**Quantitative Portfolio Management HW #2**

Notes:

* For Question 1, get data from industry\_portfolio.xlsx (Use the ‘Total Returns’ Sheet for the data)
  + Assets are Industry ETF’s, representing the stock by each industry. (Google to learn which ones which)
  + Includes SPY, the overall Market ETF.

**Market Exposure**

1. Run an OLS Regression of each asset onto SPY (I would use a for loop).
2. Report the following for each regression
   1. Annualized alpha (multiply value by 12)
   2. Beta
   3. Regression’s R-squared
   4. Treynor ratio
   5. Information ratio
3. For each statistic report which asset has the highest value
4. Which asset is the most volatile compared to SPY?

**Return Decomposition**

1. For each non-ETF Asset (assets that don’t start with ‘X’) run a multivariate regression of the asset onto the industry ETF’s.
2. Report each of their alpha and R-squared
3. Which equity is best replicated by industry basket (what regression is most accurate using some measure above)?
4. How would I allocate my portfolio to mimic the returns of Nike (NKE) using just the market ETF’s?
   1. How accurate is this allocation?
5. How would I hedge out my exposure to the tech industry for Apple (AAPL) using the regression data above? (How much XLK to go short/hedge per dollar invested into Cisco)?

**Testing the Accuracy of the Multi-Factor Models.**

Notes:

* Use the excess return data for the Industry Portfolio Data and the Fama-French Data

1. Run a multivariate regression of the industry portfolio data onto the Fama-French Data (You’re running the regression 18 times each onto the 4-factors) **Use a for loop**
2. Report the alpha and r-squared for each of the assets.
3. Calculate the mean-absolute error (Average of the absolute values for all the alphas)

MAE = (1/n) \* Σ|yi – xi|

* 1. If the model worked what should the average alpha be for each of the assets? Did this hold up in practice?