STAT 665 - Assignment 2 - due date is on course outline

From Chapter 3:

1. Prove Lemma 3.1.1 (p. 138) directly, by using the characteristic function formulation of convergence in law.

2. 1.10

3. 1.20

4. Recall the Wilcoxon 1-sample test. Let $X_1, ..., X_n$ be a sample from $F(x-\xi)$, continuous and symmetric about ξ. To test $\xi = 0$ vs. $\xi > 0$ we can rank the $|X_i|$, let $S_1 < ... < S_{N_+}$ be the ranks arising from *positive* Xs, and reject if $S = \sum S_j$ is too large. Show that $S = \sum_{i \leq j} I(X_i + X_j > 0)$. [See Example 3.2.5; S is V_s in that example.].

5. 4.19

6. 5.4 [Note that Example 2.4.4 claims that the asymptotic variance of S^2 depends on the value of $\tau^2 = VAR[X^2]$, but that the assumption is made - and not stated until later - that the mean is zero. Thus $VAR[X^2]$ should be replaced by $VAR\left[(X-\xi)^2\right]$. This error is continued throughout the book, wherever the asymptotic distribution of the sample variance is discussed.]

From Chapter 4:

7. 1.12

8. 1.13 Replace each c/n by c/n^2 and $\gamma = e^{-c_1} - e^{-c_2}$ by $e^{-c_2} - e^{-c_1}$.

9. 2.6

10. 3.5

11. 4.1

From Chapter 5:

12. 2.8

13. 4.8 (i) [Hint: Ignore the hint.]

14. 4.8 (ii) [See §5.2 in the text and note the difference between a *joint* confidence region and a *simultaneous* confidence region - a *simultaneous* confidence set for two parameters is a rectangle with coverage probability $1-\alpha$; then each projection on a coordinate axis is a confidence interval and, prior to sampling, the probability that both intervals will be correct is $1-\alpha$.]

15. 6.6 (ii)