SIE606 Advanced Quality Engineering
Homework 4
Due: Thursday, May 03, 2018, 9:15AM

Problem 1:

You are given a set of multivariate data (available at the course website). There are a total of ten variables and 300 records. The first 200 data records should be used as historical data for the purpose of establishing the control limits. Then a control chart will be used to do detection on data records #201 - #300.

(1) In this problem, please use PCA to perform a dimension reduction first before choosing a detection method. You need to deicide how many PCs you will retain and then choose either a T^2 or an individual X chart (depending on the dimension of the reduced data) to perform a detection mission. Please show necessary computation and plots to justify your choices. Also show the final control chart and discuss what you observe. When turning in your homework, please remember including the computer code.

(2) Setup a T^2 chart for the original ten variables. Show your T^2 chart and compare it with the results in (1). What do you observe and can you elaborate your finding?