**Introduction to Statistics Research Paper**

Students are expected to complete an empirical paper demonstrating an understanding and application of the statistical tools covered in this course. The paper should be approximately 3 pages, double-spaced with 11 or 12 point font. The paper is due **Wednesday, December 6**.

Four excel files are posted on Canvas in the Data subfolder in the Research Paper folder. The student should choose one of the datasets and form a hypothesis (or hypotheses) based on the variables contained in the chosen dataset. The student should fully describe the pertinent data and perform statistical analysis. This statistical analysis should speak to the research question (hypothesis) the student has chosen.

The topic choice is up to the student given the supplied data, but the paper must contain the following sections:

1. Introduction
2. Data description
3. Statistical analysis
4. Conclusion

**Introduction**

This section should set up the topic/question of the paper and what statistical tools the student will use in the body of the paper. Examples of topics include:

- Do borrowers with lower income have more debt than those with higher incomes?
- What is the relationship between GDP and birth rates?
- Do European countries have higher or lower birthrates than countries elsewhere in the world?
- Is there a relationship between team batting average and winning percentage?
- Do schools with higher tuition have high enrollments as well?

Appropriate research questions will become clear as we progress through the course. I will also suggest additional topics throughout the beginning of the semester. The research question must be submitted to me by **Friday, September 29th**, via Canvas using the form posted in the Research Paper folder on Canvas. On this form students will need to indicate which dataset they are using, what the research question is, which variables they will use and why the question is interesting. I will approve the topic or give the student suggestions for similar topics that fit the assignment objectives via assignment feedback in Canvas.

**Data Description**

This section should begin with a thorough verbal description of the data written in your own words. You should pick 3-6 variables from the dataset for this portion of the paper and discuss how they relate to your research question. This discussion should also include the source of the data and description/definitions of the variables of interest.
Students should report the usual descriptive statistics for all variables in a properly labeled table in this section. The descriptive statistics should also be interpreted in a meaningful way. Is there anything particularly interesting about these statistics? Is the standard deviation larger or smaller than the mean? Loosely describe the distribution of the data. Mention if there are missing observations or outliers.

In this section, students should also provide at least one graphical representation of the data. This can be a histogram, pie chart, Pareto graph, etc. There should be a brief discussion of the graph. What does it show us? Why is it interesting?

**Statistical Analysis**

In this section, students must perform at least two distinct analyses. The two separate analyses can be statistical tests and/or metrics calculations (eg. correlation coefficient). At least one hypothesis test must be performed. For statistical tests, students must provide the correct inference. If the student calculates a confidence interval they also need to correctly interpret the interval. For correlation coefficients, students should describe the correlation and its implications. In this section students may also want to touch on any potential problems with the analysis or aspects of the data that make analysis difficult.

**Conclusion**

This section of the paper should restate the topic, the data used to address the research question and the main statistical results. It should also include a sentence or two about further questions that could be addressed under the topic.

**Other Notes & Requirements**

- The first page should be a title page with a succinct title, student’s full name and course number (including section number).
- Include last name and a page number on each page.
- The pages should be stapled and in chronological order.
- Please use APA format for any citations.
- Use full sentences, complete paragraphs and proper grammar. Students will be graded on the quality of their writing.