

CS 503 – Data Visualization

Assignment 3: Exploratory Data Analysis and Interactive Visualization

1. Introduction

In this assignment, you will design **three interactive visualizations** techniques for a challenging dataset and provide a rigorous rationale for your design choices.

2. Tasks

The dataset contains some important information about flights among the states of the United States of America in 2009.

Step 1. **Pose an initial question** that you would like to answer as you did in the assignment 2.

Step 2. Assess the fitness of the data for answering your question.

Inspect the data--it is invariably helpful to first look at the raw values. Does the data seem appropriate for answering your question? If not, you may need to start the process over. If so, does the data need to be reformatted or cleaned prior to analysis? Perform any steps necessary to get the data into shape prior to visual analysis.

Step 3. Design three interactive visualization techniques that you believe effectively communicates the data and provide a short write-up (no more than 4 paragraphs) describing your design. This design must be implemented in Python with the help of the interactive visualization library [Plotly](#). While you must use the data set given, note that you are free to transform the data as you see fit. Your chart image should be interpretable without recourse to your short write-up. Do not forget to include title, axis labels or legends as needed!

As different visualizations can emphasize different aspects of a data set, you should document what aspects of the data you are attempting to communicate effectively. In short, what story (or stories) are you trying to tell? Just as important, also note which aspects of

the data might be obscured or down-played due to your visualization design. In your write-up, you should provide a rigorous rationale for your design decisions. Document the visual encodings you used and why they are appropriate for the data. These decisions include the choice of visualization type, size, color, scale, and other visual elements, as well as the use of sorting or other data transformations.

3. Submission

You must submit the *pdf* file of your report. In fact, it must contain the illustration of your visualization technique in term of images (three images that illustrates three visualization techniques) and a rigorous explanation. Indeed, your explanation must justify which one of the three visualization techniques will help the reader to give a relevant interpretation. The use of a multidimensional visualization (3D, 4D, etc.) technique will be an asset. In addition, you have to submit your *.py* or *.ipynb* if you prefer using *Jupyter Notebook*. **Please, do not submit your assignment in .zip or .rar files.** If you do a transformation to the dataset, you will have to mention it on your report and to submit it.