Week 7 Lab Exercises

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Complete the following tasks alone or in groups.

1 Re-implementing OLS

Re-implement the OLS model using `R` code.

1. Write an estimation function that accepts input data for the dependent variable and for a data frame of independent variables. The function should use OLS to generate coefficients, standard errors, p values, variance–covariance matrix, and R^2 and print these results to the console.
2. Describe and explain the different steps using equations and words.
3. Apply the function to the `Prestige` dataset in the `car` package, just like we did using the `lm` function on slides 11–16 in Week 5. I. e., regress the logarithm of the income on the percentage of women and the average years of education, and show the results to verify that your function returns the same results as the `lm` function.
4. Interpret the magnitude and significance of the coefficients substantively, using words and numbers. You do not need to predict anything for this task; you are being asked to explain the results of the model. If you failed to complete the previous tasks successfully, you can use the results from the slides.

2 Heteroskedasticity

Open the analysis you conducted on the lab session for Week 6 (the health policy debate regression model).

1. Check graphically and with a hypothesis test whether there is heteroskedasticity, and explain your answer and the result.
2. Use heteroskedasticity-consistent standard errors. Does this make a substantive difference?
3. Use WLS and FGLS.