DATA 22700 Spring 2023

Assignment 1: Visualization design

Due April 3, 2023

In this assignment, you will design a visualization for a small dataset and provide a detailed rationale for your design choices. In theory, students should be ready to explain the contribution of every pixel in the display; in practice, students are expected to explain choices about elements of the grammar of graphics such as marks, encodings, scales, labels, and annotations. Students may use any graphics or charting tool they please–including drafting a visualization by hand. However, students may find it most instructive to create the chart from scratch using a graphics API of your choice.

Students will *work alone*. We will be discuss submissions in class.

Students should submit their assignment as a PDF document on Gradescope.

Antibiotics data

After the World War I, antibiotics were considered as "wonder drugs", since they were an easy remedy for what had been intractable ailments. To learn which drug worked most effectively for which bacterial infection, performance of the three most popular antibiotics on 16 bacteria were gathered. The numbers in the table represent the minimum inhibitor concentration (MIC) a measure of the effectiveness of the antibiotic. Specifically, MIC represents the concentration of antibiotic required to prevent growth in vitro. The reaction of the bacteria to Gram staining is described by the covariate "gram staining". Bacteria that are stained dark blue or violet are Gram-positive. Otherwise, they are Gram-negative.

Technical specification

Students' task is to design a *static visualization* (i.e., single image) that they believe effectively communicates this data and provide a short *write-up* (no more than 4 paragraphs) describing their design. While students must use the dataset provided, they are free to filter, transform, and augment the data as they see fit to highlight the elements that they think are most important in the dataset.

As different visualizations can emphasize different aspects of a dataset, students should document what aspects of the data they are attempting to most effectively communicate. In short, what story (or stories) are they trying to tell? Just as important, also note which aspects of the data might be obscured or down-played due to the visualization design.

Write-ups should provide a rigorous rationale for students' design decisions. Document the visual encodings used and why they are appropriate for the data. These decisions include the choice of mark type, encodings, scales, and other visual elements, as well as use of sorting or other data transformations. How do these decisions facilitate effective communication?

Be sure to include a short description of the tools you used to create the visualization.