

Nvidia Stock Prediction with Time Series Models

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Business Problem & Contents


Business problem

This project aims to provide an updated time series forecasting for investment banks to predict better Nvidia future stock price.

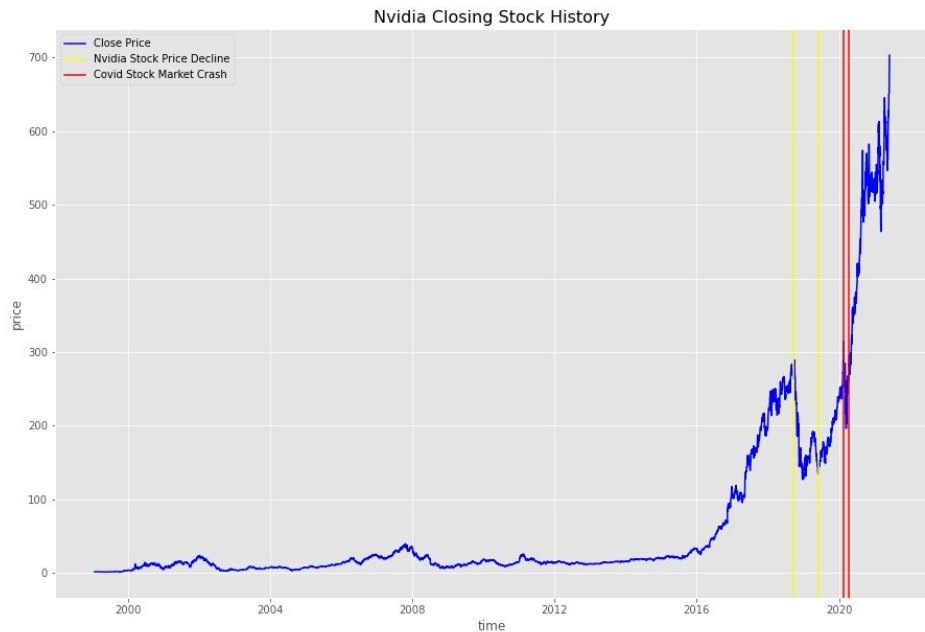
Contents

The popularity of cryptocurrency caused a shortage in the graphics card market, and it led increasing of stock price of a graphics card supplier, Nvidia.

Nvidia closing stock price will be predicted with Nvidia's stock historical data, AMD stock price, Google trend, Nvidia revenue and bitcoin price by using ARIMA, LSTM, and Prophet.

A decorative background graphic at the bottom of the slide. It features a light blue line graph with circular markers at various points, showing an overall upward trend with some fluctuations. Below the line graph is a series of vertical bars of varying heights, creating a bar chart effect. The entire graphic is rendered in a light blue color that matches the slide's theme.

Data - Nvidia Closing Stock History



- 09/16/2018 ~ 06/01/2019

- Slowing global economy
- Trade war
- Poor future expectation

- 02/20/2020 ~ 04/07/2020

- 2020 stock market crash

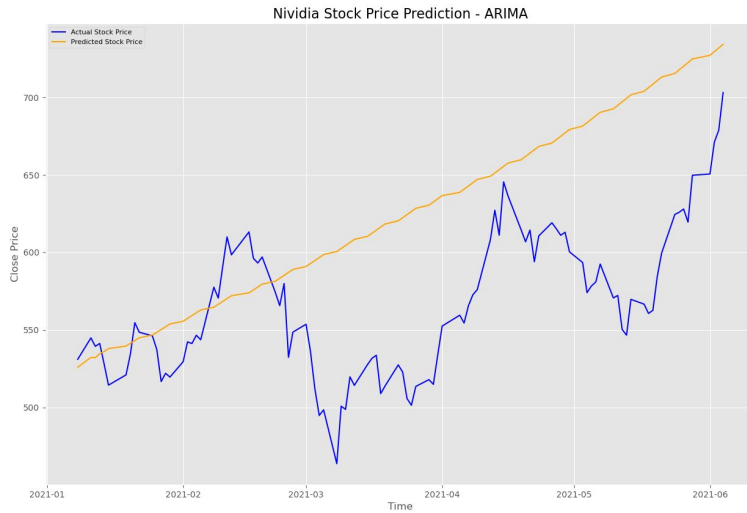
Data - Exogenous Variables



- Exogenous Variables
 - Previous day AMD stock close
 - Previous day Bitcoin close
 - Revenue
 - Google trend

