BIA6315

Project Options

Work related;

Contact me with any ideas on have on using work related data as a project.

Reinforcement of Material:

This will reinforce all the models done in the homeworks. Make sure you use all the “rules” of the homework including the use of ggplots, robust discussion, professional look.

The attached dataset (day) is a bike sharing program. You have a number of attributes, but you are trying to forecast the number of bikes shared per day (cnt). This is “real” data from a bike sharing program in Washington, DC. The project is the DC program wants you to build a forecast program for them, and potentially share it with the other bike sharing programs that are across the country.

Read in the data as a zoo object.

Your **cnt** H is 10 periods for each of the below (like a 10 day weather forecast you see everyday). Report both AIC and RSME or MAPE in your discussion.

1. Perform a full time series EDA on cnt. Verify the statistical properties of the time series (cnt) and make any transformations as necessary. Run both visual and hypothesis driven tests. Discuss your conclusions.
2. Decompose and forecast your time series using X11, SEATS and STL. Discuss your conclusions. (feel free to throw in X-12 or X-13 instead of X11)
3. Fit and forecast at least 3\* different smoothing models (which may include drift, additive or multiplicative and damp). Discuss your conclusions.
4. Fit and forecast at least 3\* different ARIMA models (which may include seasonal and non-seasonal). Discuss your conclusions.
5. Fit and forecast at least 3\* different dynamic regression models using a set or subset of other covariates which are in the dataset (cnt is still your DV). The covariates may need lagged too. Then discuss your conclusions.
6. Compare the above models and determine a best one for production and distribution. Discuss why you think it performs the best. Why you think your model captures the fit and forecast the best. Any downsides to your forecast model?

\*3 denotes the minimum. You may choose or need to do more.

Getting into the Advanced:

This is if you want to get your hands on some advanced tools that were not done in the homeworks.

Hyndman:

Ch 10: 2-5

Ch 11: 1-3 (+ perform a bagging and bootstrapping on the gasoline dataset).