CSC_51052 (formerly INF552) - Individual Projects

Students are evaluated based on the results of individual projects, and to a lesser extent on their achievements during petite classe sessions.

1. Project Milestones

Based on the individual project, I evaluate the theoretical knowledge and visualization design skills that you will have acquired during the course. Individual projects start early during P1 (right after the first session), with the following milestones:

- M1: by session 03, identify a dataset (or collection thereof) that you are interested in visualizing (based on your own interests), and validate it with me (just a sanity check to confirm feasibility); you can use the catalogs and search engines referenced on slide 9 of the course slide deck (CSC_51052-2024-course-s01.pdf) to search for data, or use any other means; upload this description on Moodle using the Individual Project M1 assignment.
- M2: have at least one discussion with me during a flipped classroom session, about what your project is about and what you plan to achieve;
- M3: submit a short report along with a runnable demo (ZIP file or Web link), or a video, or screenshots of your individual project. An assignment will be created for this on Moodle, with a **hard deadline on December 20th, 2024**.

2. Choosing Dataset(s)

Milestone 1 comes early (mid october) to ensure that the dataset or collections datasets you choose for your project feature sufficient richness to enable you to create meaningful visualizations. One important thing to consider is that the number and variety of *dimensions* matters more than the number of rows/items in the dataset. The data having a variety of attributes -- mixing nominal, ordered, quantitative, geospatial, temporal data -- will provide more opportunities to design interesting visualizations than, say, a table with millions of rows but only three or four quantitative data columns that are fairly homogeneous. Those can be challenging to visualize as well, but you will likely have less opportunities to demonstrate the skills you have acquired during this course. Datasets structured as graphs or trees can also yield good opportunities. Datasets featuring uncertainty in the data as well (we cover the visualization of uncertainty in session 4).

3. Expectations and Evaluation Criteria

The individual project is really about the design of a visualization. You may write code to create it (D3, Vega-Lite, ggplot2, matplotlib, anything else), or use dedicated software such as Tableau, or even draw it on paper. There are no restrictions about how you create the visualizations for this project.

You can work alone, in pairs, possibly larger groups, up to three students. I will obviously have higher expectations from projects depending on how many students are involved.

The following criteria are considered when evaluating your project:

- In the project report: a design rationale for the visualizations you have created, grounded in what we have seen in the course (both live lectures and videos).
- In the project overall, and related to the above: fatal design mistakes (ignoring what we have seen in the course) are obviously to be avoided. Examples: ill-defined mappings between data attributes and visual encoding channels; immoderate and innapropriate use of rainbow color scales or pie charts, *etc*. In that respect it is important to have followed all course sessions, including the videos for sessions organized as flipped classrooms.
- How elaborate are the visualizations from a design perspective. Is there enough richness and variety in the visualizations produced. Can interesting insights be gained about the data from those visualizations? Selected projects from last year (linked below) are here to give you a sense of what I consider to be a good project.
- Beyond regular statistical charts and maps, more advanced representations that, for instance, convey information about *uncertainty in the data*.
- How elaborate are the visualizations from a software development perspective: data preprocessing; effort spent developping the visualizations themselves (as opposed to using, *e.g.*, Tableau, that does not require writing any code at all); developing interactive visualizations.
- Overall report quality, including supplemental material, if any (demo, video, ...)

A given project is not necessarily expected to rank high on *all* these criteria. Some projects will put more emphasis on the design aspect and insights gained by visualizing the data, others will rather be focusing on the technical realization. When using software such as Tableau, which make a lot of design decisions for you, it is still important to rationalize the design choices made, grounded in what we have seen during the course (in other words, explain why Tableau made those choices in terms of chart type and visual mapping strategy). Obviously, when using such software, my expectations are higher in terms of the number and elaboratness of the overall project given that no or close-to-zero time will have been spent on software development.

Sample individual projects from last year are available: 1-2, 3-4, and 5-6.

3. Report Submission

The report is expected to be approximately 4-5 pages long (text). Illustrations are not considered in this page count, since page length will vary depending on how many illustrations you include. Elements expected in the report:

- A description of your dataset and purpose of the visualization(s) that you have made.
- A short technical description of how the visualization(s) were developed
- A description of the *design* of your visualization and its features (interaction). It is **very important** to provide a rationale for the main design choices that you make as the visualization *designer*. When using tools such as Tableau, that make a lot of (usually sound) design decisions for you, I still expect you to provide an explanation about, *e.g.*, why the tool decided to use such and such visual encoding channel to represent such and such dimension in the dataset, or why a given visualization technique in particular is more appropriate than other options.
- Illustrations of your work.

Upload your assignment on Moodle by 2024-12-20.

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