Homework 4

STAT 697STA Spring 2023

Due March 8, 2023, 9:40am on Gradescope

1 Reading

- Read the rest of Chapter 2 of the text.

2 Questions

1. HRW 2.4

   Note: for part (c), you can find the location of the demo code using the command at the end of section 2.12.2 on page 57. You may want to create a more accessible folder for all these demo code files that we will use later in the course as well.

2. HRW 2.8

   For part (b), you may exclude $N = 25$.

   For part (e), the following code may be helpful:

   ```
   library(reshape2)
   library(ggplot2)
   library(tidyverse)

   dimnames(b_out)[[3]]<-c("GCV","REML")
   dimnames(b_out)[[2]]<-nlist
   b_tidy<-data.frame(melt(b_out))
   names(b_tidy)<- c("rep","N","type", "ASE")
   b_tidy<-b_tidy %>% mutate(N=as.factor(N))
   ggplot(b_tidy, aes(x=N, y=ASE, fill=type)) + geom_boxplot()
   ```

3. We have discussed 3 methods of fitting penalized spline models: (1) GCV/Ridge Regression, (2) Mixed Models, (3) Bayesian.

   (a) List 1-2 strengths and 1-2 weaknesses of each of these methods.

   (b) For each of the 3 methods, list one special case in which it might be better to use that method.