CE640 / OC599 Matlab
Homework 5 – reading files…
10/29/10, due 11/05/10.

1. Look at the file sep_2013_buoy_data.txt. This comes from the Stonewall Bank buoy. See http://www.ndbc.noaa.gov/station_history.php?station=46050. This is the 'standard met' file from September 2013. The data format is at http://www.ndbc.noaa.gov/measdes.shtml. Write a m-file that will read this complete file, including variable names and units. Make a plot of air temperature as a function of time (use datenum / datetick to make the x axis make sense; base this off of read-in variables…don't fake things by creating vectors of hours / days, etc.). Make a second plot that plots (scatter) waveheight against wind speed to see if there is any correlation there.
2. In the same mfile, have it write a file (called sep_2013_daily.txt) that has a single row for each day. The format of this file should be largely the same as the input file (same headers, for example). However, the hh and mm columns will no longer be there. Each row should now be an average of the data values for that day. Write the file out as simple ascii text.
3. A trickier task. Look at the file air_temp_distributions.txt. This also comes from Stonewall. It is the air temperature climatology for each month. It has complex file formatting, but you can find some details at http://www.ndbc.noaa.gov/climatedesc.shtml. In the first column you find degrees C. In following 'column pairs' (one for each month), you find the PDF and the CDF of temperatures. The CDF values are in tenths of percent. While not explicitly stated, it looks to me like the PDF values are in hundreths of percent. The CDF should be the integral of the PDF. Note that there are a lot of 'non-numeric' characters in this file which will greatly complicate the data input. I would like you to write an mfile that will read in this data. I would then like you to make a plot that displays the CDF for Jan, July, and annual (can use 3 x 1 subplot if you like). Further down in the file, you will see that the 75^{th}, 50^{th}, and 25^{th} percentile values are given. Please superimpose these on your curves (use a symbol only (circle, etc.) for these data points). Label everything, make it look nice, and good luck!