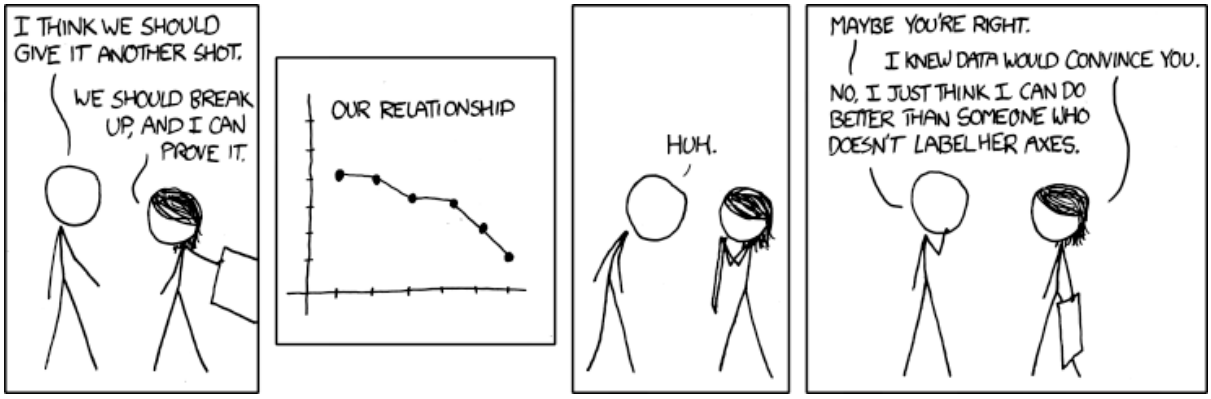
STAT 3400

Applied Regression

Final Project Description



About the Project

You are expected to either (1) conduct a thorough analysis of a data set using statistical modeling techniques, (2) use statistical methodology to gain insights into some theory, or (3) explain and apply some (nontrivial) statistical method that we have not discussed in class (e.g., Bayesian linear regression, kriging). You may work in small groups if you wish. I hope that you choose a data set or problem based on your interests, rather than just "going through the motions". You will be expected to describe your results in a short **formal paper** and give a **poster presentation** at the end of the semester (due dates to come). The project grade will be determined on the basis of the accuracy of the statistical analysis and the quality of the paper/poster.

Grading Procedure

The project grade will be determined on the basis of the quality of the statistical analysis, paper, and presentation. The project will be graded out of **one-hundred points**. A specific rubric follows:

Fifteen points will be related to oral communication.

Thirty points will be related to written communication. You will receive a grade of 0-6 in each of the following categories: context and purpose of writing, content development, genre and disciplinary conventions, sources and evidence, control of syntax and mechanics.

Seventy points will be related to problem solving. You will receive a grade between 0-10 on how well you define the problem/question of interest. You will receive a grade between 0-10 on how well you propose solutions to answer the questions. You will receive a grade between 0-30 on implementing solutions to answer the question of interest. This is the proper application of statistical methods to the problem at hand. You will receive a grade between 0-20 on how well you evaluate outcomes, explain conclusions, interpret results, etc.

Proposal

Sections and Topics for Data Analysis Paper

I suggest that you include the following sections and topics in your paper and presentation. If you are not analyzing a specific data set (e.g., if you are explaining a modeling method, you should be able to adjust these sections accordingly):

1. **Introduction/Background**
   - Why are you interested in this problem?
   - What do people need to know to understand? Assume that your audience is not an expert in the application field.
   - Is there any prior research on your topic that might be helpful for the audience?
   - From where did the data come? Is this an experiment or observational study? Who collected the data? Why was the data collected (if you weren't the one doing the collecting)?
   - What are the questions of interest that you hope to answer?
2. **Methods/Results** (experimental design and data collection)
   - How did you obtain the data?
   - Summarize and explore the data. Are any transformations needed? Graphics would be appropriate here.
   - What analyses are most appropriate to answer the question of interest?
   - Describe the analyses used. Check assumptions!
   - Present relevant graphics and interpret results.
3. **Conclusions**
   - What are your conclusions? What did you learn?
   - What would you do to improve the design of your study/experiment?
   - How would you extend this research? What future research ideas comes to mind based on your results and experience with this analysis?

I want you to start thinking of a data set or problem that you would like to work on for your final project relatively early. If you are choosing a data analysis project, here are some of the questions that I want you to consider for your proposal:

1. What are the data that you plan to work with?
2. Where did the data come from? Are they experimental or observational?
3. Why is this data interesting to you? What questions do you hope to answer about it?
4. What are the relationships between the variables? Does theory suggest that they are related in some way?
5. What random components are there (e.g., measurement error)?
6. What prior research on your topic might be helpful to consider?
7. What methods might be useful in analyzing this data?

Please answer these questions (and perhaps others) in a project proposal for your final project. The proposal should be typed, using complete sentences and proper grammar (I expect proposals to be roughly a page in length). The proposal is due on Canvas by midnight on February 26, 2020.

Poster Tips

Here are some tips and links that might help you with creating your poster.

1. You can print your poster here.
    a. Imaging services charge $6.50 per sq foot for wide format printing and a $6.75 cutting fee. The most common poster sizes are 24x36, which costs $45.75 total, and 36x48in, which costs $84.75 total. The former is perfectly reasonable for this project.
    b. Note that it is possible to make a nice poster without spending a lot on printing (e.g., you may use poster board and neatly paste pages to it). The important thing is that your poster conveys, in a clear and succinct way, the most important findings and analyses from your project.
2. Here's a general guideline for creating an academic poster. Here's a video covering the same topic. Please let me know if you have any questions about poster design!