STAT 485/685 Lecture 14
Fall 2017
30 October 2017

- I discussed added constants in ARIMA(p, d, q) processes.
- If X_t is a mean 0 $MA(q)$ process then we get an ARMA(p, q) either by

$$Y_t = \alpha = \sum_1^p \phi_j Y_{t-j} + X_t$$

  or by

$$Y_t - \mu = \sum_1^p \phi_j (Y_{t-j} - \mu) + X_t.$$

  These are the same models; the correspondence is

$$\alpha = \mu(1 - \sum_1^p \phi_j).$$

- I pointed out that if

$$Y_t - Y_{t-1} = X_t$$

  then

$$(Y_t - \mu) - (Y_{t-1} - \mu) = X_t$$

  so you *cannot* solve for μ!
- In forecasting for an ARIMA series we undo the differencing and add that to forecasts of $W_t = \nabla^d Y_t$.
- Then I very briefly discussed other transformations: log, square root, Box Cox.
- Then I started a computing demonstration. I used the electricity data from `TSA`. I tried to show how taking logs straightened the series and stabilized the variability. Code is at `R` code.
- Handwritten slides.