



Neural Network for TechInvest

By Terry Thompson



Goal

- Time Series using LSTM Neural Network
- Forecast 7 days of the NASDAQ based on historical data
- 2 variables:
 - Closing Price
 - Volume

Variables in Dataset:

- Date
- Open
- High
- Low
- Close

	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	2002-07-01 00:00:00-04:00	4.192588	4.192588	4.192588	4.192588	3900	0.0	0.0
1	2002-07-02 00:00:00-04:00	4.332342	4.611848	4.192589	4.228925	21000	0.0	0.0
2	2002-07-03 00:00:00-04:00	3.913083	4.472094	3.913083	4.192588	30600	0.0	0.0
3	2002-07-05 00:00:00-04:00	4.192588	4.192588	4.192588	4.192588	1500	0.0	0.0
4	2002-07-08 00:00:00-04:00	3.913082	3.913082	3.913082	3.913082	900	0.0	0.0
...
4653	2020-12-22 00:00:00-05:00	41.285344	42.374107	41.191091	42.218105	3123300	0.0	0.0
4654	2020-12-23 00:00:00-05:00	42.409853	42.491106	41.581092	41.584343	1479300	0.0	0.0
4655	2020-12-24 00:00:00-05:00	41.594095	41.841099	41.467342	41.802097	575400	0.0	0.0
4656	2020-12-28 00:00:00-05:00	41.951602	41.997102	41.574594	41.876850	1376100	0.0	0.0
4657	2020-12-29 00:00:00-05:00	42.136854	42.208356	41.893101	41.971100	910800	0.0	0.0

