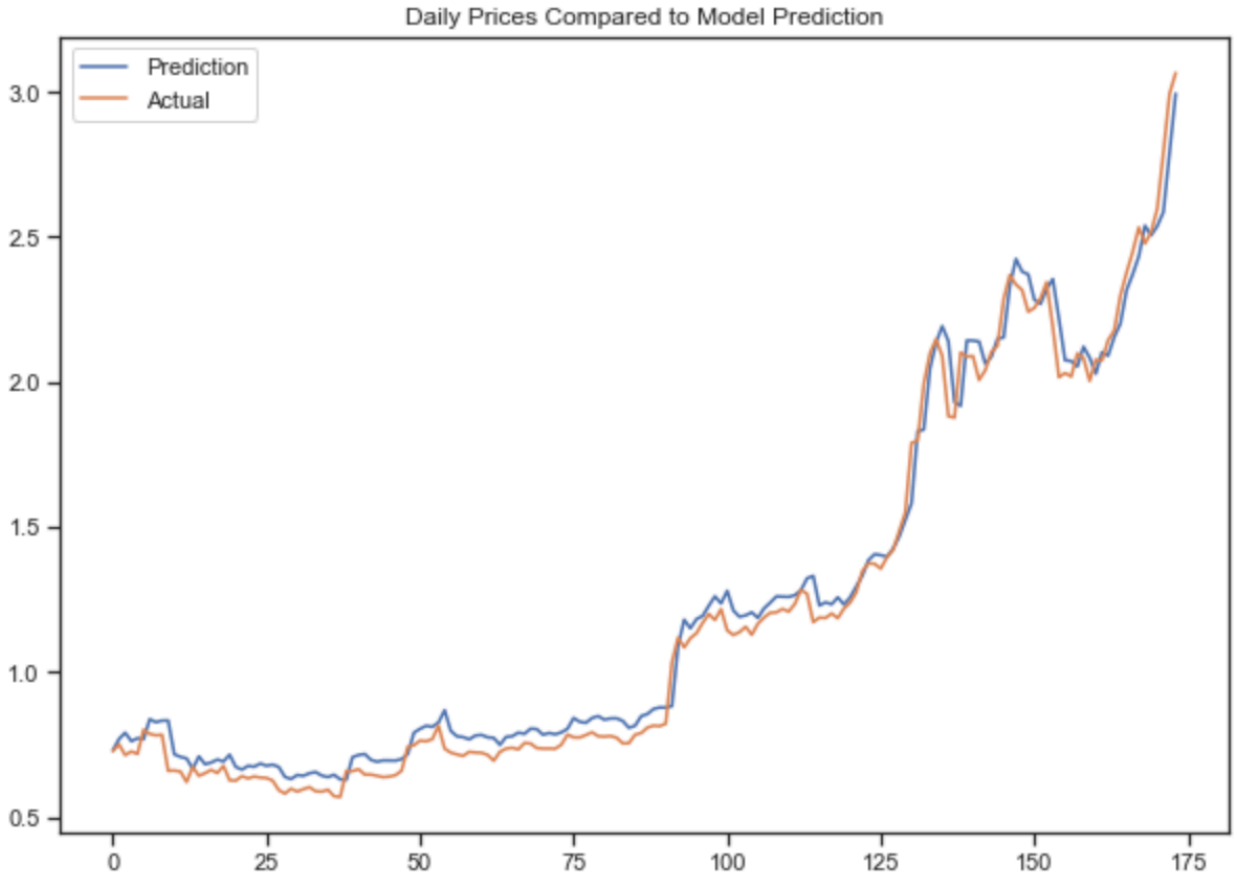


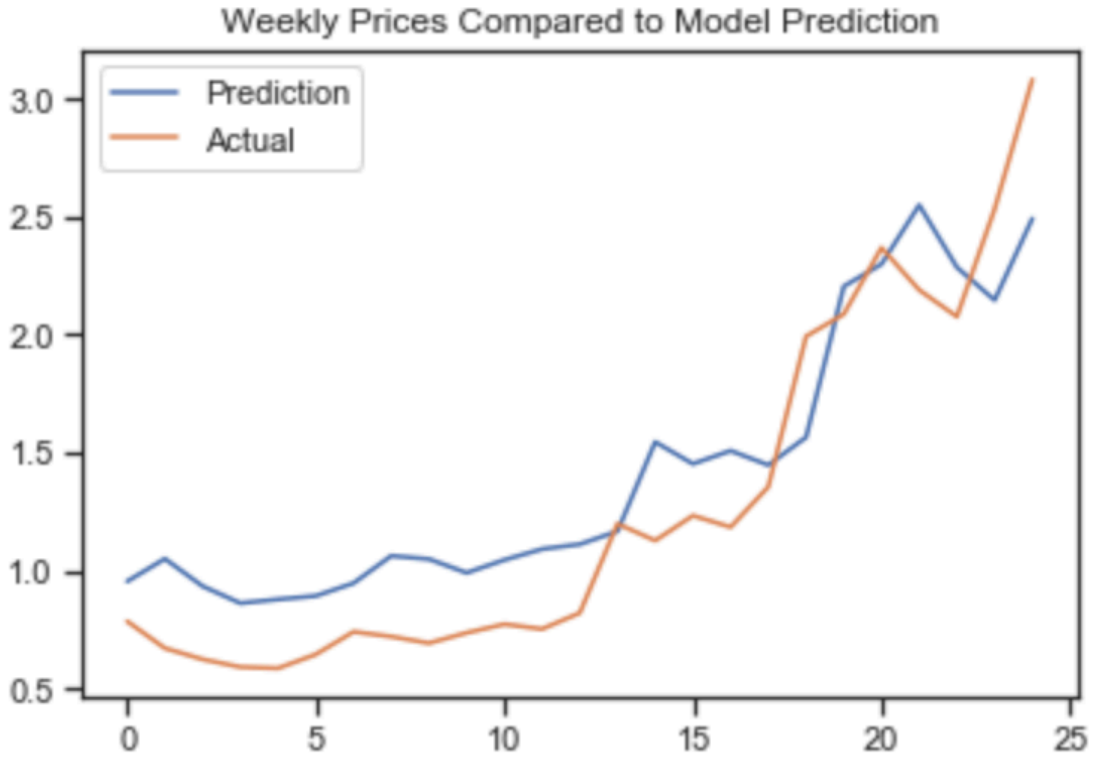
Interesting Plots:





Prediction


Daily Prices Compared to Model Prediction
Prediction
Actual
3.0
2.5
2.0
1.5
1.0
0.5
0
25
50
75
100
125
150
175


Weekly Prices Compared to Model Prediction
Prediction
Actual
3.0
2.5
2.0
1.5
1.0
0.5
0
5
10
15
20
25