

Homework 2

D3 Graphs and Visualization

Due: Friday, February 21, 2014, 11:59PM EST

Prepared by Robert Pienta, Tran Quoc Long, Polo Chau

Submission details: Submit each deliverable as a separate attachment on the T-Square submission site with the **specified file name**. In case you have collaborated with other students on this assignment, please specify the name(s) of your collaborator(s) in the text box present on the t-square submission site. **Don't wait until the night before!!! Start early.**

Q1: Force-Directed Graph Layout in D3 [65 pts]

You will experiment with D3 to make some interesting graph visualizations; you will work on multiple aspects of a D3 graph visualization. We have provided some *working initial code*, a html file called `miserables_graph.html`, for you [here](#). Each node of the graph represents a character from Victor Hugo's *Les Misérables*. This code requires a json data file as the input, which describes the graph's edges, nodes and their attributes. Download the json file [here](#).

1. [10 pts] **Adding node labels.** Modify the html to *show a label* to the right of each node in the graph. The label should be the name of the character that node represents. If a node is dragged, its label must also move with the node.
2. [10 pts] **Coloring nodes.** Color the nodes based on the "groups" field provided in the json file (i.e., all nodes from the same group have the same color). You *get to choose the colors*. The goal is to make the groups visually distinguishable from each other. We suggest using a color scheme (can be grayscale) that also works for people with colorblindness. ([Hint](#) and [color brewer](#).)
3. [20 pts] **Scaling node sizes.** Adjust the radius of each node in the graph based on how "cool" each character is. In the provided json file there is a "coolness" rating for each character.
 - a. [5 pts] Use this rating to scale the radii of the nodes *linearly*. This means cooler characters (higher score) will be represented as larger nodes. Take a screenshot of the whole graph with linearly scaled node size (Polo recommends [Skitch](#) for taking screenshots).
 - b. [5 pts] Now scale the radii by the *square root* of coolness scores. Take a screenshot of the whole graph with square root scaled node size.
 - c. [10 pts] In fewer than 40 words, discuss which approach works better for this problem and why. Place this response in **short_answers.txt**.
4. [10 pts] **Filtering node labels.** Only show the labels for "cool" characters. Only draw

labels for the characters with coolness factor above 25 (i.e., coolness > 25). What do you think about the new appearance in comparison with the old one ? Place this response in **short_answers.txt** (less than 40 words, after response for Q1.3-c).

5. [10 pts] **Pinning nodes (fixing node positions)**. Modify the html so that when you double click a node it fixes the node's position. Mark fixed nodes so that they are visually distinguishable from unfixed nodes, e.g., pinned nodes shown in a different color, or border thickness, or visually annotated with a "star" (*), etc. The rest of the nodes' positions should remain unfixed. Double clicking a fixed node should unfreeze its position and unmark it.
Hint: the easiest way to do this is to add a doubleclick event-listener to the nodes.
6. [5 pts] Streamline the visualization by making it easier to read the text labels. There are several possible routes to making the text more readable (Hint: balancing font size and the graph layout parameters to reduce clutter).
 - a. [3 pts] The changes you make should be included in the final version of **miserables_graph.html** that you turn in.
 - b. [2 pts] In 40 words or fewer tell us what you did to make your graph less cluttered. Put your response in **short_answers.txt** after your response for question Q1.4.

