Assignment#1

Consider the following univariate and multivariate control charts:

- $\bar{X}$, R, S, S^2 charts
- Chi-Square, Hotelling T^2, Generalized variance based charts
- X (individual), MR (moving range) and MA(moving average) charts

Write the pivotal quantities used in each of the above mentioned charts. Provide the derivations of their sampling distributions (preferably exact otherwise some approximations based), followed by their means and variances/st.devs. Consider all the general and special cases in your work.

Assignment#2

List down different methods of computing average run length (ARL) for memory-less (Shewhart) and memory (EWMA and CUSUM) control charts. Illustrate the complete algorithm of your listed methods and briefly discuss the limitations of each.

Assignment#3

Give a detailed description of Shewhart, EWMA and CUSUM control charts in univariate and multivariate setups and provide a comparative analysis among these charts.

Expected Time for Submission: April 07, 2015.