

**STA 200B Homework 9**  
**Due: Wednesday, March 11, in class**

**Reading:** 8.5

**Problems:**

Section 8.5: 4, 6

Section 8.9: 6, 8, 10, 12, 14

Additional Problems:

1. Consider an i.i.d. sample from  $\text{Uniform}(0, \theta)$ ,  $\theta > 0$  of size  $n$ . Determine the dependency of the MSE of the estimator  $2\bar{X}$  on the sample size  $n$ . Is this estimator consistent for  $\theta$ ?
2. Show that the choice  $\gamma_1 = (1 - \gamma)/2$ ,  $\gamma_2 = (1 + \gamma)/2$  gives the shortest length interval in (b) p.51 of the lecture notes, and therefore this is the best choice.
3. Consider an i.i.d. sample from  $\text{Uniform}(-\theta, \theta)$ ,  $\theta > 0$ , of size  $n$ . Show that the estimator  $\sqrt{X_{(1)}X_{(n)}}$  is consistent for  $\theta$ .