Homework 1: Standardizing Data

Due August 30, 2018 at 2:10 PM

This homework is meant to familiarize you with writing functions and scripts in MATLAB, as well as generating random data and printing results. No formal report is required for this assignment. Please submit your zscore1 function and a diary of the code's usage (see the diary command).

Write a "function" m-file called zscore1 that scales a data matrix so that each column has a unit variance and zero mean and returns the scaling parameters (mean and standard deviation). The function call should be:

```
[xs, x_mean, x_std] = zscore1(x)
```

where x is the original data set, xs is the scaled data, x_mean is a vector containing the mean of each column of x, and x_std is a vector containing the standard deviation of each column of x. *Do not use the zscore function inside your zscore1 function – program in the calculation.*

To test your program, generate a matrix of random test data with 4 variables (columns) and 20 observations (rows). **Each column should have a different mean and standard deviation.** Note that, after running zscore1, your scaled data matrix (xs) should have mean of zero and standard deviation of 1 in every column.

Use the diary command to save the relevant command-line commands and results to demonstrate that your zscore1 function works correctly. This should include:

1. Create a matrix of random test data that meets the criteria above.
2. Call the zscore1 function to give the calculated standardized data matrix, mean vector, and standard deviation vector.
3. Visually compare the calculated mean and standard deviation vectors to those you expect (based on how you generated your random test data).
4. Check the mean and standard deviation of the columns in xs.