

Soft Computing

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Homework 1: warming up with matlab®

Due: Tuesday September 4<sup>th</sup> at the beginning of class (no later than 6:10pm)

Write a matlab program that

- reads in data from a flat file (measurements.dat). The data are arranged in matrix form where each column contains data for a day. Data were measured each hour starting at midnight. The file can be downloaded from the syllabus page off the class web site  
<http://www.cs.rpi.edu/courses/fall01/soft-computing/syllabus.html>
- weeds out (i.e., disregard) outliers that are characterized by readings diverging more than 8 standard deviations from the mean of the previous day. Initialize first day parameters assuming data for the first day is OK.
- plots the correct temperature data versus the hours (label them 1-24), but not the outliers. On the plot, create a separate line for each day. Put all lines on one graph. Provide a means to distinguish the different lines and the points on the lines (e.g., use a different shape or color for the points on each line).
- converts the data in measurement.dat from Fahrenheit into Celsius  
$$\text{Celsius} = 5/9 * (\text{Fahrenheit} - 32)$$
- displays the max, min, and mean for each day on one different graph using red for max, blue for min, and black for mean
- assigns labels to the axes and add a legend

What to hand in:

matlab program using several functions to detect and remove outliers, convert data, display data. Use several .m files (4 points).

List of outliers (1 point)

(example: day 2 reading 3 and day 3 reading 4 where the first column of data is day 1)

The 2 graphs described above (4 points)

Hint:

Potentially useful built-in matlab functions are:

max, min, mean, std, load, size, plot, xlabel, ylabel, legend, abs, [ ], disp, int2str, ...

You do not need to use any of the above functions. If you find it useful, feel free to use other functions besides those listed.

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To run matlab from the RCS account:

1: log into an RCS account

or 2: "attach" to the RCS AFS directory structure

/usr/afsws/bin/klog <user-id-on-RCS>

provide the appropriate RCS password.

From that point, all software available on the RCS system should be available on the local machine.

Note: this attachment needs only be performed once per login session (not for every command shell opened)

3. Type “matlab” at the prompt