Assignment 3: Theme River
Due: 11-2-2016, 11:59pm (midnight)

Visualizing and analyzing time series data is important for many domains including finance, medicine, climatology and history. In this assignment, you will be using d3 to parse a time-series dataset and visualize the changes over time by using a ThemeRiver. This is your first assignment in d3 and you will be learning the basics of d3 such as, loading and interacting with data. You may write everything from scratch, or start with demo programs from books or the web. If you do start with code that you found, please identify the source of the code in your README and, most importantly, make non-trivial changes to the code to make it your own.

Basic Requirements for This Assignment:
1. Create a time-series dataset. This file should have the following properties:
    a. You will likely use the [d3.json or d3.csv](#) functions to load your data, so the file should be a simple csv or json file. Beware that these functions are asynchronous, meaning it's possible to "build" an empty visualization before the data actually loads.
    b. The data format should be exactly the same as the format from assignment 1 (Bar and Line Charts), except that there are now more than 2 columns. This time, the number of columns should be the number of time steps in your time-series data (plus the first column for the name the nominal or ordinal data dimension)
    c. Keep in mind that just like assignment 1, the first row should be labels.

2. In d3, do the following:
    a. Load the data.
    b. Layout the data using the stack layout. A tutorial for the themeRiver in d3 can be found here: http://d3-wiki.readthedocs.io/zh_CN/master/Stack-Layout/.
    c. Don't forget to add the x-axis and mark it appropriately with the time steps.
    d. As usual, this program needs to be dynamic. It should handle a dynamic number of streams, as well as a dynamic number of time steps in the time-series data
    e. Implement mouse-hovering. When a user moves the mouse over a stream, display the name of the stream, the closest time step value, as well as the data value at that time step. This should be done in the format of (NameOfStream, timeStep, value).

Notes and Extra Credit Opportunities:
1. When grading your assignment, I will be using a different input file that I will create.
2. Don't forget to run a local webserver when you're debugging. See this [ebook](#)if you're stuck.
3. You may complete this assignment individually or in pairs (see rubrics below).
4. I will be more than happy to give out extra credit for novel and creative designs. So feel free to experiment and add features to your assignment! Some suggestions include but are not limited to:
    a. Allow the user to re-order the themes in real time.
    b. Consider the aesthetics of the layout and play with different parameters to make the ThemeRiver look more interesting. For some inspiration, see Lee Byron's work on Stacked Graphs (http://www.leebyron.com/else/streamgraph/download.php?file=stackedgraphs_byron_wattenberg.pdf)

    c. Design and implement other techniques for interacting with the ThemeRiver. Explain why you think this interaction technique could be helpful.

    d. Use current, real-world data, write a brief report of any interesting findings and present these findings in class.

Submission:

1. Submit your work via **Blackboard** by Wednesday November 2, 2016, 11:59pm (midnight). Use the naming convention: "FirstnameLastname_a3" (e.g., AlvittaOttley_a3).
2. If you are working with a classmate, let me know ASAP who you are working with.
3. In addition to the source code, you must submit:
   a. The data file that you have generated/found. Name this file "data.csv" or "data.json"
   b. A text file that tells us where you have posted your assignment online (the URL to your applet). Name this file "location.txt"
   c. A text file that tells us any extra credit that you might have implemented. Name this file "extracredit.txt".

Need Help?

If you have questions about this assignment:

1. First, check Piazza to see if others have had a similar problem.
2. If not, post your question on Piazza.
3. If the question is sensitive, please email the instructors privately.
4. Note that you are NOT allowed to post code or solutions on Piazza – I will monitor the forum and delete any inappropriate posts. Fishing for programming solutions could result in a penalty toward your grade.

Rubric (Individual):

You will be graded based on how you address the following:

1. 5 pts: When unzipped, project runs without errors or modifications on my part
2. 5 pts: Loads included data file
3. 30 pts: ThemeRiver displays data from file and x-axis labeled scaled correctly
4. 20 pts: Hovering implemented

Extra Credit

1. 20 pts: Uses current, real world data, data analysis and presentation
2. 20 pts: Can reorder themes in real time
3. 10 pts (each): Designed and implemented other techniques for interacting with the ThemeRiver
4. 20 pts: Non-trivial ThemeRiver redesign (beyond using stack.offset() function)

Rubric (Group):

You will be graded based on how you address the following:

1. 5 pts: When unzipped, project runs without errors or modifications on my part
2. 5 pts: Loads included data file
3. 30 pts: ThemeRiver displays data from file and x-axis labeled scaled correctly
4. 20 pts: Hovering implemented
5. 20 pts: Uses current, real world data, data analysis and presentation

6. 20 pts: Can reorder themes in real time
7. 10 pts: Designed and implemented one other technique for interacting with the ThemeRiver

Extra Credit:

1. 20 pts: Non-trivial ThemeRiver redesign (beyond using stack.offset() function)