DATA 23700 Autumn 2025

Assignment 2: Color and cartography

Due October 27, 2025

In this assignment, students will use Altair in a computational notebook to develop a series of maps and provide detailed rationales for their design choices. The purpose of this assignment is to focus on design choices related to color scales and cartography, so special emphasis will be placed on these design choices.

Students will *work alone*.

Students should submit their assignment as an ipynb file on Gradescope. Be sure to evaluate all code blocks so the desired output you would like to submit is showing. Otherwise, your submission may appear to be incomplete when the course staff evaluates your work.

Dataset: Illegal animals kept as pets

In this assignment students will explore and answer questions about a particular dataset using Altair. Specifically, students will investigate the Illegal Animals represented in the NYC 311-calls dataset. 311 calls are a matter of public record and so are recorded and made available to the public.

Although a live verions of the dataset can be found at NYC Open Data *we ask that students download and use a snapshot of the dataset captured by the course staff and uploaded on the course website.* The reason for this is so that the course staff can grade student visualizations by checking them against a reference solution (which will not work if students and instructional staff are using different versions of the data).

Note that students will need to supplement this data with geoJSON data for New York City (NYC) and other demographic data for NYC Boroughs, which can be found online. Finding these supplemental datasets will be good practice for the project!

Technical specification

Using Altair in an iPython notebook, answer the questions about the dataset listed below. *Each answer should be expressed as a map or small multiples of maps* rendered using Altair. What is encoded in each map should be unambiguous and should clearly answer the question.

1. What type of animal is most commonly kept as a pet in each NYC zip code?

2. What is the rate that each species is reported as appearing in each Borough relative to the number of people who live in that Borough? (Hint this will require acquiring an additional dataset).

3. What is the ratio of complaints filed on the phone vs online per zip code and type of animal?

Students will produce one visualization per question above. ***Students may not use any kind of visualization other than a choropleth map, and all visualizations submitted must be static*** (i.e., not interactive or animated). The purpose of this restriction is to challenge students to think about the appropriate use of color, and to present design puzzles in which position encodings (i.e., x and y) are off limits because they are occupied by latitude and longitude coordinates. Use of small multiples (e.g., through Altair's `repeat` or `facet` operations) is encouraged. ***Students should use one sequential, one categorical, and one diverging color palette.*** Choosing the right color palette for the data type encoded in the visual is important.

Each map should be preceded by a recap of the question it is answering and should be followed by a markdown text block containing a short write-up about the design choices in the map. Write-ups should provide a rigorous rationale for students' design decisions, especially design choices pertaining to color scales, label placement, level of geospatial aggregation (e.g., zip code vs county vs state), and map projections. Document the visual encodings used and why they are appropriate for the data. How do these decisions facilitate effective communication? How to they answer the question that prompted you to create each map?