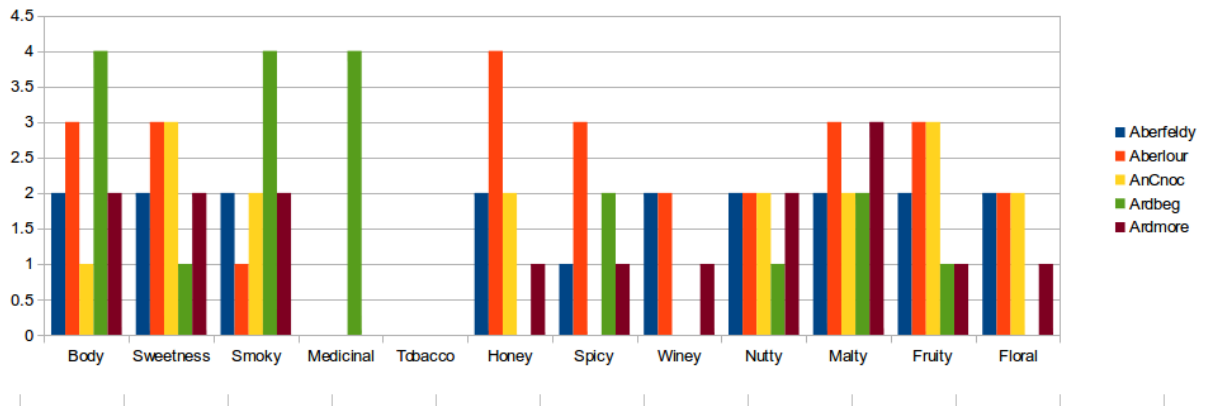
Q1 Deliverables:

- **miserables_graph.html** - the html file based off our initial code that contains the changes made in 1-6 above.
- **short_answers.txt** - the text file containing your short answers for Q1.3-c, Q1.4, and Q1.6-b, keep it short and concrete (each answer should be less than 40 words).
- **linear_nodes.yyy** - a png or jpg screenshot of the linearly scaled nodes from Q1.3-a.
- **squareroot_nodes.yyy** - a png or jpg screenshot of the square root scaled nodes from Q1.3-b.

Q2: Visualize the Qualities of Whisky Distilleries [55 pts]

- [5 pts] Download [this](#) dataset, a comma separated text file, that describes the different qualities of whiskeys made in 86 different distilleries. Convert this file into a json file. This can be done by hand or with a script of your choice. **Transfer every bit of data from the text file to your json file.** Only the json file will be graded so you don't need to turn in the script.
- [20 pts] **Using D3**, create a bar chart comparing the various qualities of whisky covered in the dataset. For each distillery there are 12 distinct qualities drawn from expert ratings. Pick any 5 distilleries and use the side-by-side bars to visualize the differences in whisky flavor. Each distillery should have its own bar graph. An example is provided below to show the **side-by-side bar layout** we would like you to use. For all other characteristics of the chart, apply what you have learned from class (see [lectures slides](#)) to come up with an effective design that is easy to understand and visually pleasing. (e.g., include axis labels, choose a good color scheme, etc.)

You will use your json file as input. The exact choice of colors (can be grayscale) and size is up to you. Explain your choices in **explanation.txt** in fewer than 40 words.



- [15 pts] Make a table to display all of the data in the json file from Q2.1. Keep the suggestions from class in mind when designing your table (see [lectures slides](#) for what to and what not to do). You **can use any tool** (e.g., Excel) you want to create the table. However, remember that you are presenting important data and you want to **convey them clearly** to the reader as they are insanely selective in their choice of whiskies. Discuss the techniques you use to present the data in **explanation.txt** in fewer than 40 words.
- [15 pts] **Using D3**, construct a creative visualization that compares 3 different distilleries of your choice simultaneously. This means you can have one large visualization or multiple small ones, as long as you can compare among the 3 distilleries' qualities. You may pick any 3 distinct distilleries and statically visualize them. (The visualization does

not need to provide any interactive means for the user to select which 3 distilleries to compare.)

- **Do not turn in a regular (boring) bar graph or table.** The point of this task is for you to take a design idea you've created yourself and implement it in D3 as best you can. Points will be awarded for functionality, and also for interesting ideas.
- You need to compare all 12 of the aforementioned qualities.
- Discuss the brilliant idea that you come up with in order to make this creative visualization in **explanation.txt** in fewer than 40 words.

Q2 Deliverables:

- **distilled.json** - The json file created in Q2.1
- **bar.html** - The html and javascript to render the bar graphs requested in Q2.2.
- **table.yyy** - Any modern image format (e.g., jpg, png, pdf) showing the table in Q2.3.
- **comparison.html** - The html and javascript to render the comparative visualization made in D3 for Q2.4.
- **explanation.txt** - Explanation of the choices you made in answering the questions Q2.2, Q2.3 and Q2.4, keep it short and concrete.