

Advanced Time Series Analysis (IT 833)

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Assignment Report for Question 6

Introduction

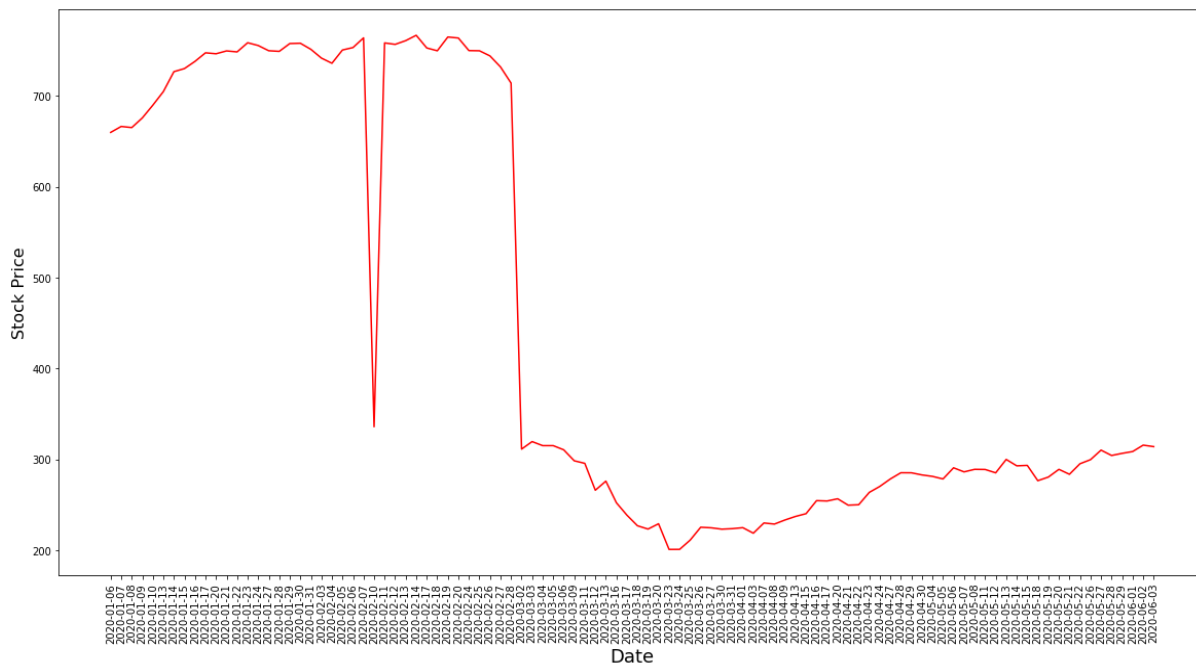
During the times of crude oil crisis, the whole stock market takes a hit. In this project, I have predicted stock prices using crude oil prices taken during the recent crude oil crisis.

Dataset

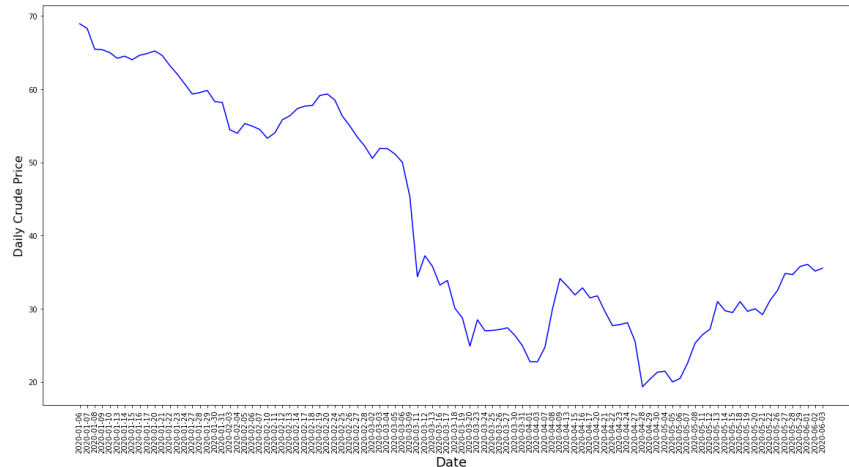
Stock Price dataset was taken from [here](#). The prices are of TATA Chemicals. Crude Oil dataset was taken from [here](#). The crude prices are of BRENT Crude. Both datasets were taken from January 1, 2020 to June 3, 2020.

Dataset Visualization

Below are the plots of both the datasets.



TATACHEM stock price Time Series



BRENT Crude Price Time Series

Correlation

The correlation between Crude Oil Price and Stock price is 0.89876835. From this we can understand that core companies like TATA Chemicals are heavily dependent on crude oil. As the Crude Oil Price dropped TATA Chemicals stock price also dropped.

Methodology

The dataset was divided in 80% training data and 20% testing data Since, the dataset is small, for better prediction I have selected three features:

1. Crude Oil Price
2. Average Crude Oil Price of last 3 days
3. Average Stock Price of last 3 days

Then the features were fitted using Linear Regression.

Model Evaluation

The RMSE of the model is 5.782573076496831 and R^2 score is 0.7277907466311838.

Stock Price Prediction

Below is the plot of the actual stock prices and predicted stock prices on testing data.

