**CS 6635 Spring Semester 2018**

**Date: Thursday, January 18, 2018**

**Due Date: Tuesday, January 30, 2018**

**Assignment 1**

**Plotting and Graphing using Python and/or Matlab**

Use either Matplotlib in Python or Matlab to perform the following plotting:

**Part 1: Generate your own data**

1. Create an array with 100 elements from 1 to 100 in order: Create a **box plot** to visualization your data.
2. Create an array with 10,000 random numbers. Create a **histogram** of the data using 20 bins.
3. Write a program to generate 100 random number uniformly distributed between 1 and 100. Write the numbers out to a binary file and use a **line graph** to draw the 100 numbers.
4. Write a program to read the binary file back, divide the range between 1 and 100 into 7 intervals, and calculate the frequency for each interval: display **a histogram** of your result.

**Part 2: Interesting data sets**

1. Download the NOAA Land Ocean Temperature Anomalies Data Set: https://www.ncdc.noaa.gov/cag/time-series/global/globe/land_ocean/1/6/1880-2017.csv. Create a histogram of the data. Include a label called "Year" along the x-axis and a label called Degrees F +/- From Average along the y-axis. Describe trends in the data.
2. Download the member of Congress by Age data set: https://raw.githubusercontent.com/fivethirtyeight/data/master/congress-age/congress-terms.csv. Create a **Star Plot** of the data and create a **Parallel Coordinates** Plot of the data. Describe the trends in the data.
3. Download the U.S. Birth data set: https://raw.githubusercontent.com/fivethirtyeight/data/master/births/US_births_2000-2014_SSA.csv. What day of the month had the highest number of births? What day of the month had the lowest number of births? Are there any interesting trends in the data, i.e. more births in Summer or Winter? What about births on Friday the 13$^{th}$?
4. The U.S. Government maintains a sever with many interesting datasets called Data.Gov: https://www.data.gov/. Choose 3 different data sets to visualize. Visualize the data sets in at least 3 different ways. Describe the trends in the data.

**Extra Credit: Do the assignment in BOTH Python and Matlab.**