Research Project

Due date Monday April 28th 2021 at 11:59pm

The basic goal is to apply some of the concepts given in class to a research question.

If you are working in groups the expectation is that there should be a larger number of tests or hypothesis to follow (each member can have a hypothesis or a particular approach) as you increase the number of members in the group.

1. Look for a research topic that you are interested in and come up with an interesting hypothesis.

* You can do this step two ways:
  + A topic that you have worked before or even data that you have or are using for your own research that has a large enough sample size to be of good statistical value.
  + Think of an interesting topic or question that you would like to address.

1. Find datasets that can help you in answering the questions
2. Use multiple statistical approaches seen in class that give statistical support to your question.

* For this step you should use at least more than two statistical approaches seen in class (without counting all descriptive analysis that need to be done to make sure your data can be analyzed with the tests).
* It is ideal to test the same hypothesis using different tests as this gives support to your conclusions.
* If you don’t get a significant results, don’t get discouraged, that is what happens most of the time. You do not have to look for a new question or topic, as long as you test the hypothesis sufficiently, your conclusions should be directed toward explaining the significance of your results.
* Make sure your plots, tables or figures are correctly labeled and are clearly presented (like prepared for a manuscript), pick your top plots to include to the document (No need to include all plots -if there are not relevant).
* Use alpha at 0.05
* Do some review as how the test results are presented in the literature, for example a t-test is presented like this (one-sample t-test, t33 = 1.25, p = 0.22), there is not preferred formatting just need to be consistent.

1. Complete the template:

* The template is meant to be used as a guideline but if you want to use your own structure you are welcome to do so.
* The document should not be long (no hard limit number of pages), try to summarize the most important and relevant results that make your conclusions strong. Don’t try to include everything, there will be a negative correlation between the amount of unnecessary information in the document and grade.
* The topic you choose need to have a high degree of scholastic research. Look at the primary literature and cite your references appropriately.

Final Project Template

Title

Abstract (No more than 250 words)

Introduction:

Literature review to the problem or question

Why is this topic important or interesting

Main questions

Data Hypothesis

Methods:

Which datasets are you using (or from where are you collecting the data)

Descriptive Statistics (of the clean up data)

Tests (why did you chose those tests to answer the questions)

Results:

Data analysis: test your hypothesis

Figures (tables) that best illustrate your results (at least 2 or 3). Visualization is the window to your work, good visualization will enhance and gives the reader a good change in understanding your work. Bad visualization can kill your work (even if it is a good research)

Conclusions:

How do the results fit in the larger picture of this research domain? Tide these results to the intro.

What's next

References