STAT 485/685: Fall 2017

Assignment 1

1. From text Chapter 2 number 1.
2. From text Chapter 2 number 2.
3. From text Chapter 2 number 3.
4. From text Chapter 2 number 4(i).
5. From text Chapter 2 number 5.
6. From text Chapter 2 number 7.
7. The semivariogram of a stationary process X is

$$\gamma_X(m) = \frac{1}{2}E[(X_{t+m} - X_t)^2]\,.$$

   (Without the 1/2 it's called the variogram.) Evaluate γ in terms of the autocovariance of X.

8. I am emailing the class a .csv file which contains monthly rainfall in Vancouver beginning in February 1896 and ending at the end of December 2012. I want you to use `R` to read it in (try `read.table` and `scan` or `read.csv` or `read`). You will have to convert the result to a time series (look at `ts`). Then plot the monthly series and the annual series (the latter is one column in the file). Are they stationary? How do the plots compare with the LA rainfall data? Make sure you label the axes appropriately.
9. Use `monthplot` to examine this series. Write a couple of sentences summarizing what you find.
10. Generate 100 independent exponential random variables (`rexp`) and make them into a time series of length 100. Plot y_t against y_{t+1}. Do you see any relationship in this plot?

DUE: Wednesday 20 September by noon at the latest.