Project B - Description

The data set `market_index_clean.csv` contains a number of financial indices recorded between April 11, 2003 and September 11, 2015. The variables in the dataset are:

- `Date`: The date (YYYY-MM-DD)
- `AAPL`: The Apple Stock quote
- `SPX`: The S&P 500 Index (an aggregate measure of market growth)
- `VIX`: The CBOE Volatility Index (a measure of the current magnitude of price fluctuations in the market)
- `SPGSCITR`: The S&P Goldman Sachs Commodity Index (a measure of the value of non-manufactured commodities such as wheat, oil, etc.)
- `BNDGLB`: The Dow Jones Barclays Capital Bond Index (a measure of the value of bonds issued in the US)
- `EEM`: Morgan Stanley Emerging Markets Index (a measure of the performance in 21 emerging economies such as China, India and Russia)

The goal of this project is to model the return of Apple on day i using current and past market information up to day $i-1$. The return of Apple Stock on day i is defined as

$$\texttt{ret.AAPL}_{\texttt{i}} = \frac{\texttt{AAPL}_i - \texttt{AAPL}_{\texttt{i-1}}}{\texttt{AAPL}_{\texttt{i-1}}} ,$$

or you can consider a standardized return defined as $\texttt{ret.AAPL}_{w_i} = \texttt{ret.AAPL}_i/\sqrt{\texttt{VIX}_{i-1}}$. You may consider the autoregressive models as you have seen in Question 3, Assignment 3. You may also wish to address the following questions:

- What are the most important factors affecting Apple Stock returns?
- Does including information for several days ago have much of an impact on tomorrow's return, if we account for today's information?
- Does the model predict accurately?