1. Homework problem #6 Chapter 4: The variance of a random variable has to be greater than or equal to zero. It equals zero if and only if the random variable is a constant with probability 1. The kurtosis of a random variable X is often defined as

$$ \frac{E(X - \mu)^4}{\sigma^4} - 3 $$

It is a measure of the likelihood of outliers for the random variable X. In general, the bigger the kurtosis is, the more likely outliers will occur. Show that the Bernoulli defined as taking the values 0 and 1 with probability 1/2 has minimum kurtosis. (Hint: What is the variance of \((2X - 1)^2\)?)

2. Page 75 middle about line 14, mean 0 (wrongly listed as 1).

3. Last line of page 120: \(t_{n-1,\alpha/2}\) should be \(t_{n-1,1-\alpha/2}\).

4. Line 8 from the bottom of page 159: \(0, -\left(\frac{\alpha}{2}\right)^{1/n}\) should be \(0, \left(\frac{\alpha}{2}\right)^{1/n}\).

5. Equation 9.7 on page 161: \(\sum_{|x-np_0| \leq np_0 - \alpha / 2} \binom{n}{x} p^x (1 - p)^{n-x}\) should be \(\sum_{|x-np_0| \leq np_0 - \alpha / 2} \binom{n}{x} p_0^x (1 - p_0)^{n-x}\).

6. On page 194-195: The RDD confidence intervals using normal quantiles are for large sample sizes. They should use t distribution quantiles if the degrees of freedom are less than 30. The degrees of freedom calculations are beyond the desired level of the textbook. Readers interested in doing the small sample size calculations should see F.E. Satterthwaite, An approximate distribution of estimates of variance components, Biometrics Bulletin, 2 (1946) 110-114.