Comments on and Errata for BIOS 662 Slides
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- Populations and Samples, Slide 37. Chebyshev's inequality should be

$$\Pr\left[\mu - K\sigma < Y < \mu + K\sigma\right] \geq 1 - \frac{1}{K^2}$$

  E.g., if $K = 2$, then

$$\Pr\left[\mu - 2\sigma < Y < \mu + 2\sigma\right] \geq 0.75$$

- Point and Interval Estimation, Slide 42. Change $(y_{(7)}, y_{(17)})$ to $(x_{(7)}, x_{(17)})$.
- Point and Interval Estimation, Slide 45. Change $Z_{(r)}$ to $X_{(r)}$ twice.
- Point and Interval Estimation, Slide 46. Change $Z_{(r)}$ to $X_{(r)}$.
- Point and Interval Estimation, Slide 48. Change $(y_{(40)}, y_{(61)})$ to $(x_{(40)}, x_{(61)})$.
- Two Sample Tests, Part II, Slide 36. In class, we noted that the p-value for the two-sided permutation test was

$$p = \Pr[D \leq -15.75] + \Pr[D \geq 15.75] = 0.057 + 0.029 = 0.086.$$

  This seems to contradict the result on the Slide 36 that we fail to reject at the $\alpha = 0.1$ level of significance. The discrepancy arises from using a symmetric critical region. Recall the critical region $C_{.1} = \{D : D = -15.75 \text{ or } D = 20.42\}$ was constructed so that the probability of being in each tail of the critical region was no more than 0.05, i.e., $\Pr[D \leq -15.75|H_0] \leq 0.05$ and $\Pr[D \geq 20.42|H_0] \leq 0.05$. More generally, we can write a symmetric critical region as $C_\alpha = \{D : D \leq d^L_{\alpha/2} \text{ or } D \geq d^U_{\alpha/2}\}$ where $d^L_{\alpha/2}$ is the largest real number such that $\Pr[D \leq d^L_{\alpha/2}|H_0] \leq 0.05$ and $d^U_{\alpha/2}$ is the smallest real number such that $\Pr[D \geq d^U_{\alpha/2}|H_0] \leq 0.05$. Alternatively, we could define a critical region $C_\alpha = \{D : |D| \geq d_\alpha\}$ by the smallest d_α such that

$$\Pr[|D| \geq d_\alpha|H_0] \leq \alpha.$$

  This approach is valid since the type I error of the test does not exceed α. Note the critical region is not necessarily symmetric in the sense that probability of being in one of the tails of the critical region may exceed $\alpha/2$. Moreover, because we do not insist on symmetry, this approach can be more powerful than employing a symmetric critical region. Using this approach applied to the problem in the notes, we get

$$C_{.1} = \{D : |D| \geq 15.75] = \{D : D \in \{-17.5, -15.75, 20.42\}\},$$

such that we would reject at the $\alpha = .1$ level of significance, i.e., we now get a result consistent with the p-value of 0.086.

- Counting Data, Slide 57. Change p_1 to ρ_1 three times. Change p_2 to ρ_2 three times.
- Counting Data, Slide 58, first bullet. Change "is" to "in".
- Poisson, Slide 10. First bullet. Change "of" to "we".
- Regression II, Slide 12. Change $i = 2, \ldots, n_2$ to $i = 1, \ldots, n_2$.
- Regression II, Slide 44. Change "k meansures" to "k independent measures".
- ANOVA II, Slide 17. Note the multiplicity adjusted CIs are assuming a balanced design, i.e., $n_i = n$ for all i.
- ANOVA II, Slide 24. Change $N - k$ to $N - K$.
- ANOVA III, Slide 9. Change "less than" to "less than or equal to".
- ANOVA III, Slide 14.The Box-Cox transformation can also be conducted using Proc Transreg in SAS.
- ANOVA III, Slide 25. Change $R_1 = 63$ to $R_{1\cdot} = 63$, $R_2 = 32$ to $R_{2\cdot} = 32$, and $R_3 = 25$ to $R_{3\cdot} = 25$.
- Power and Sample Size III, Slide 3. Change alternative to $H_A : \mu_1 - \mu_2 = \delta_A > 0$.
- Rates and Proportions, Slide 28. Change V to $\hat{V}$ four times.