DATA624 Homework 1 - Week 4

Esteban Aramayo, Coffy Andrews-Guo, LeTicia Cancel, Joseph Connolly, Ian Costello

6/26/2022

Table of Contents

# Week 4

## KJ 6.3

*A chemical manufacturing process for a pharmaceutical product was discussed in Sec. 1.4. In this problem, the objective is to understand the relationship between biological measurements of the raw materials (predictors), measurements of the manufacturing process (predictors), and the response of product yield. Biological predictors cannot be changed but can be used to assess the quality of the raw material before processing. On the other hand, manufacturing process predictors can be changed in the manufacturing process. Improving product yield by 1% will boost revenue by approximately one hundred thousand dollars per batch ($100,000/batch):*

### (a)

*Start R and use these commands to load the data:*

*The matrix processPredictors contains the 57 predictors (12 describing the input of biological material and 45 describing the process predictors) for the 176 manufacturing runs. yield contains the percent yield for each run.*

library(AppliedPredictiveModeling)  
data(ChemicalManufacturingProcess)

### b. A small percentage of cells in the