Homework-5

MATPLOTLIB:

- What is the license for the software?

  Matplotlib is formed on PSF license, and it only uses BSD compatible code.

- What is the focus of the software?

  Matplotlib is a data visualization library which has many platforms, and it is plotting library for the Language 'Python' along with that Matplotlib has numerical extension 'NumPy'. It is a broad library which focuses on creating interactive visualizations in python. Its focus has been to make plotting easy by just writing a few lines of code to generate a visual data plot.

- Does it have interactivity, and how easy is it?

  Matplotlib has interactivity which we studied in earlier classes by creating sliders, buttons and many more which was relatively easy to learn and apply. Other than that, there are many ways to create interactive plots using ipywidgets interface. When the interactive mode is on, the plots will automatically be updated with the changes. Its interactivity is relatively not that easy when it is compared to Bqplot and other techniques.

- What are the pros and cons of using it?

  Pros: It is free and open source which is an easy alternative to MATLAB. It is a multi-platform data visualization library. It makes plotting easy and even hard things are possible using matplotlib. It can be used to insert plots and graphs in GUI applications. It is also adaptable to many operating systems, and it gives the output in any format we wish. Its also easy to see the data property when analyzing.

  Cons: The object-oriented API of matplotlib is more difficult to use in comparison to pyplot which is why pyplot interface is most used even after matplotlib interface being more powerful. There are new tools like 'ggplot' in R which have better style and interface which makes matplotlib look a bit old.

BQPLOT:

- What is the license for the software?

  Bqplot is licensed under Apache 2.0 license.

- What is the focus of the software?

Bqplot is an interactive plotting library which mainly focuses on giving their users an easy and organized way to create complicated interactions and build a fully interactive web application in Python with very less lines of code. Bqplot wants to focus on better user interactions.

- Does it have interactivity, and how easy is it?

  Yes, bqplot has interactivity and it is bqplot's priority to keep interactivity over any other feature which makes it easier to incorporate it in visualizations. Every small detail in the graph is an interactive widget which means one change in one of the attributes causes changes in other functions which changes the plot itself, which is why, bqplot is mainly used as an interactive teaching way to see minute changes in function.

- What are the pros and cons of using it?

  Pros: Bqplot doesn't require any JavaScript code to make complex interactive plots. It makes interacting easy even with large quantities of data.

  Cons: There is a lot of customization which can be confusing and has to be deployed in a browser. You can run matplotlib scripts in a terminal environment but can't do that with bqplots.

D3:

- What is the license for the software?

  D3 is licensed under BSD license

- What is the focus of the software?

  D3 is a JavaScript library, and its focus is to make interactive data visualizations in web browser using HTML, CSS, etc. It aids in creating and altering web documents with data. It basically needs a different kind of skillset in comparison to other tools.

- Does it have interactivity, and how easy is it?

  D3 allows to easily add interactivity in the plots by adding interactivity to any element of the chart. It allows the user to choose the data points to visualize however they want to, which is completely based on data.

- What are the pros and cons of using it?

Pros: It uses features and conventions which already exist which allows easier implementation. D3 is completely directed by data. D3 is very fast, flexible, powerful, and dynamic as all the functions of D3 have properties which can easily alter the format, style and other components of the visualization. D3 indirectly avoids human error by making the process of visualization much efficient. D3 has a massive community so the library is constantly improved.

Cons: To use D3, we need to know JavaScript and python is the most preferred language by everyone who work with Data. D3 is hard to code at the end in comparison to other tools. It also requires web development experience. It takes more time to learn this tool as it requires certain skillset which is not that common in people working with data. There are some functions in D3 which don't support old browsers.

R Studio:

- What is the license for the software?

  R is licensed under the GNU Affero General Public License v3.

- What is the focus of the software?

  R Studio's main focus is to create free and open-source tool for statistical analysis using R. R studio wants the user to view the data, R code, plot graphs, tables and different kinds of other visualizations using in R all in one place.

- Does it have interactivity, and how easy is it?

  Yes, R studio has easy interactivity by using R markdown documents which is a platform to make documents interactive. There are packages to add interactive capabilities to normal plots using R.

- What are the pros and cons of using it?

  Pros: As discussed earlier, R studio's focus is to make it easy for users to view tables, graph, data, code all in one place at the same time. Performing statistical analysis is very efficient and there are many libraries available in R studio. R codes can run on all operating systems. We can do different kinds of machine learning operations in R, and it is constantly evolving as well.

  Cons: Python integration is not that easy. There are a lot of ways to solve the problem which might make it confusing for new users to understand which way to go ahead with. R studio is not very compatible when working with large datasets. R lacks basic security because of

which the most essential part is lacking. It does not support for 3D graphics, and it is slower in comparison to python or MATLAB.

PART-2

Github.io page URL: https://tanvishah98.github.io/