Trend Detection, Dealing with Data & Bootstrapping
Scientific Computing
Target Due Date: Friday, February 16, 2018

College of the Atlantic

Figure 1: Explanation of terms in datafile. For documentation, see https://www.ncdc.noaa.gov/cdo-web/datasets#GSOM.

Various weather data for Farmington, Maine can be found at: http://hornacek.coa.edu/dave/Teaching/Computing.W18/assets/1213653.csv. Note that this file is a bit different than the one we used in class. You'll want to open it in both notepad and a spreadsheet to take a look. This file contains precipitation and various indirect measures of precipitation and temperature. See Fig. 1.

Choose one (or more) of the meteorological quantities in the data file to analyze. Your task is to write a program that tests for monthly trends in the variable you chose. Specifically:

1. Your code should omit missing data.

2. Make a plot the time series for the variable and month you chose.

3. Calculate the Mann-Kendall Tau.

4. Perform block bootstrapping with a few different block sizes L to test for significance. Show both a histogram and give a two-sided p value.

5. Plots should have labels and titles that make them understandable and self-contained. They shouldn't need a caption. Include in your histogram plot the number of bootstrap samples you used and your estimated p-value. There is no need to write anything to accompany your plots.

6. Your code should be nicely commented and reasonably easy to read.

Please upload your code and plots to your google drive.