**Problem Set 6**

This problem set covers material from class on October 7/8 and October 12/13 including material from OIS Sections 6.3, 7.3, and 7.4. It makes use similar data to that we discussed in class. Partial credit may be given for answers that are correct in part, but not in full. As a reminder, you are allowed to work with others, but your answer should be your own. What that means is that on problems that require you to write interpretations or responses, you should make sure that you and those you work with do not provide answers that are constructed similarly. This problem set is due at 11:59 pm on October 15, 2020. This is meant to be a shorter problem set so that you have time to prepare for the upcoming take-home exam and so that we can get you feedback more quickly.

**More Blue Dog Data**

In class this week, we are reading sections of Andrew Clarke’s honors thesis on the Blue Dog Caucus. In this section, you will be conducting several analyses that replicate tests he ran a decade ago on earlier Congresses.

1. The Blue Dog Caucus has a reputation for fiscal conservatism. The National Taxpayers Union (NTU) puts out scores each year that measure ["the way that members of Congress vote for taxpayers."](https://www.ntu.org/ratecongress) (60 pts.)
   1. In class, we looked/will look at NTU ratings for 2019 among members of the current Congress. Here we are interested in looking at NTU ratings for members who received a NTU rating in 2018 (i.e., members who are not currently in their first term.) In 2018, the mean NTU rating for the 17 Blue Dogs who are in the current Congress was 20.29 and the standard deviation was 10.79. In contrast, the mean NTU rating for the 151 non-Blue Dogs are in the current Congress was 6.32 and the standard deviation was 3.71. Please calculate and interpret the 95% confidence interval for the difference in mean NTU score for Blue Dogs and non-Blue Dogs. Please show your work. (20 pts.)
   2. Please find the t-score and p-value and discuss whether there is evidence to suggest a difference in mean NTU score for Blue Dogs and non-Blue Dogs. Please show your work, explain how you found the p-value and interpret the p-value. If you did a one-sided greater-than test, would you have enough evidence to suggest that the average score for Blue Dogs is ***higher*** than that of non-Blue Dogs? (20 pts.)
   3. Please compare your results to what Andrew Clarke found when he conducted a difference of means test for NTU scores in the 104th to 110th Congresses. What similarities and differences exist here in terms of the ***level*** of NTU scores and hypothesis test results? (10 pts.)
   4. If β were equal to 0.1, what would be the statistical power of our test? Would our power increase or decrease if we were able to increase or sample size? (10 pts.)
2. Clarke used Chi-Square Tests to look at the makeup of “prestige” committees in Congress to see whether Blue Dogs were overrepresented on these committees. (40 pts.)
   1. Below is a table of membership on the Ways and Means Committee in the current Congress. Please conduct a Chi-Square Test to determine if Blue Dogs are overrepresented. Please show your work and interpret your p-value. (30 pts.)

|  |  |  |
| --- | --- | --- |
|  | Non-Member | Member |
| Non-Blue Dog | 189 | 21 |
| Blue Dog | 23 | 3 |

* 1. Should you be cautious in interpreting your results of this test? Why? (10 pts.)