STAT 485/685 Lecture 9
Fall 2017
5 October 2017

- I introduced the MA(q), AR(p) and ARMA(p, q) processes.
- I discussed the autocovariance and autocorrelation of simple examples of these.
- I wrote the AR(1) process in two ways: as a General Linear Process and as an autoregression:

$$Y_t - \mu = \theta(Y_t - \mu) + \epsilon_t.$$

- I noted that $|\theta| < 1$ was needed to make this work.
- I drew the correspondence between things like

$$Y_t - \phi_1 Y_{t-1} - \phi_2 Y_{t-2}$$

and the polynomial

$$1 - \phi_1 x - \phi_2 x^2$$

- Analogous polynomials apply for $p \neq 2$ as well.
- And Y could be stationary if all the roots of these polynomials have absolute value larger than 1.
- I tried to explain the mismatch between the books sign choice and the `R` sign choice for the MA coefficients in an ARMA(p, q) model.
- I ran a variety of `R` code simulation various AR, MA, and ARMA processes and plotting their sample autocorrelation functions.
- The code is here.
- In the text I am finishing Chapter 4. We will be done that next week.
- You should be Reading all of Chapters 1, through 5.
- Handwritten slides.