Asuncion Los Banos
DS-670 Capstone: Big Data & Business Analytics
Lab 10

Reference:
Dahl, G. B., & Lochner, L. (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. *The American Economic Review*, *102*(5), 1927-1956.

Competitor	My Algorithm
Using data from the US government's Earned Income Tax Credit records, they applied an "instrumental variable strategy" that established an underlying relationship between measurable expansions in family income and corresponding increases in children's math and reading scores. They found short term score improvements of six percent, with one standard deviation for every $1,000 increase in income, for low income families.	Comparing the regressions of high school standardized test scores in New Jersey on community factors from Spring 2014 and Spring 2007 data to determine if there are any significant relationships that have remained constant or changed over the seven-year period. One single variable regression and three multiple regressions were completed using average test scores as my dependent variable and community factors of average income, race (white), married household, and education of bachelor or higher as my independent variables.
Comparing the article's results and my results quantitatively.	
Utilizing an instrumental variable strategy to estimate causal effect of income on children's math & reading achievements.	Utilized a regression strategy to estimate effect of income on high school student's standardized test scores.
Identification was from nonlinear changes in the Earned Income Tax Credit.	Independent variables were derived from U.S. Census Bureau in 2007 and 2014.
Baseline estimates imply that a $1,000 increase in income raises combined math and reading test scores by 6% in the short run.	Based on the result from the single regression in 2014 a $10,000 increase in the average household income leads to a 3.2-point increase in the average score for reading and math.
Test gains are larger for children from disadvantaged families.	Average income can have some impact on standardized test scored, but it may not be the main influencing factor.
Metric: Income abstracts from the effects of past time-varying characteristics and that income has different effects at different ages. Allows for different effects of permanent characteristics at all ages.	**Metric**: Simple linear regression model of average test scores and average household income to first establish a positively correlated relationship.
Metric: Instrumental variable strategy assumes that changes in the EITC structure are independent of individual family circumstances.	**Metric**: The relationship is further analyzed by differentiating for other community factors such as race, married households, and education.

Metric: Requires at least three periods of data, to see at least two different changes in the EITC schedule over time. Instrumental variable strategy would break down if the EITC schedule did not change during their sample period.	**Metric**: For comparison and to evaluate consistencies the variables have the regressions were run on data from both 2007 and 2014.
Metric: Focus on measure of scholastic achievement in math and reading based on standardized scores on Peabody individual Achievement Test (PIAT)	**Metric**: In the final multiple regression for 2007 it found that average household income and married households were statistically significant in impacting the average test scores. Whereas in 2014 the average household was not statistically significant, while educational attainment was statistically significant.
The instrumental variable strategy found that there was a modest causal effect for children growing up in poor families. The results indicate that current income has significant effects on a child's math and reading test scores.	The coefficient for race was higher in 2014 than in 2007 for MVR I and MVR III, an indication that race as a variable may have a greater impact on test scores in 2014.
Effects are larger for children growing up in more disadvantageous families. Concurrent income has the largest effect on achievement, with smaller effects from past income.	The results showed positive relationships between all variables and the average test scores.