Lab 7: Putting It All Together

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Time to build your own vis from scratch

This final programming assignment of the term is a more open-ended data visualization challenge. We have identified a collection of potential datasets for you to visualize (in the `data` folder for lab7). You should select one, then design and implement an interactive visualization of the data.

Note that there is no starter code for this lab. You are welcome to use code from your previous assignments, or start from scratch. Please name your folder that you use for this lab `lab7`.

Because you do not have an extended period of time to work on the project, we recommend that you quickly select one of the datasets. Next, you should come up with a design for your visualization. To do this, think about the kinds of questions someone might have about the data and the kinds of insights they'd want to take away from your visualization. For visualizations that are more about analysis and exploration, remember the analytic tasks that we have been discussing all semester. Make sure your visualization supports many of them. If you are doing more of a storytelling visualization, then think about the aspects of the data and "messages" that you want to communicate. Don't spend too long working on your design, however, because it's important that you leave enough time for the implementation. Feel free to meet with the TAs to run design ideas by them for early feedback and thoughts.

You must implement your visualization for the web, using D3 and Javascript. Feel free to use other libraries that may be helpful to you. Where applicable, leverage the visualization design paradigms and techniques that we have learned about this term (e.g., overview and detail, dynamic queries, brushing and linking, various visualization techniques, etc.) In terms of complexity, fidelity, and depth, we're looking for something on this assignment along the lines of other visualization we have demo'd in class. We are looking for interactivity, potentially multiple views, and an overall design that adheres to principles that we've covered in this course.

Each dataset has a reasonable number of data cases and attributes. Important: You do not need to use every attribute included in the data set. It is up to you to select which attributes you want to include to make an effective visualization. We would prefer, however, that you do utilize all the data items in your visualization, and to consider if removing variables still gives you a good sense for the dataset. Also, interactivity may reveal more data attributes. However, your visualization should have ample complexity to perform a number of user tasks.

What to turn in

You should create a zip file and turn it to Canvas. In the folder that you zip up, you should also include a file named `description.pdf` that is a short project overview document. The document should be about 3 pages and include the following items: dataset chosen, list of analytic tasks it supports, design overview (1-2 paragraphs, including analytical questions and/or communicative objectives about the data), screen shot(s) of the user interface, and a description of any aspect of the interface/visualization that you feel needs explanation. It's OK for your document to be longer if you include a lot of figures.

Grading

The following questions will be important for our evaluation of this assignment.

- Does the system work? I.e., does it read in the data and present an interactive visualization of the data? Is it usable and comprehensible? Does it not crash?
- Is the visualization an effective representation of the data? Is it clear and useful, and does it effectively communicate different aspects of the data?
- Does the visualization support different analytical questions and/or communicative objectives about the data? These objectives should be made clear in the description.pdf file you submit.
- Does the visualization effectively apply the ideas we learned all semester? Does it follow good visualization design principles?
- Does the visualization exhibit some creativity? While we are not expecting totally innovative new representations, we are looking for visualizations that show novelty compared to existing visualizations that you've created for this course. Go beyond simple scatterplots or bar charts. "Going beyond" here could mean in terms of the presentation method (e.g., storytelling), interaction (e.g., powerful multi-attribute filtering/dynamic querying), or visual representation (e.g., a creative new way to map data values to visual glyphs).

Tips for a Successful Vis

We highly recommend that your vis be implemented in one of three potential styles, as described below.

The first style of successful vis might be the "Scrollytelling" type of webpage that has a long vertical narrative with a number of interactive visualizations embedded onto the page. Here, you should feel free to follow a more narrative, storytelling style of project where your visualizations are accompanied by text and images to help communicate interesting aspects of the data set. A few examples of this style of visualization include:

- Americans are Completely Addicted to Trucks
- Street Names
- California's Getting Fracked
- MBTA Data

The second style involves a visualization system that likely has only one view/representation (or perhaps a couple) but this representation is a new and innovative technique or visual metaphor. Here, you should focus on designing a creative new visual representation. The actual user interface may have different components or pieces, but it should be tightly integrated. The real focus here is on creativity and innovation. A few external examples of this type of project are:

- MLB Team Values
- Commuting in Boston
- Human Microbiome project
- Movie revenues

The third and final type of successful vis employs multiple coordinated views where each view may use some well-known visualization techniques, perhaps customized a little for this problem. There is likely nice filtering and interactive selection and focus in in the interface. The emphasis in this type of project is to create a sound, functional system implementation that clearly can be of help for data analysis and understanding. It is important in this type of project to have coordinated views that work well together and provide different perspectives on the data. This type of project does not have the same level of visualization innovation as the second one above, but it comes together in a strong system implementation. It is really more of a software engineering effort. A few external examples of this type of project are:

- Basketball stats
- Home equities
- Infectious diseases
- NY City School data

Symptoms of a bad vis to submit for this assignment

One way to carry out a poor project is to implement a series of different views, where the views have relatively little to do with each other. Systems like this usually have an interface where the user picks one of the views, and then that view takes over the window or screen, having very little to do with the other views. We don't consider this to be a very good example of an effective information visualization. Another poor project style is one where the tool has a lot of functionality (menus, controls, etc.), but none of them really help people perform the tasks the tool is intended to help with. In CS more broadly this is often called "feature creep", and it can easily happen in vis also. Finally, there is the over-simplification of the data and the visualization, usually resulting in a static view that has minimal interaction, and thus supports only a small number of tasks (and even those not very well). Keep these in mind, and don't do them.

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Clone this wiki locally

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https://github.gatech.edu/CS4460/Spring21-Labs-PUBLIC.wiki.git
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