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Eco 602 – Week 13 and 14 Reading Questions

Week 13 Questions

**Q1.** In Chapter 7, McGarigal writes: “The squared measure of deviation has an accelerating penalty: a deviation that is twice as large contributes four times as much to the sums of squares. There is no a priori reason to choose such a measure.”

Propose a possible alternative measure of deviation. Briefly describe how your measure of deviation could affect the parameter estimates. You may want to consider things such as:

Does your measure of deviation penalize large deviations more or less than squaring? What is the effect of large deviations? And The sign of the individual deviations.

Other measure of deviation? Variance?

**Q2.** In Chapter 6, McGarigal writes: “With the bootstrap, the original data structure is maintained; that is, the individual observation vectors are left intact.” How is the original data structure maintained in a bootstrap resampling?

In bootstrap resampling, the original data structure is maintained because whole rows of the data are sampled at once, not individual values. For instance, a1, b1, and c1 would be kept together in one iteration, whereas in Monte Carlo resampling you could see one iteration as a1, b4, and c3. Bootstrap resampling is typically used to examine the alternative hypothesis of the data and to see if when resampled, there is stronger evidence for associations present in the data

**Q3.** With the Monte Carlo randomization procedure, the original data structure is destroyed by randomly shuffling some of the data. How does a Monte Carlo Randomization destroy the structure of the data?

In Monte Carlo resampling, the original data structure is destroyed because whole rows of data are not kept together. For example one column value of a row could be shuffled in a resampling to be with another column from a different row. For example, a2 could be shuffled with b6, and c1 (instead of a1, b1, and c1.) Monte Carlo resampling is used to construct a potential null distribution (as if there were no associations present in the data.

Week 14 Questions

**Q1.** Consider the various types of models and data transformations from the readings and lecture notes. Name two possible solutions to deal with heterogeneity, i.e. non-constant variance, in your data.

Log transformations (take the log of your data – often makes the data more statistically powerful, but can make it harder for your audience to interpret the data)

Random Effects models (we could allow for the heterogeneity in our analysis and produce a much wider confidence interval, using what is called a random effects model)

**Q2.** Recall the constellation of methods and the types of response variables that each can accommodate.

Which of the following model types could use for a study that aims to predict bird presence/absence by percentage of old growth forest? Select the correct answer(s):

1. **Simple linear regression**
2. **Poisson regression**
3. **Logistic regression**
4. 1-way Analysis of Variance
5. None

**Q3.** Which of the following model types could use for a study that aims to predict bird abundance by shrub diversity? Select the correct answer(s):

1. **Simple linear regression**
2. Poisson regression
3. Logistic regression
4. Binomial regression
5. 1-way Analysis of Variance
6. None

Consider all the possible ways in which you could measure bird abundance.

Poisson often used to model count data

Logistic used for binary dependent variable (present/absent)

\*I worked independently on this assignment