CMPSC 580
Junior Seminar
Spring 2019

Lab 4 Assignment
Creating Graphics from Data Using Python

Objectives

To enhance your understanding of using programming languages to prepare plots from sets of data. In this assignment, you will be modifying Python code to create plots to add to a Latex document and a Beamer presentation.

GitHub Starter Link

<div align="center">

https://classroom.github.com/a/mla_81fs

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To use this link, please follow the steps below.

- Click on the link and accept the assignment

- Once the importing task has completed, click on the created assignment link which will take you to your newly created github repository for this lab,

- Clone this repository (bearing your name) and work locally

- As you are working on your lab, you are to commit and push regularly. The commands are the following.

  - `git add -A`
  - `git commit -m "Your notes about commit here"`
  - `git push`

Introduction

When you read an article containing data to make an argument or describe a pattern, you will often notice that the trend is shown in a visual way using plots. When displaying data in histograms, plots and other types of graphical displays, a reader may much more easily (and conveniently) digest the message that the data is trying to present and, hence, to follow your point. Although many common spreadsheet softwares such as Libre-Office and others are able to create plots from data, the data must first be entered into a formatted spreadsheet and then the options to perform the plotting in the menu must be used. Selecting items from a menu, and dealing with options, may take much time when creating many different plots from different datasets.

A better idea is to have a simple program create (and automate) the plot for you. A program command may even be placed into a batch script and so all your plots can be quickly created with minimal user-work and few commands when the data is updated. Beside the fact that it is much

easier to issue bash-commands to automatically plot data, you will notice that your graphics from this type of system will look differently from those created by standardized software. This might raise eye-brows and add excitement for your work.

Graphing Assignment: prepare five unique plots from code

In this lab, you are to visit the MatplotLib website (`https://matplotlib.org/gallery.html`) where you will find the source code for countless types of plots – each one has some special angle to display some part off the data in a novel way. The source code is given for each type of plot and you are to modify this code to produce five (5) unique plots. Note: your plots will be different in some way from the plots offered by the web site. It is up to you to decide how to change the code but think creatively and enjoy working with the code to produce your amazing results.

Latex and Beamer Graphics

Once you have prepared your plots, you are to make files that you will incorporate into a latex document and a Beamer presentation. The same files may be placed into each of your documents (i.e., the article and the presentation). When adding the plot, be sure to add a caption in the `beginfigure` environment to what kind of graphic it is and also to declare the source code file that you used to create the plot. Please be sure to include your source code with your submission.

Summary of Deliverables

- Edit the generic Latex files: `writing/article/article.tex` and `writing/beamer/presentation.tex` to include your five plots which have been added as `figures` and given captions to state what type of data they are showing and to state which off your included source code files made the graphic. The files already have some code in them to help guild your work.

- Add the Python source code for your plots to the `src/` directory. Be sure to indicate in your documents which source code you used to create each of your graphics.