**FINN 6216 Homework Assignment #2**

**Same rules as 1. However, please do not use functions in Matlab (or any other software) that already do the whole problem. For example, the Jarque-Bera test (problem 1) may already be built into a lot of packages.**

For all of these problems, we use the same input data for AAPL and SPY that we used for Homework 1.

1. Using the Jarque-Bera test, tell me whether you think the last two years’ daily stock price changes are normal for both AAPL and SPY. Do the same for the log returns. I need to see the exact calculation that shows that it is not normal, or that it might be.
2. Compute 99% VaR analytically using a joint normal assumption and a Variance-Covariance estimate. Use absolute shifts.
3. Using “Beginner VaR” with joint normal assumption on absolute shifts, do a 5000-scenario Monte Carlo 99% VaR with full revaluation.
4. Suppose you have a single position of 400 units of the AAPL option, but this time there are no SPY shares, and the option is a 1-year *in the money knockout call option,* with the same strike of 170, but also with an upward knockout level, or “barrier”, of 183. That means the option’s value goes immediately to 0 if the stock price ever hits 183. The price function of such an option is well known to drop off sharply as the stock price approaches the barrier. I give the analytical formula for this type of option in a special file you can find on Canvas. Show by means of a couple of examples how both the Delta/Gamma 1-day P&L and the Grid P&L (and possibly the VaR as well) can be way off from full revaluation for this type of option.

**This assignment is due Thursday, February 1. 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.**