Paper name: **Stock Price Prediction Using the ARIMA Model**



Impressions – various statistic evaluation methods.

Measure criteria BIC, R^2, standard error of regression

BIC(Bayes Information Criterion) to avoid overfitting. Smaller is better.

= klog(n) – 2log(L) (k: # of parameters, n: # of observations, L: max value of likelihood )

R^2(Coefficient of determination) – proportion of the variation in the dependent variable from independent variable.

Shortcomings – too small dataset(two stocks)

Plan

* Data Analysis

1. Check seasonality
   1. To check seasonality, visualize the time series data

* Parameter selection

1. ADF Test
   1. In the time series analysis, stationarity is important. Therefore, conduct ADF test for various **differencing numbers(d).**
2. **PACF(Partial Auto Correlation Function)**
   1. **Yt and Yk, et and ek have correlations. To define the p(degree of autocorrelation) and q(degree of moving average), do the PACT.**
3. **AIC/BIC Test**
   1. To prevent overfitting, use AIC=−2log(L)+2(p+q+k+1).

* **Implement**

1. **Libraries**
   1. Numpy – for general purpose
   2. Pandas – for data import and use
   3. Matplotlib – for data visualization
   4. Statsmodels – for ARIMA training and statistical tests.
2. Train and Evaluation
   1. Train/Test - 80/20
   2. Evaluate parameters with R^2, standard error of regression.