Project 4 - Interactive Visualization using D3

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Due November 3, 2020

NOTE: This is a robust assignment. I strongly encourage you to begin work early. I will extend my office hours during this assignment and am also happy to take meetings by request. I highly encourage you to reach out to me for help with data set identification and dashboard concept as your submissions will be assessed against examples provided by each platform as well as public github repositories.

1 Purpose

During the last 5 years, a number of software tools have been designed to help users explore complex data by creating visualizations and dashboards. Popular off-the-shelf tools include Tableau, Qlikview, Spotfire, Microsoft Power BI, MicroStrategy, Birst, and Logi among many others. Unfortunately, those tools only provide a small set of built-in visualizations that the user must use to visualize the data. Often users are interested in using advanced visualization techniques that are not available within those off-the-shelf applications.

Recently, a number of libraries have been released to help organizations develop new visualizations and illustration tools. Some of the popular libraries include D3, Processing, R, and ProtoVIS. As data scientists, it is important for us to have a basic understanding of those libraries and their capabilities. The purpose of this assignment is to get familiar with open source libraries by developing three sample visualizations using D3.js, NVD3.js, Plot,ly, or R Shiny.

2 Task

1. Find 3 datasets that you would like to analyze. The data should have over 100 rows and one of them should have more than 5 variables. *Datasets in D3, NVD3, Plot.ly or R Shiny, or any other visualization platforms cannot be used in the project.*

2. Develop three different visualizations in D3, NVD3, Plot.ly, or R Shiny to illustrate the datasets that you selected.

   - Students should develop their own visualizations or select samples from the corresponding libraries
     - D3 Gallery (https://github.com/d3/d3/wiki/Gallery)
     - NVD3 Gallery (http://nvd3.org/examples/)
     - R Shiny Gallery (https://shiny.rstudio.com/gallery/)
     - Plot.ly Gallery (https://plot.ly/python/)
   - Students must change the data source to use the dataset they selected as part of step 1.
   - Students should make at least one significant change to each visualization / source code they selected. Changes can be (but not limited to) changing colors, adding tooltips, adding interaction, incorporating D3 within a Bootstrap framework, adding a markdown with analysis, etc... If students are modifying existing D3, NVD3, Plot.ly, or R Shiny examples, students must describe in the document the changes that they did to each of the original programs.

- Each of the visualizations must have some sort of user interaction to enable data exploration (e.g. filters, sorting, selection, tooltip, etc...).

3. File structure: students should structure their code the following way.

- your_lastname_project04/
  - your_lastname_project04.docx or your_lastname_project04.pdf
  - JS/
  - Sample01/
    - Index1.html
    - Data1.csv
    - Screenshot_sample01.jpg
  - Sample02/
    - Index2.html
    - Data2.csv
    - Screenshot_sample02.jpg
  - Sample03/
    - Index3.html
    - Data3.csv
    - Screenshot_sample02.jpg

or something like

- your_lastname_project04/
  - your_lastname_project04.docx or your_lastname_project04.pdf
  - R/
  - Sample01/
    - Index1.html
    - Sample01.R
    - Data1.csv
    - Screenshot_sample01.jpg
  - Sample02/
    - Index2.html
    - Sample02.R
    - Data2.csv
    - Screenshot_sample02.jpg
  - Sample03/
    - Index3.html
    - Sample03.R
    - Data3.csv
    - Screenshot_sample02.jpg

If using JavaScript, students must include a directory with the JavaScript files.

3 Useful Links

- https://d3js.org/
- https://github.com/d3/d3/wiki/Tutorials

- http://alignedleft.com/tutorials/d3/
- https://shiny.rstudio.com
- http://nvd3.org
- https://plot.ly/python/
- https://jupyter-dashboards-layout.readthedocs.io/en/latest/using.html

4 What to submit

- A .zip file with the file structure shown above
- Paper describing your project, the datasets that were chosen, the thee visualizations that were developed (including screenshot), and explanation about what was updated from any sample code that was used.
- Submit document through Blackboard. Please use the following file format: your_lastname_project04.zip