MBA 753: Causal Inference Methods in Business Analytics

Assignment 1

Note: Please name the file as follows: "your roll number - your first name", for example: "123456789 - Nivedita". Save it as a pdf and submit.

Q1. Using UNHDD data, fit a regression model for GNI (Gross National Income) with the partial effects of HDI (Human Development Index), GII (Gender Inequality Index), life expectancy at birth, and population age 15-64 years (in millions).

   a) Which effects are significant?
   b) Perform model diagnostics. Mention the assumptions tested, methods used and their corresponding results.
   c) Interpret the regression coefficients.

Q2. In the above regression model, replace HDI with HDI groups (all other predictors have to be retained in the model). Use "low" as the reference category for HDI groups.

   a) How many categories of HDI group are present in the dataset?
   b) Interpret the regression coefficients of HDI groups? Are they in tune with the results from question 1?
   c) Change the reference group to "Very High" and fit the model. Interpret the regression coefficients of the categorical predictor. What are your conclusions about the model?

Q3. In the regression model from question 2, include an interaction term between HDI groups and GII.

   a) Is the interaction significant?
   b) Interpret the interaction effects.
   c) Perform model diagnostics and report their results.
   d) What are your conclusions about the regression model?