Final Team Exam

The Goal

This final exam is designed to give you and your teammates another chance to create a solution to a real-world problem using the tools from this class, and is inteded to allow you to make use of any or all of the tools taught throughout the semester. The intent of the examination is to allow you to demonstrate your ability to choose an appropriate solution from your forecasting toolkit, and present your solution to the rest of the class.

What to Prepare

Your team is expected to prepare the following items:

1. An executive summary of the problem and your *prototyped* solution
   (a) Should be clear and concise
   (b) Needs to be readable by non-specialists
2. A 10-15 minute presentation of your solution (each team will present to the class!)
   (a) ALL team members should be part of the presentation
   (b) State findings first, then detail the why and the how
   (c) May use whatever presentation technology you want
3. Your code, as well as the data file that you used (we share both in order to enable replication, since this is a critical component of analysis)
   (a) Please comment all code, to make it clear to new readers
   (b) I should be able to run the code without errors on my computer
   (c) Provide the data **as you formatted it to work with your code**

Tools

A list of tools and useful documentation.

- Least Squares Regressions - `http://www.statsmodels.org/stable/regression.html`
- ARIMA Models - `http://www.statsmodels.org/stable/generated/statsmodels.tsa.arima_model.ARIMA.html?highlight=arima`
- VAR Models - `http://www.statsmodels.org/0.6.1/generated/statsmodels.tsa.vector_ar.var_model.VAR.html`
- Generalized Additive Models - `https://github.com/dswah/pyGAM`
- Fixed-Effect Panel Models - See Least Squares Regressions with cluster-robust standard errors

- Logistic Regression - `http://www.statsmodels.org/stable/generated/statsmodels.discrete.discrete_model.Logit.html` OR `http://scikit-learn.org/stable/modules/generated/sklearn.linear_model.LogisticRegression.html`
- Decision Trees - `http://scikit-learn.org/stable/modules/generated/sklearn.tree.DecisionTreeClassifier.html`
  - For visualizing a decision tree, see also `http://scikit-learn.org/stable/modules/generated/sklearn.tree.export_graphviz.html`
- Random Forests - `http://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestClassifier.html`
- Support Vector Machines - `http://scikit-learn.org/stable/modules/generated/sklearn.svm.SVC.html`
- k-Nearest Neighbors - `http://scikit-learn.org/stable/modules/generated/sklearn.neighbors.KNeighborsClassifier.html`

Note on Grading

Even though this is a group project, I reserve the right to grade each individual, and will not hesitate to award a higher grade to team members who contribute more to the project than to those team members who choose not to contribute to the progress of their team.