4658 rows × 8 columns

Historical Closing Price

Begins 2002

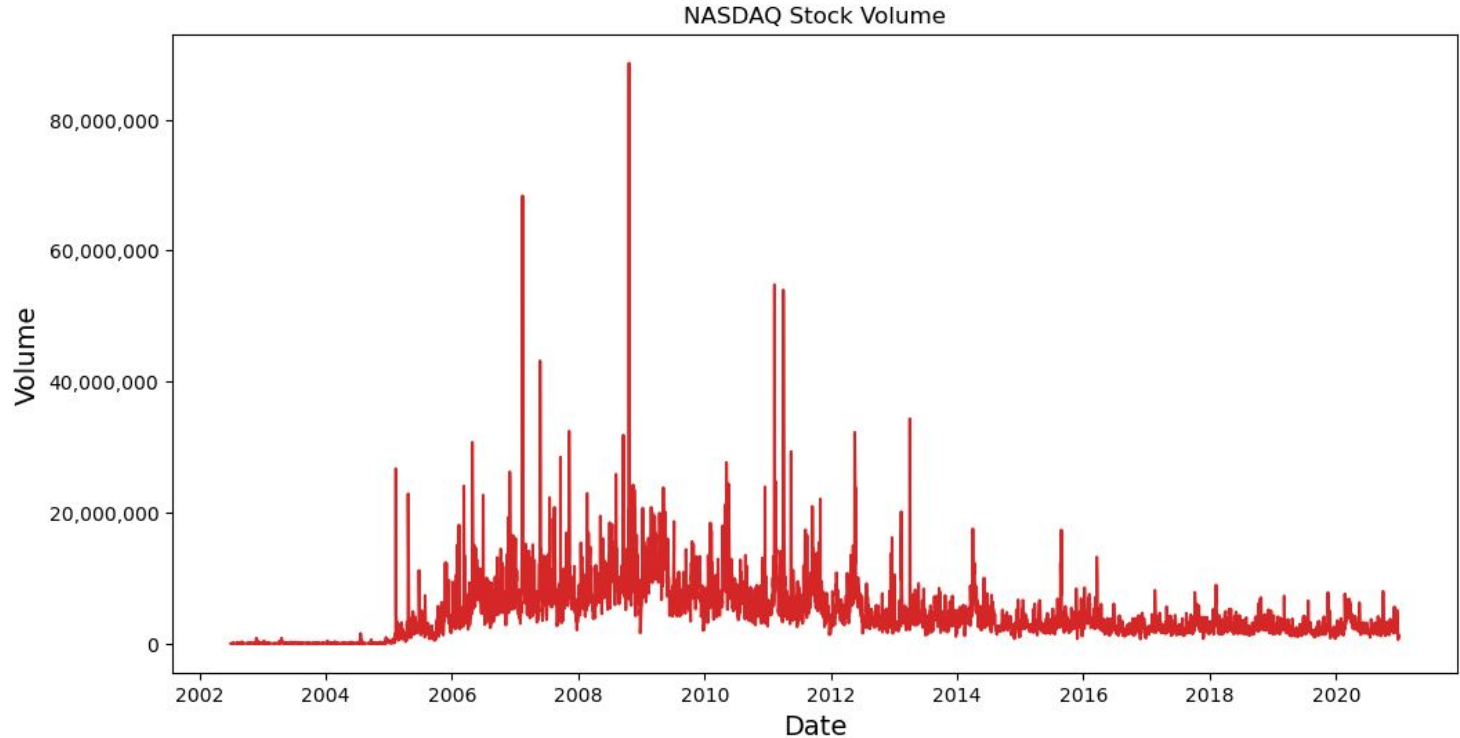
Ends 2020



Volume

Spikes indicate
major change
in price trend

2014 onward
trading
stabilizes

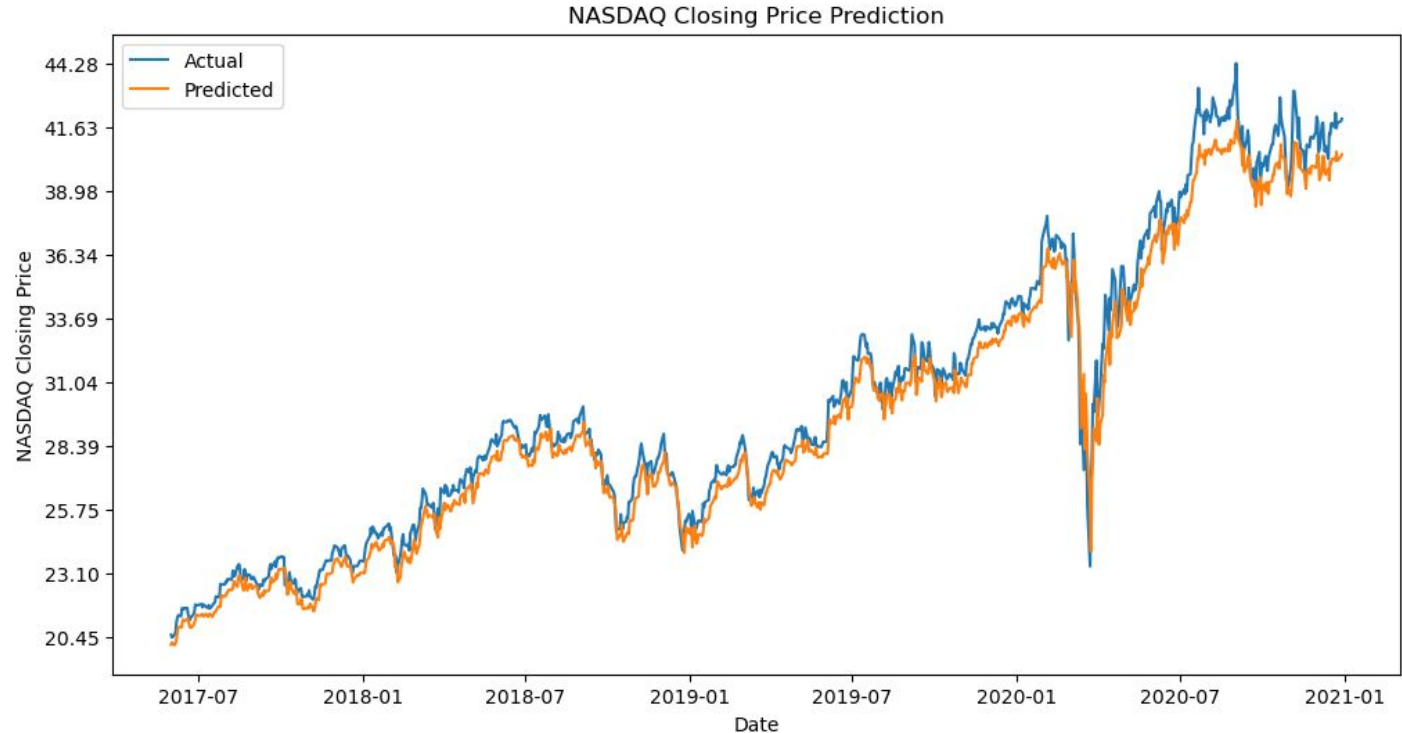


Closing Price Prediction

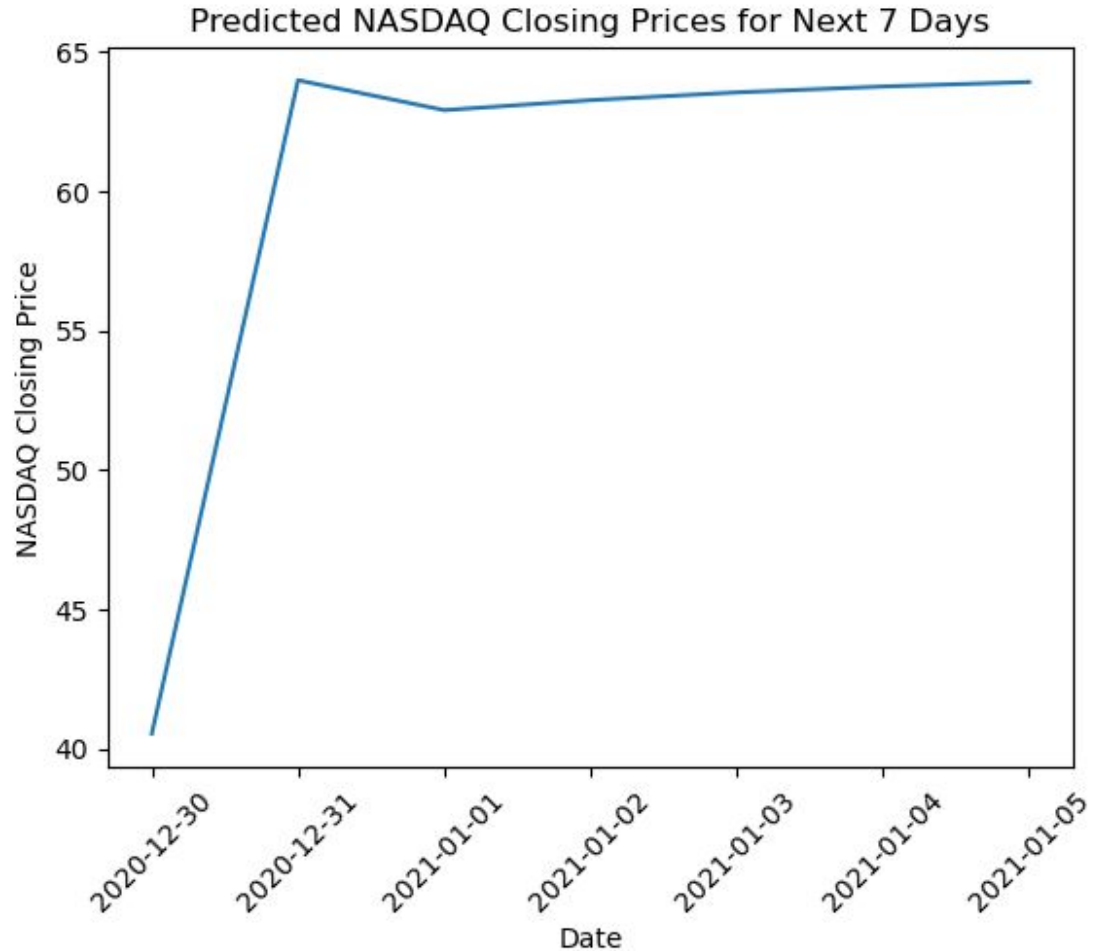
LSTM Neural
Network

Data split using
sliding window
method

RMSE chosen as
loss function



- Ran model for 7 days after given historical data
- Results show upward trend



Conclusion

- **Good RMSE based on the models performance**
- **Predictions follow actual trends well, without overfitting**
- **This model prediction is based on only a few variables**
- **Unaccounted influences:**
 - **Public sentiment**
 - **Governmental policies**
 - **Unforeseen events**

Further Actions

- **Incorporate mechanisms that allow the data to be scraped and incorporated:**
 - **twitter analysis**
 - **proposed legislation**
 - **other current economic factors**

Thank You!

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