DXE_EMTR 2023
Third assignment (20% of total grade)

Please submit the assignment by 15 Dec in the IS MUNI system. You are allowed and <u>encouraged</u> to work in groups of maximum size 3. Please don't forget to submit your R-code too.

1 Regression Discontinuity Design (8%)

Suppose you would be interested in estimating the effect of alcohol consumption on mortality for young adults. The legal drinking age is 18 in Czechia and suppose that one can observe a discontinuous jump in mortality around the threshold 18 years. This suggests that Regression Discontinuity Design may be an appropriate approach to tackle this research question.

- Describe in detail how would an ideal dataset look like that would allow you to proceed.
- Write down the assumptions necessary for credible estimation of the desired causal effect. Be specific.
- Explain how you could detect potential violations of the identifying assumptions.

The following article is helpful for this task: Carpenter, Christopher, and Carlos Dobkin. "The effect of alcohol consumption on mortality: regression discontinuity evidence from the minimum drinking age." American Economic Journal: Applied Economics 1.1 (2009): 164-82.

- The abstract of Carpenter and Dobkin (2009) says: "We estimate a 10 percent increase in the number of drinking days for young adults results in a 4.3 percent increase in mortality." Explain in detail how was this number "4.3 percent" calculated, where is it coming from.

2 Difference-in-Differences (12%)

Is studying math worth the effort? Joshua Goodman looked into this important question in his 2019 Journal of Labor Economics article (Goodman 2019).

- Provide sufficient background information and present the research idea of this paper.
- Explain the research design and the core estimation technique in detail (you don't need to explain all the sensitivity checks).

This paper uses Two-ways fixed effects regression framework (with a staggered rollout) and we know that in case of variation in treatment timing, this may be an issue and that the regression coefficient of interest may be difficult to interpret. In order to explore this issue you are asked to conduct a Goodman-Bacon decomposition (Goodman-Bacon 2021) on a simplified aggregated version of the dataset that is in `math_reform` in `bacondecomp` library.

- Run the Goodman-Bacon decomposition in R using `bacon()` function from `bacondecomp` library.
- Plot the different 2x2 DiD comparisons.
- Interpret the results carefully. (Goodman-Bacon's presentation may be helpful for this part: https://taylorjwright.github.io/did-reading-group/.)

Goodman, J. (2019). The labor of division: Returns to compulsory high school math coursework. Journal of Labor Economics, 37(4), 1141-1182.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. Journal of Econometrics, 225(2), 254-277.