ANLY 515 Risk Modeling
Homework 1 (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.
    - 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".

Create the data files

Based on the information from lecture 1 (download, xts class, column names, etc) develop a dataset using the following guidelines

- Select two market sectors from the 11 sectors identified on this reference
    - https://www.bloomberg.com/markets/sectors
- Select two stocks from each sector (stocks)
- Add one of these sectors (if not selected already) and select two additional stocks from the additional sector
    - Real Estate
    - Consumer Discretionary
    - Communication Services
    - Health Care
- Based on the criteria above, the portfolio should include three sectors and two stocks per sector for a total of six stocks.
- For each stock
    - Download the historical file from yahoo finance
        - The time interval should be starting from the first day of the month and year when you turned 15 years old and end five years later.
            - For example, I turned 15 in January of 1989. My data will be from 01/01/1989 to 01/01/1994 (understanding the markets are closed on January 1st)

Plot the data for each security to check for missing data

- Confirm that there is no missing data
- Check the dimensions to verify that the data covers 5 years

Plot candlestick charts for one stock from each sector

- Use weekly data

Develop a plot comparing the capital gains by sector (not by stock, there should be 3 lines)

- Use a data subset (third year of your data only)
- Use different colors for each sector
- Include an abline

Using one of the sectors

- Calculate the Rolling 50-Day and 200-Day Average Price
- Subset to the fifth year of the data
- Plot the simple moving average

Bollinger Bands Plot

- Create a chart for the value of the portfolio
- Use the entire data set (five years)