ECON 0150 | Fall 2025 | Homework 5.1

Due: Friday, November 21 at 5PM

Homework is designed to both test your knowledge and challenge you to apply familiar concepts in new applications. Answer clearly and completely. You are welcomed and encouraged to work in groups so long as your work is your own. Use the provided datasets to answer the following questions. Then submit your figures and answers to Gradescope.

Q1. Mental Health and County Unemployment

In Homework 4.3, you estimated the relationship between county-level unemployment and self-reported mental health using 2011 BRFSS data. You now have an extended version of the dataset that includes additional individual-level control variables.

a) Estimate the following multiple regression model:

$$\texttt{menthlth}_i = \beta_0 + \beta_1 \cdot \texttt{county\_unemp}_i + \beta_2 \cdot X_{i1} + \beta_3 \cdot X_{i2} + \beta_4 \cdot X_{i3} + \varepsilon_i \tag{1}$$

where the additional variables X_{i1}, X_{i2}, X_{i3} are `College`, `Married`, and `Female` in the dataset. Report your regression output.

b) Interpret the coefficient on `county_unemp`. How does it compare to the simple regression you ran in Homework 4.3? Has the estimate changed in sign, magnitude, or significance?

Q2. Group Members

List your name with the names of your current group members. For example: "Taylor Weidman, Molly Kraybill, Maxine Kraybill".

Q3. Research Question

Describe the question you aim to test in your final project.

Q4. Data Source

Find and download a dataset relevant to your research question from a reliable source. There are many resources on the course website. The dataset should include at least 2 variables and sufficient observations (usually $n > 30$) to support analysis. Provide a link to your dataset.

Q5. Data Visualization

Create at least one visualization that illustrates the main relationship in your research question in Q3.

Q6. Interpretation

In one sentence interpret what your visualization reveals about your question.

Q7. General Linear Model

Construct and run a simple linear model related to your research question. Your coefficients do not need to be statistically significant. In 150-200 words, connect your regression results to your research question.