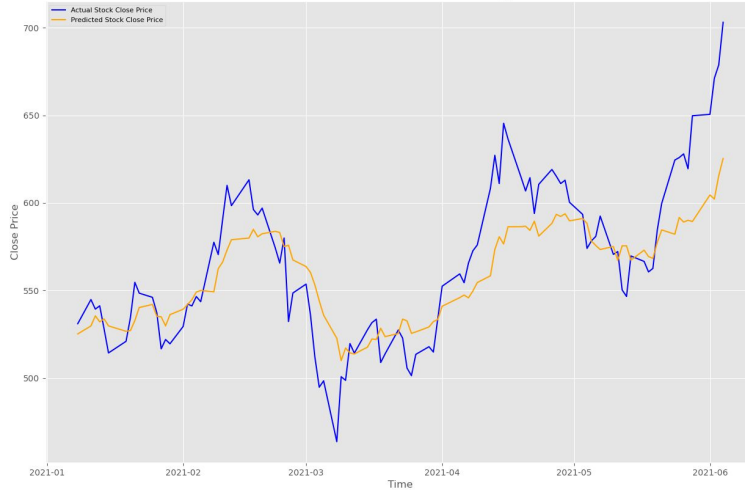
Model 1 - ARIMA

- Used Auto Arima
 - Order: (2, 1, 0)
- Result
 - RMSE: 77.55
 - %RMSE: 0.14



Model 2 - ARIMA with Exogenous Variables

Nvidia Stock Price Prediction - ARIMA with Exogenous Variables



- Used Auto Arima
- Order: (2, 1, 0)
- Result

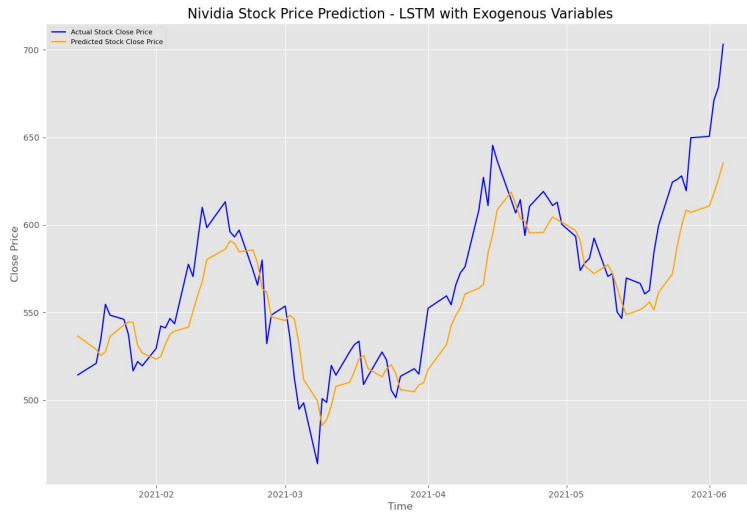
	With All Exogenous Variables	Without Bitcoin Close	Without Bitcoin Close and Trend
RMSE	70.83	69.64	26.49
%RMSE	0.125	0.123	0.046

Model 3 - LSTM

- Create data in 5 timesteps

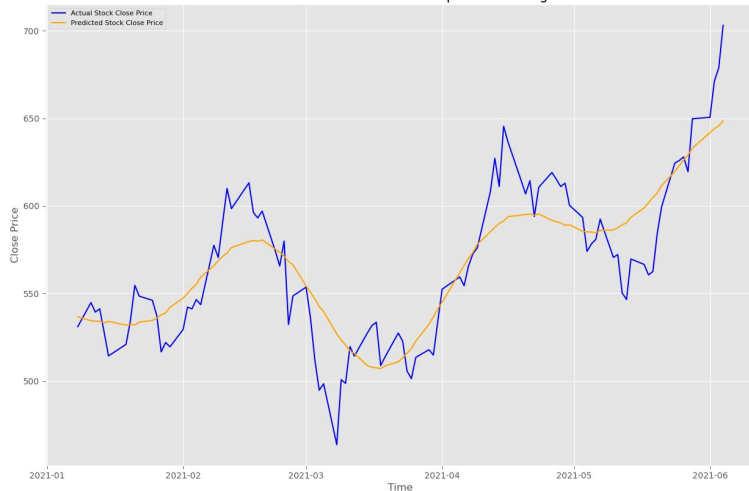
- Result

- RMSE: 25.56
- %RMSE: 0.040



Model 4 - Facebook Prophet

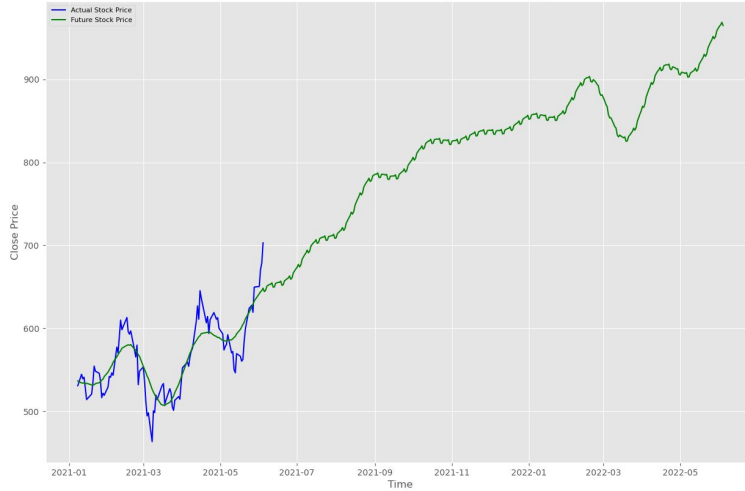
Nvidia Stock Price Prediction - Facebook Prophet with Exogenous Variables



- Yearly, Daily seasonality
- Result
 - RMSE: 22.05
 - %RMSE: 0.039
- Profit from trading at the change points
 - 58%

Model 4 - Facebook Prophet

Nvidia Stock Price Prediction - Facebook Prophet with Exogenous Variables



- Predicted Nvidia stock price on 6/4/22
- \$965 per share

Conclusion

- I chose Prophet model because its RMSE is lowest.
- During test dataset period, expected profit from trading at the change points is 58% and expected stock price on 6/4/2022 is \$965.
- Yearly, daily seasonality feature can cause overfitting.



Next Step

- Find the way to overcome overfitting which is caused by seasonality
- Find other exogenous variables



THANKS!

Any questions?

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