ANLY 515 Risk Modeling
Homework 3 (100 points)
Remember to upload your answers by the due date. There will be a penalty of 10 points for each day the homework is late.

- The homework report must include all charts and answers required.
    - Include the questions and the answers, code on a separate file
    - Upload 2 pdf files (answers, code)
- A file with the R code you developed must be included as an appendix. Please label each section of the code based on the question that you are answering. For example the code to download and create the subsets should be under "Create the data files".

Students should have a five-year portfolio. The calculations for this homework will be based on the data from the fourth year of your portfolio.

Part A – Risks

1. Using two securities from your portfolio (from different sectors)
    a) Construct a variance-covariance matrix

Part B – Suitable distributions for returns

1. Fit the data using GHD, HYP and NIG
2. Plot the combined density functions
3. Create a Q-Q plot
4. Make a model recommendation using lik.ratio.test
5. Calculate and plot the VaR (using all models)
6. Calculate and plot the ES (using all models)