STAT 5380 Hwk 7

1. Ch. 4 TPE: Problem 7.5.
2. Ch. 5 TPE: Problem 1.9.
3. Ch. 5 TPE: Problem 1.13.
4. Ch. 5 TPE: Problem 1.25.
5. Ch. 5 TPE: Problem 4.3.
6. Suppose that $\{X_1, \ldots, X_s\}$ are independent with $X_i \sim N(\theta_i, 1)$, and let $\boldsymbol{X} = (X_1, \ldots, X_s)'$ and $\boldsymbol{\theta} = (\theta_1, \ldots, \theta_s)'$. For known $0 < \tau^2 < \infty$, and under the usual squared error loss function

$$L(\boldsymbol{\theta}, \boldsymbol{d}) = \sum_{i=1}^{s} (\theta_i - d_i)^2,$$

define the following estimators of $\boldsymbol{\theta}$:

$$T_1(\boldsymbol{X}) = \boldsymbol{X}, \qquad T_2(\boldsymbol{X}) = \frac{\tau^2}{1+\tau^2}\boldsymbol{X}.$$

Note that by Remark 4.4.5 of notes, we know that T_1 is not admissible.

(a) Show that T_2 is admissible.

(b) Show that T_1 is minimax. [Hint: Theorem 4.2.8 of notes with $\Lambda_n \sim$ iid $N(0, n)$.]