**STA 6329 – Assignment 3 – Due Monday 9/30**

**Text Book Problems:**

Chapter 5: 1,2,3 Chapter 6: 1,2,3

**Other Problems:**

1. Download the Asian city monthly weather dataset.
   1. Compute the mean and variance of temperature across all cities and months.
   2. Compute the mean and variance of temperature by city.
   3. Compute the mean and variance of temperature by month.
   4. Obtain a single plot that has temperature (Y) versus month (X), with separate lines/points by city
   5. Obtain a grid of plots of temperature (Y) versus month (X) with 1 plot per city
   6. Create a matrix from the data frame and call it **F** with rows as cities and columns as months, which is the transpose of its form in the EXCEL file. (No need to print this part out).
   7. Obtain the variance-covariance matrix **S** = (1/(n-1)) **F**’(**I** – (1/n)**J**)**F.** Note that the diagonal elements should be the monthly variances (across cities), confirm this with part c).
   8. Compute the trace of **S**.
   9. Transform the matrix **F** to Celsius and call the new matrix **C**.
   10. Compute the trace of **C**’**C** two ways:
       1. summing its diagonal elements
       2. taking the sum of squared elements of the matrix **C**
   11. Obtain the QR decomposition of **F** and confirm that **QR**=**F**.