

## **EPSY 8320**

### **Final Examination – Due Thursday, December 13<sup>rd</sup> at 11:59:59 PM**

This final consists of two problems:

1. Data analysis of Albuquerque Home Prices data set.
2. Critique of peer-reviewed journal article's statistical methods section.

The data set is the result of a study conducted by various investigators that are described on the following pages. Along with a description of each study you will find a set of questions posed by each of the investigators prior to collecting the data. These questions are not directly statistical in nature, in that they do not ask for specific analyses to be run. They are, however, the questions that drove the research, and resulted in the data that were collected. Each question can be answered using statistical tools taught in this course up to this point. *Note that there is not necessarily a single best way to answer each question.* Furthermore, note that this final is the statistical equivalent to an essay test, with answers evaluated not only for technical correctness, but also for the motivating reasons for using the statistical methodology – so describe the motivation for your choice of analysis fully. Your job, for each part of the final, is to present an answer to each question in the form of an argument that is supported with evidence culled from the statistical analyses. In your mind, consider me as either a journal editor evaluating a manuscript or as a reviewer of a technical report.

#### **Directions:**

Your job is to answer the questions given for each data set using statistical techniques you have learned in this class. For **each part of each** question:

- Describe the analysis you have selected to perform (for example, explain why you are using the variables you are using).
- Describe the assumptions of the analysis.
- Report any diagnostic tests of assumptions you may have run.
- Perform the analysis and report the results. Supplying graphs can be helpful to describe your findings.
- Interpret the results.
- Provide an answer to the question using the statistical evidence you have gained via the analysis.
- Describe any limitations of the analysis you performed.
- Remember: direct tabular output from SPSS is not allowed (and will lead to zero points on that section of the analysis); however graphs and figures are encouraged.
- NOTE: Because of logistics, please post your questions to WebCT's discussion board rather than email them to me – this will help others and will allow for communication to flow easier while I am away.

#### **Scoring:**

Each data set will represent 1/2 of the total score for the final. For question in the midterm, your score will depend upon these factors:

- Did you choose an analysis that will provide an accurate answer to the question? (10 points)
- Did you explicitly state all assumptions? (10 points)
- Did you perform the appropriate analysis correctly? (20 points)
- Did you check the assumptions? (20 points)
- Were your interpretations consistent with the information the analysis provides? (30 points)
- Were your conclusions well explained (how well did you use the statistical evidence to create an answer to the question)? (10 points)
- BONUS: One percentage point per WebCT discussion post: either a question or an answer (up to 5% of your total grade).

## Problem #1

### Albuquerque House Price Data

How taxes change in response to changing market value of homes is a question of concern to citizens as a policy matter as well as a personal financial concern. The tax data included in the datafile Home Prices permit an examination of this question for used homes in Albuquerque in 1993.

Variable Name	Description
PRICE	Selling price (in hundreds of dollars)
SQFT	Square feet of living space
AGE	Age of home (years)
FEATS	Number out of 11 features (dishwasher, refrigerator, microwave, disposer, washer, intercom, skylight(s), compactor, dryer, handicap fit, cable TV access)
NORTHEAST	Located in northeast sector of city (1) or not (0)
CUST	House has custom features (1) or not (0)
COR	Corner location (1) or not (0)
TAX	Annual taxes (in dollars)

Policy decision makers in Albuquerque want to know:

- What variables best predict the annual taxes of a home?
- When controlling for age and square footage of a home, was there a significant interaction between location of the home (northeast or not) and the home being on a corner lot?
- Does taking the log of price, square feet, and tax change the conclusions drawn in part A?

Please limit the text of your answer to 10 double-spaced pages or less. Place all tables and figures (if any) following the text. Please do not give SPSS output tables only.

## **Problem #2**

### **Critique of a Published Journal Article's Statistical Methods**

For this problem, select an article from a peer-reviewed journal that you are familiar with (something from your field of study). Be sure to select an article that uses statistical methodology taught in this course. Provide a critique of the statistical methods used in the article. Your response should address the following:

- The full citation for the article (i.e., journal, author(s), title, etc...)
- The empirical research question being investigated by the article.
- A brief description of the research design/data collection methods.
- A description of the statistical methods used to analyze the data (and the assumptions underlying the methods).
- The conclusions drawn as a result of the statistical analyses.
- Your opinion of whether or not the statistical results provided justification for the conclusions drawn by the authors.
- Your opinion of the appropriateness of the statistical methods used in the article.
- What you would change about the analysis and/or conclusions.
- What relevant statistical information was omitted?
- What included statistical information was superfluous?

Please limit the text of your answer to 10 double-spaced pages or less. Place all tables and figures (if any) following the text.