**Data Science Project**

Name: Azeem Khalid  
Roll #: 15k-2845

Sec: GR-2

**Topic:** Multivariate Time Series Forecasting of Crude Palm Oil Price Using Machine Learning Techniques.

**Abstract:**

The aim of this paper was to study the correlation between crude palm oil (CPO) price, selected vegetable oil prices (such as soybean oil, coconut oil, and olive oil, rapeseed oil and sunflower oil), crude oil and the monthly exchange rate. Comparative analysis was then performed on CPO price forecasting results using the machine learning techniques. Monthly CPO prices, selected vegetable oil prices, crude oil prices and monthly exchange rate data from January 1987 to February 2017 were utilized. Preliminary analysis showed a positive and high correlation between the CPO price and soy bean oil price and also between CPO price and crude oil price. Experiments were conducted using multi-layer perception, support vector regression and Holt Winter exponential smoothing techniques. The results were assessed by using criteria of root mean square error (RMSE), means absolute error (MAE), means absolute percentage error (MAPE) and Direction of accuracy (DA). Among these three techniques, support vector regression(SVR) with Sequential minimal optimization (SMO) algorithm showed relatively better results compared to multi-layer perceptron and Holt Winters exponential smoothing method.

References:

<http://iopscience.iop.org/article/10.1088/1757-899X/226/1/012117/meta>