M338, Mathematical Statistics
Homework

DATE	Homework
Dec 1	Sect 8.1-8.2: 8.5*, 7*, 9*, 16, 17, 63, 67, 71 Read 8.3
Dec 3	Sect 8.4-8.5: 8.18, 19, 22-24, 28, 77, 31, 33*, 79
Dec 5	Finish Ch 8, begin Ch 10
Dec 8	Sections 10.2, 10.7, 10.8: 10.2, 5, 7, 14, 50, 59, 62
Dec 10	Continue with Ch 10, Begin Ch 11.1-2: 11.1, 6, 20, 21, 29, 31
Dec 12	Catch up/Review

Final Exam: Currently scheduled for 9-11AM, Wed, Dec 17th.

*-Hints for the homework:

8.5 Might change the set up to: $X_1, \ldots, X_{n_1}$, then $Y_1, \ldots, Y_{n_2}$, wehre n_1 of the Bernoulli trials use parameter θ_1, and the rest use θ_2.

8.7
- You might look at the distribution first to get a feeling for what it is.
- Show that the mean of each X_i is zero.
- Show that the variance of each X_i can be written as:

$$1 - \left(\frac{1}{2}\right)^{i-1} + \left(\frac{1}{4}\right)^{i}$$

- Show that the variance of Y_n can be written as

$$n - 2 + \frac{1}{3} + A_n$$

where $A_n \to 0$ as $n \to \infty$.

8.9
- Show that $E(|X_i - \mu_i|^3) = \left(1 - \left(\frac{1}{2}\right)^{i}\right)^{3}$
- Find A so that:

$$[\mathrm{var}(Y_n)]^{-3/2} \sum_{i=1}^{n} c_i = \frac{\sum_{i=1}^{n} A^3}{\left(\sum_{i=1}^{n} A^2\right)^{3/2}}$$

You may assume that this fraction has the form:

$$\frac{n + \text{Terms go to zero as } n \to \infty}{\left(n + \text{Terms go to zero as } n \to \infty\right)^{3/2}}$$

(And therefore, the CLT holds).