

# Assignment 5: Realized Volatility

Due: Nov 3th, 2015 at 9:59 am

## Question 1: Read CSV File and Calculate the Realized Volatility

The data you downloaded is the minute data for Morgan Stanley since January 2006. All you need to do is calculate the realized volatility for each day and make a plot. Before your calculation, you first need to clean the data.

Please complete the following:

- Recall that we had a lecture about how to deal with date and time in R. All date and time manipulations has to be either in one of these three built-in classes: Date, POSIXct, POSIXlt; or you can use package lubridate.
- For each day, make a time window between 11:00 am and 2:30 pm. Please pay attention that some rows may be missing, so the exact time for someday may not exist in this data.
- Calculate the realized volatility ONLY with rows inside the time window.
- Make a plot of realized volatilities. Not that one day will only generate ONE number as the realized volatility, so number of elements in your vector to be plotted should be the same as number of days in that data file.
- Bonus Question(10%): You will get bonus if you use package *ggplot2* for the graph.