## Homework 2 Stat 550

Dr. Scott

September 7, 2023

## Due: Friday 9/15 50 Points

**Instructions:** We will discuss generally in class before due date. You can work in groups, but turn in your own solutions.

Where to look: Some files will be on Canvas, most will be on my own web site: http://www.stat.rice.edu/~scottdw/stat550/.

Where to turn in: Canvas upload.

## 1–2 Problems to Work in Chapter 1: 1, 3.

## 3-4 Problems to Work in Chapter 2: 8, 10.

- 5 A wise former chairperson of the Mathematical Sciences Department once advised that dimensional analysis was much overlooked as an important activity. Suppose the unit of our random variable, X, is in meters (m). Given a random sample,  $\{x_1, x_2, \ldots, x_n\}$ , modeled by any continuous pdf,  $f_X(x|\theta)$ , what are the units (dimensions) of the pdf? For example, the pdf might be negative exponential, in which case  $\theta \in \Re^1$ . If the pdf is Normal, then  $\theta \in \Re^2$ . What are the units of the mean, variance, and standard deviation?
- Bonus Try to correctly compute the exact MISE for the parametric estimator  $\phi(x|0, S^2)$ , where  $S^2$  is the unbiased estimator of the variance. How can you be sure your answer is correct?