**FINN 6216 Homework Assignment #3**

**Same rules as always.**

For all of these problems, we use the same inputs we introduced in homework 1.

1. *Quick and dirty t distribution fitting*. Create a 2-dimensional t distribution such that the kurtosis of is midway between the sample kurtoses of the absolute shifts of AAPL and SPY. Make sure the overall covariance matrix matches your sample covariance. Now simulate this distribution 5000 times and compute 99% VaR of your position using full revaluation. Now try this 2 times more, with your parameter set (a) 1 higher and (b) 1 lower than for the first calculation, but with the same covariance matrix and means. Which of these three models has the best fit for the data?
2. *The E-M algorithm, simplified version.* Using the simplified E-M algorithm we discussed in class for the t distribution, arrive at a fitted t distribution for the data for Does it fit better than the models you created in (1)? Now plug this model into the simulator you built in (1) and once again, compute the 99% VaR.
3. *Bonus Problem, Extra Points!* Do problem (2), but use the full E-M algorithm for the generalized hyperbolic distribution. You will also need to build a simulator for GIG and GH. This problem is too much work for a standard homework assignment, and I will accept it past the normal deadline if you wish to try it.

**This assignment is due Thursday, February 8. If you have written notes as part of your submission, you may either write these down on paper and hand it to me in class, or you may scan it or create an electronic document in the format of your choice (Word, LaTeX and LyX are okay), and email it to me, along with spreadsheets or anything else you have. If you do that you must do it before the class starts.**