**Applied Time Series Project: Due Date: 11:59 pm on Friday December 18 2020**

**UG students must submit a detailed data analysis on a comprehensive data set you must select from some suitable website. Please feel free to discuss your proposal with me.**

**Grad students must submit**

**a) a comprehensive review of a paper that I will assign to you, and**

**b) search/find a comprehensive data set that relates to the discussion in the paper and show how data analysis proceeds.**

1. For your final project, you must provide 3 files as described below:
2. A word or pdf document with the project details:

*Undergrad\_firstname-lastname-Project* if you are registered for STAT4825

*or as Grad\_firstname-lastname-Project* if you are registered for STAT/BIST5825

1. A csv file containing the data you are using for your project:

*Undergrad\_firstname-lastname-Data* if you are registered for STAT4825

*or as Grad\_firstname-lastname-Data* if you are registered for STAT/BIST 5825

1. An Appendix file containing the code you used for your analysis, nicely commented. When I run this code using the data you give, I must be able to reproduce your results – this is something I will check during grading:

*Undergrad\_firstname-lastname-Code* if you are registered for STAT4825

*or as Grad\_firstname-lastname-Code* if you are registered for STAT/BIST 5825

If you wish, you may also upload a Misc. file.

1. For the data analysis part, UGs and Grads must clearly discuss:
2. **Introduction**:

* Describe the problem area, i.e., what application area does your project/data come from.
* Try not to use a single, rather short time series, this may not lead to interesting questions and analysis. If you select a richer set of data, the scope of your analysis will be better.
* Give a detailed data description, including data plots, summaries etc. that will also motivate the goal of your analysis.
* Give the source for the data (URL).
* Attach a csv file with the data

1. **Goal of the Analysis**:

* Clearly write a para or two on what the goal of your project is.
* You may cite relevant references from the literature.

(c ) **Comprehensive** **Data Analysis**:

* Clearly motivate and describe your choice of the class of models (ARMA, Regression ARMA, VAR, ARCH/GARCH, State Space Models,).
* If relevant, make sure you use calibration and test portions, fit the models to data - parameter estimation, model diagnostics, model selection.
* If relevant, show how you will use the best model(s) for future prediction.
* If relevant, discuss both point and interval estimation and prediction.

1. **Discussion of Results and Summary**:

* Discusswhether andhow your goals were addressed by your data analysis.
* What did you learn about this data? What else would you have liked to do with this data/problem, if you learned more time series details?
* Provide an overall summary of the analysis.

1. **References**:

* If you referred to journal articles, or books, or websites, provide a list of these under References.

**UG students**: The Project should be about 10 pages and should not exceed 15 pages max. Show only the most relevant tables and figures. Every other table/figure can go into the Appendix, which should be a separate file.

**Grad students**:

1. The comprehensive description and analysis of the paper you read should be at least 5 pages long.
2. The accompanying data analysis should be about 10 pages and should not exceed 15 pages max. Show only the most relevant tables and figures. Every other table/figure can go into the Appendix, which should be a separate file.

**Appendix File:**

* This file should contain the code you are using. If I run your code along with your data set, I should be able to produce your results. This is crucial.
* This file can also contain tables and figures that you do not have space to include in the main project file.

**Data File:**

As I mentioned earlier, you must provide the data as a csv file. Just giving a link to the data is NOT ok.