POL 212
Winter 2024
Assignment 6

1. Going back to the ANES 2022 Pilot Study data from previous assignments (Assignments 3 and 4, specifically), fit a regression model in which the difference in Trump and Biden feeling thermometers is a treated as a function of race, gender, age, income, and education.

2. Now add an interaction term between any two of the continuous predictors in the model (for instance, age and income are usually treated as continuous measures). *Note: this can be an interaction suggested by the tree results from Assignment 5.*

3. Report and interpret the results for the interaction term.

4. Run diagnostics on the interaction term. Does your interaction violate the linearity assumption? If so, how might you fix it?

CHALLENGE QUESTION: ANSWER C1 or C2

C1.) Consider the following puzzle, one of Lewis Carroll's famous "pillow problems"[1]. Use a simulation-based approach in R to approximate the answer to this puzzle:

> A bag contains a single ball that is colored either red or white with equal probability [i.e., prob(red)=0.5 and prob(white)=0.5]. A white ball is placed in the bag, the bag is shaken, and a ball is drawn randomly. This ball is white.
>
> Now, what is now the probability that the remaining ball is also white?

C2.) Use a Monte Carlo approach to simulate an additional independent variable to add to your regression model in the first part of this assignment. This variable (you can call it whatever you like) should moderate the effect of **age** in some nonlinear fashion. Attempt to diagnose the functional form of this relationship using tools in the **interflex** package.

[1] Numberphile provides a nice overview of this problem and its solution here: https://www.youtube.com/watch?v=n2Kp3toDJ9c (SPOILER ALERT!)