Homework for Chapter 11: Causality with Less Modeling

1. Suppose that you are analyzing the effect of universities and colleges opening during a pandemic on increase in the number of positive cases. Name one strategy that you can use to avoid having to collect data on all types of campus characteristic variables that are constant over time that you may have to control for in your analysis.
2. Intuitively, why would a method that isolates front doors allow you to ignore back doors related to unmeasured variables?
3. On robustness tests:
   1. What are robustness tests?
   2. What is the purpose of conducting a robustness test?
   3. What are placebo tests?
4. Suppose you want to study the effect of attending tutoring sessions on grade point averages (GPA). List at least five variables that impact both attendance of tutoring sessions and students’ GPA. Is it feasible to measure and control for all of the variables?
5. Describe partial identification in your own words.
6. Pick any causal diagram from the book other than Figure 11.2.
   1. Reproduce that diagram here.
   2. Select two variables on the diagram without a direct link between them (i.e. no single arrow straight from one of them to the other).
   3. What variables would you need to control for that will eliminate any relationship between the two variables (you might not need any).
   4. If you looked at the relationship between your two variables from part b, while controlling for the variables from part c, and you got a nonzero result, what would you conclude?
7. What does it mean to say that the effect of financial deregulation on the rate at which firms go bankrupt is “bounded from above” at 2 percentage points?
   1. The effect is 2 percentage points, and it’s a positive effect
   2. The effect is 2 percentage points, and it’s a negative effect
   3. The effect is at least as large as 2 percentage points
   4. The effect is no larger than 2 percentage points
   5. If we’re willing to make an additional, stronger set of assumptions, the effect would be larger than 2 percentage points, but without those assumptions it’s bounded to be lower.