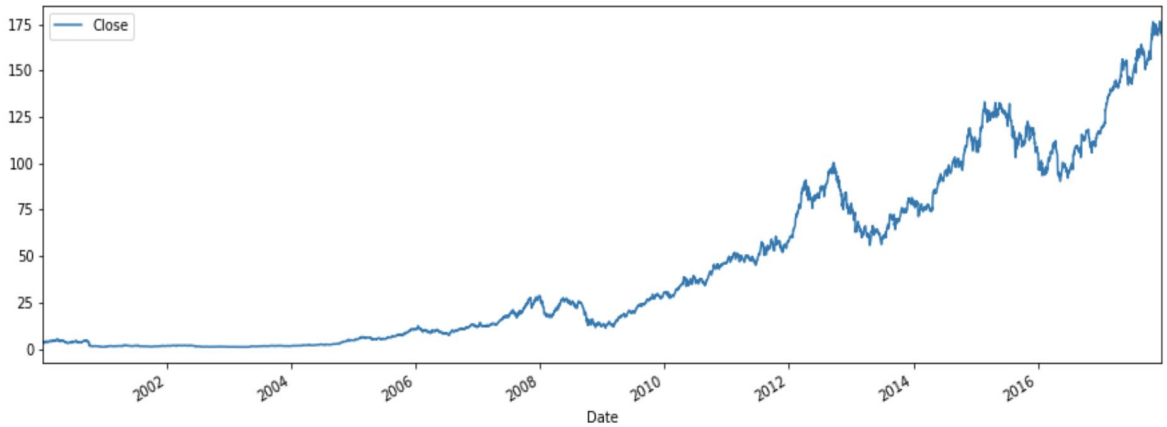
NYU

Stock Price Prediction

- Surbhi Thole (sst390)
- Binal Modi (bjm470)

Background

- Our goal is to predict the stock prices of Apple Inc. (AAPL) using ARIMA model for time series forecasting based on closing price of stock.
- We also aim to analyze the impact of market news on the stock prices by correlating the sentiments of news and the corresponding stock price change on the same day.



Time series Plot for Apple Stock prices from 2000 - 2017

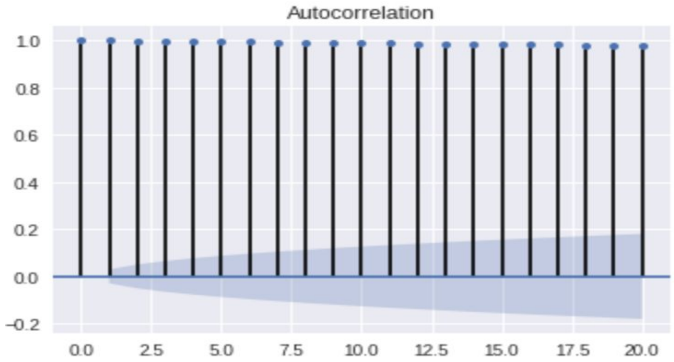
Current Progress

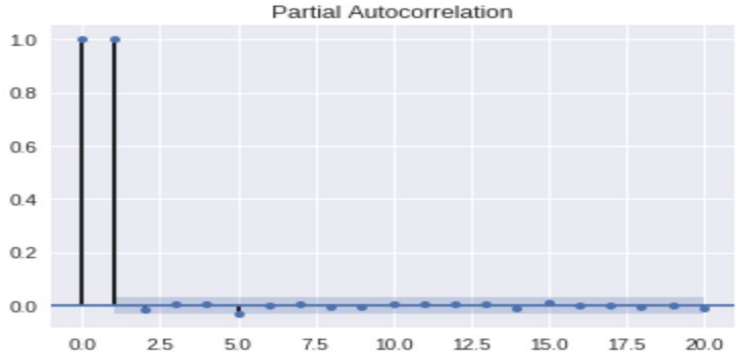
Processing

- To ensure if the time series is stationary we checked for seasonality and trend, using the Augmented Dickey--Fuller statistic

```
Performing Augmented Dickey-Fuller Test to confirm stationarity...
ADF Statistic: 1.4810999234852817
p-value: 0.9974531471802195
p-value > 0.05, Time Series NOT Stationary
```

- Made the data stationary using differencing parameter d in ARIMA
- To determine the parameters (p,d,q) for ARIMA, we plotted ACF and PACF plots and performed grid search using AIC and BIC values

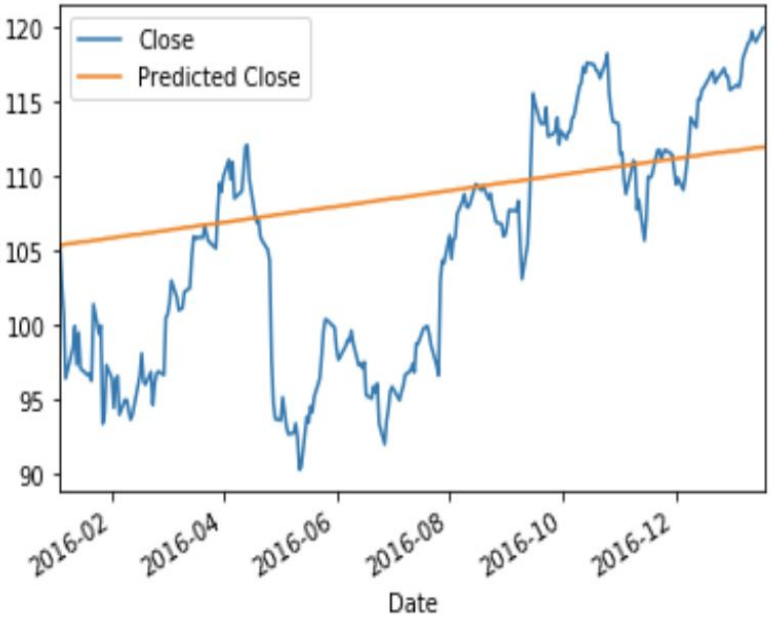




Analysis and Results

Training : 2001-01-03 to 2016-01-03
Prediction : 2016-01-04 to 2017-01-18

Date	Close	Predicted Close
2016-01-04	105.349998	105.321913
2016-01-05	102.709999	105.415030
2016-01-06	100.699997	105.439362
2016-01-07	96.449997	105.462343



Evaluation

Used MAE and MFE for evaluation of the model

```
Mean Absolute Error: 6.11267944547
Mean Forecast Error: -3.5041550268
```

Future Goals

Sentiment Analysis of news data

- Collecting news data from NYTimes API and pre-processing it to extract key information of articles
- Analyzing the sentiments using NLP toolkit and sentiment intensity analyzer from Vader Library.
- To evaluate the performance of sentiment analyzer using metrics such as AUC ROC curve

Analyze correlation with stock price change

- Using Pearson's correlation coefficient analyze correlation between news sentiments and change in stock prices

NYU

THANK YOU !!!