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Project 3 – Description

The Data

For our visualizations we compiled, organized, and cleaned data from 2 different sources:

1. For Transportation data we used Savage's research data from table 2 of "Comparing the fatality risks in United States transportation across modes and over time" (http://faculty.wcas.northwestern.edu/~ipsavage/436.pdf)
2. For Plane Crash data we used David McCandless' data of fatal commercial plane crashes from 1993-2015 (http://bit.ly/KIB_PlaneTruth)

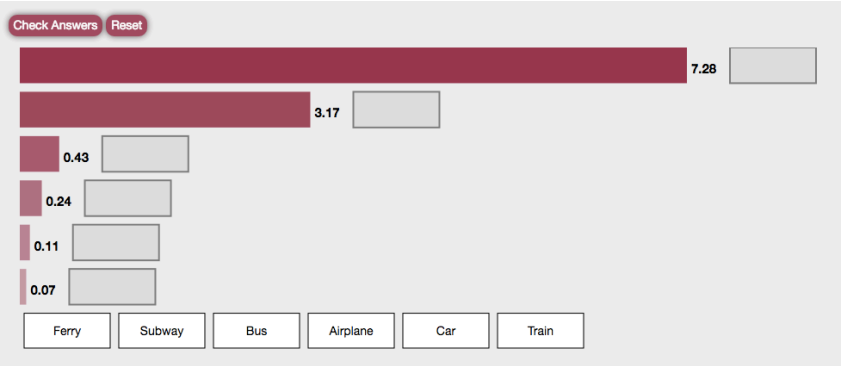
We also used the state.json file to create/draw our maps. After collecting the data, this is how we cleaned and compiled them for our visualizations:

- For **transportation_data.js**, we had variables "mode" (which included the different types of transportation modes" and "fatalities" (which consisted of the number of deaths per 1 billion passenger miles).
- For **cause_data.csv**, we took all the flight crash data, filtered by year, and then added up the total number of fatalities per type of cause for each year. We have the following variables: "year", "mechanical", "human_error", "criminal", "weather", "unknown", and "replace" (which is a column of zeros to help ensure that in the graph, only one variable disappears when its icon is clicked).
- Finally for **phase_data.csv**, we again filtered by year, and then added up the total number of crashes that occurred in each phase for that year. We have the following variables: "year", "approach", "en_route", "grounded", "initial_climb", "landing", "take_off", and "unknown". We also include the total fatality counts for each phase at the end of the file.

The Story: Mapping to Visual Elements

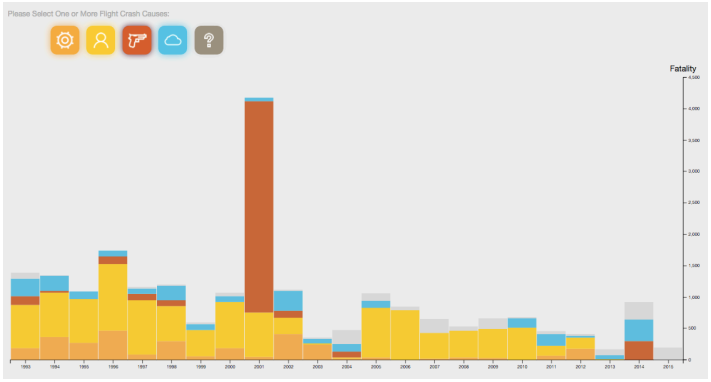
Our story focuses on the safety of traveling which narrows down specifically into the dangers of transportation by airplane.

We were interested in seeing if there were major changes in crime rates for the US over the years. For our first visualization, we drew a horizontal bar graph where each bar represented the number of deaths for a different mode of transportation (although they are not labeled). We put the raw value (number of deaths per 1 billion passenger miles) at the end of each bar as well as a gray box. Along the bottom of the graph, we put



labels with the different modes of transportation. Users can drag and drop these labels into the gray boxes, trying to match the mode of transportation with the correct bar of the graph. They can then check their answers with the "Check Answers" button to see which ones they got wrong (turns red) or right (turns green) and view the correct answers (which appear in green next to each wrong answer). This game like interactivity is meant to (1) engage users when they first land on the page and (2) get them thinking about which modes of transportation are more dangerous than others. *Data Used: transportation_data.js.*

After seeing just how "safe" airplane travel is (as it had only 0.07 deaths per billion miles compared to 7.28 for cars), we wanted to get a better idea of what actually causes plane crashes. To do this, we found data that had information about all commercial plane crashes from 1993-2015. We created a stacked bar chart to display the number of fatalities that occurred each year due to the different types of causes: mechanical (orange), human error (yellow), criminal (red), weather (blue), and unknown (gray). Users can then click on the different icons representing each type of cause to select/filter which causes they want to look at. *Data Used: cause_data.csv.*



For our third visualization we were interested to see what other factors go into plane crashes. We decided to look at the different flight phases and how that impacts the number of fatalities that occur as well as the number of crashes. To do this, we first start off with an animation that shows the general course a plane takes over the duration of a normal flight (this starts when the user presses the play button). This is to help the user understand what each of the phases (take off, climb, route, approach, and landing) are and what each looks like for the plane. The user is then shown bars

representing the total number of fatalities that have occurred in each phase from 1993-2015. The user can click on each bar to see a line graph that displays the total number of crashes that have occurred in that phase over the years. *Data Used: phase_data.csv.*