Tennessee's Student Teacher Achievement Ratio (STAR) project

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Research Question and Hypothesis

- Research Question: Identify the effect of class-size in the earlier grades on short and long-term student performance.
- Main Hypothesis: Students in smaller classes (13-17 students) will perform better academically than students in regular-sized classes (22-25 students) or regular-sized classes with a teacher aide, as measured by standardized test scores in reading and math.

Data Description

- Description of Data: The experiment has a single cohort that was studied for four years. This included the students entering kindergarten in 1985 and students that initiated their public schooling in first grade in 1986.
- Unit of Observation: Student
- Experiment or Quasi-experiment: For each school of the 79 STAR schools, the students and teachers were randomly assigned to one of three treatment arms: a small class (13 to 17 students), a regular-sized class (22 to 25 students) and a regular-sized class with a full-time teacher aide.

Main Results

- Result 1: Students in smaller classes performed significantly better in reading and math compared to those in regular-sized classes
- Result 2: The positive effects of small class sizes were observed as early as kindergarten and persisted through the third grade
- Result 3: The benefits of smaller class sizes were particularly pronounced for minority students and those eligible for free lunch, suggesting that small class sizes can help reduce educational disparities
- Result 4: The presence of a teacher aide in regular-sized classes did not produce the same positive effects as reducing class size. Students in regular-sized classes with aides did not perform significantly better than those in regular-sized classes without aides

Proposed Improvements/extension

- Proposed Method 1: Causal Tree
- Proposed Method 3: Double Machine Learning (DML)

Justification for Chosen Method

- Why this method fits: Causal Forests can help us leverage the entirety of the control variables set to gain a deeper insight on possible heterogeneous treatment effects.