One last topic in Ch.4, then Ch. 5 Notes Worksheet

Ch.4 - Permutation / Randomization Tests -

Nonparametric based procedures that can be used in some situations where usual conditions for parametric inference fail.

1. Choose a statistic of interest.
2. Use permutation to obtain values of the stat that would be expected under H_0. That is, generate an empirical _____ _____ distribution.
3. Assess how unusual your observed stat is in the distribution. If it is unusual, then what?

Differs from the nonparametric bootstrap. Describe the diff. in your own words. (What values of the stat would the bootstrap generate?)

Ch. 5

5.1 Reviews common densities.

When might you use a Gamma over a Normal model for a variable?

What about a Poisson as opposed to Binomial?

5.2 Multivariate Normal

$$\mu = \begin{bmatrix} E(X_1) \\ E(X_2) \\ \vdots \\ E(X_p) \end{bmatrix} \qquad \Sigma = \text{covariance matrix} = \begin{bmatrix} \sigma_{11}^2 & \sigma_{12}^2 & \cdots & \\ \sigma_{21}^2 & \sigma_{22}^2 & & \\ \vdots & & \ddots & \\ & & & \sigma_{pp}^2 \end{bmatrix}$$

$$\sigma_{ii}^2 = \text{Var}(X_i)$$

$$\sigma_{ij}^2 = \text{Cov}(X_i, X_j)$$

Has some neat results and properties.

Name <u>one</u>.

5.3 Key result: The variance of the MLE must always _____ in the presence of nuisance parameters.

(This is why we have issues when estimating many parameters with their MLEs @ once.)

5.4 Multinomial Dist.

- extension of Binomial to k categories ($k > 2$)
- neat relationship with _____ dist.

5.5 Exponential Families

Describes a general family construction of densities related by an exponential tilt.

Many dists. you know are in the exponential family (see practice problems).