**Week 8 Milestone Assignment**

In this assignment, we will return to examining the General Social Survey (GSS) data and the Publishing Paid Me Data. This assignment will represent a bit of a culmination of the course’s content, and you will be asked to deploy a variety of skills to answer specific questions using the data available. You will need to closely read each assignment item in order to determine which data to extract and analyze.

1. Create a time series plot for the variable Respondent’s Income (rincome), for every year that data is available (1974 – 2016). Make sure your submission includes all code used, as well as the graph.
2. Is Respondent’s Income (rincome) a stationary variable? To answer this question, do the following:
   1. Conduct a Dickey-Fuller test of stationarity.
   2. State your null and alternate hypotheses for the Dickey-Fuller test.
   3. What is the computed p-value for this test?
   4. Does sufficient evidence exist to reject the null hypothesis at the p < .05 level?
   5. Explain, in non-statistical language, what the results of this test mean.
   6. Provide all code and output.
3. Using simple linear regression, build a simple linear model forecasting respondent’s income.
   1. Report the resulting linear function in Y = Constant + Slope(T) format.
   2. Provide the graph of the linear function.
   3. What is the forecast for Respondent’s income for time period 5? Is it an accurate prediction for what time period 5’s value actually is in the data?
   4. What would the equation predict income to be for 2018?
   5. Provide all code and output.
4. In the Publishing Paid Me data, is there a relationship between the year a book was sold, and how large the advance was? Put another way, have book advance payments gone up over time?
   1. Explain which type of statistical test you will use to conduct this analysis, and which variables in the spreadsheet you will use to answer this question.
   2. Provide all code and output, and interpret the results of your statistical test. Assume a p<.05 significance level.
5. Do white and Black authors differ from one another, on average, in how much they get paid as a book advance, across all genres?
   1. Explain which statistical test you will use to answer this question.
   2. Provide all code and output, and interpret the results of your statistical test. Assume a p<.05 significance level.
   3. Do Black authors who have agents earn more money than Black authors who do not have agents (see “was this sale agented” variable)? Please show all code and work.