DS-670-Capstone: Big Data & Business Analytics

Assignment 9: Performance Analysis

March 25th 2017, Madhumita D

Code: The code for stock analysis is attached in the document (Assignment9-Performance_Analysis.PDF) and it can be divided into 3 parts.

a) **Data Preparation** – Here returns of each stock is calculated based on price and normalization of selected indicator data is done.
b) **Neural Network modelling** – For every quarter (March 2011 – September 2014) neural network model was run and weights from each model were gathered in a matrix for further analysis.
c) **Time Series Analysis** – Time Series modelling for gathered weights is done using the Arima function to predict the weights of next 5 quarter's stocks (December 2014 – December 2015).

Performance Analysis:

a) **Time for each operation:** The complete analysis took about 153 minutes and the time for each operation is mentioned below.
   - Data Load (20 seconds)
   - Data Preparation (123 seconds)
   - Neural Networking modelling (150 minutes)

   In Traditional Neural Network Modeling it took about 60 minutes for each model (15 quarters – 15 models) to run. Now each model takes about 10 minutes when we use Threshold and Stepmax parameters in 'neuralnet' function.
   - Time Series Analysis (5 seconds)

b) **Bottleneck:** Neural network technique takes a lot of time to learn the algorithm for one particular model. Using the parameters 'Threshold' and 'Stepmax' reduces this problem mostly.
c) **Optimization:** Instead of normalizing each row in every dataset manually and repeating the same code, I have used loops and conditions for code efficiency. Also used the same level of optimization while predicting weights in time series analysis.