**Project 1: Trading with Momentum - Overview**

For each month-end observation period, rank the stocks by previous returns, from the highest to the lowest. Select the top performing stocks for the long portfolio, and the bottom performing stocks for the short portfolio.

Trading with Momentum consisted of the following steps:

* Read in end of day stock prices from quotemedia, reconfigure to make each date a unique row with stock tickers as columns [var = close] , and resample to select the last price of each month [func = resample\_prices()].
* Derive the monthly log returns [var = monthly\_close\_returns] from one month to the following month using the shift() method.
* Calculate previous monthly returns and lookahead returns using shift\_returns() function.
* Use the get\_top\_n() function to create df\_long & the df\_short, the top performing and bottom performing 50 stocks per month based on last month’s performance. Indicates whether to go long (1) or short (-1) on that stock.
* Calculate portfolio returns for each month (i.e. 2013-09-30) by multiplying the log returns from the subsequent month (i.e. 2013-10-31) by your long/short positions (1,0,-1) derived from the previous month log returns (i.e. 2013-08-31) as indicated by df\_long & df\_short. We will assume every stock gets an equal dollar amount of investment, which makes computing the portfolio's return as the simple arithmetic average of the individual stock returns.
* Calculate portfolio returns for each month (i.e. 2013-09-30) by multiplying the log returns from the subsequent month (i.e. 2013-10-31) by your long/short positions (1,0,-1) derived from the previous month returns (i.e. 2013-08-31) as indicated by df\_long & df\_short. Because each stock gets an equal dollar amount of investment, you divide each stock's log returns by the total number invested (2 \* n\_stocks) to get the amount attributed for that individual stock.
  + If going long, then multiply 1 by returns divided by n\_stocks (5) b/c each stock gets an equal amount.
  + If going long, and returns is positive, then making money (1 \* 1), if negative, then losing money
  + If going short, then multiply -1 by returns divided by n\_stocks (5) b/c each stock gets an equal amount.
  + If going short, and returns is negative, then making money (- \* -1), if positive, then losing money.
  + If went long and short on same stock, then cancels out, so zero.
* Next, we calculate the mean, standard error, and annualized return and conclude by performing a one-sample, one-sided t-test on the observed mean return to see if we can reject the null hypothesis that the actual mean return from the signal is zero. Since the p-value (.074) is greater than α (α=0.05 normally and in this case), this means that the null hypothesis is not rejected so our result is not statistically significant.