

STAT 520, Fall 2015: Final Project

The final project gives you an opportunity to apply the techniques developed in STAT 520 to a dataset of your choosing. It is worth 10% of your final grade, so be complete and thorough. Here are some general guidelines; read carefully.

1. The Final Project is “officially” due Wednesday, Nov. 25, but you can turn it in anytime before Friday, Dec. 4 for full credit. Do not turn the Final Project in after Dec. 4. Please email it, as usual, to Yawei Liang at yliang@email.sc.edu.
2. Your project should start with a description of the time series $\{Y_t\}_{t=1}^n$ including why the series was collected, the time periods (days, weeks, months, etc.) used, the window of time observed (e.g. January 2004 through December 2007), and any other pertinent information. Include a high-quality time series plot of your (original, untransformed) data as you did in Homework 4.
3. Use the general approach outlined in pp. 173–174 in the notes to find a small subset of plausible candidate models for further consideration. Be sure to consider a (Box-Cox) transformation *first*, before differencing or modeling trends. Use all the tools at your disposal: ACF, PACF, EACF, BIC, and AIC to help you choose models. Fit the candidate models and then favor a final model where the diagnostics of Chapter 8 show that assumptions are adequately satisfied. If there are more than one potential models that fit okay, choose the model with the smallest AIC for final consideration. Only use maximum likelihood for fitting.
4. Once you have a final model hold out the last, say, 5% of the observations, fit the model, and superimpose the actual final 5% of the series along with the forecasts and intervals to see how well your model does.
5. Since seasonality will be considered in detail in Chapter 10, try to avoid strongly seasonal data. If your data does show strong seasonality, we can use the methods of Chapter 3 to detrend, coupled with ideas in Chapter 10. You will have to read ahead to complete your project in this case.
6. I would like your final project to be typed, two to three pages in length, single-spaced, with only a handful of pertinent plots in the body of the paper. Place additional plots, R code, additional details, etc. in appendices following the actual paper. Try to have fun and keep your writing lively! Don’t be afraid to be creative, but also make sure what you are doing is correct and does not fall too far outside of the structure provided by STAT 520. Proofread your final draft before handing it in to eliminate awkward grammar and spelling errors.