CS 3300 Project 2: Interactive Data Visualization

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Description of the Data:

When looking for datasets, I found four different datasets involving nutrition that I felt would go hand in hand with the purpose of this project. The first data set includes every single item on the McDonald's menu including their nutritional facts, ranging from everything from the type of item and the food category to the item's actual number of sugar content in grams and sodium content in grams. The second data set includes data from the Center for Disease Control concerning data on adults' diets, levels of physical activity, and weight status differentiated primarily by state and the year the study was conducted. The third data set simply lists the national obesity percentages categorized by state, and the final dataset obtained from the Internet details a 500 person study of people's gender, height, and weight distribution used to calculate their body mass indexes. On top of these datasets, I did create a fifth one listing out the questions and answer choices for the personalized survey presented at the beginning of the simulation.

For the purposes of this project, I did not manipulate or filter the datasets concerning the menu items, the BMI indexes, and the state obesity levels not only because they were relatively straightforward, but also, for example, in the case of the menu, if I wanted to use more nutrition variable to compare, I'd have the option to add onto the visualization. Moreover, I did most of the data filtering on the nutritional dataset coming from the CDC because it was overtly large and had too many unnecessary variables. For example, this particular dataset showed state obesity and overweight percentages varying in age, education, income status, and race as well as considered their exercise habits. However, due to the limited capacity in time, I decided to make my visualization comparisons mainly on gender primarily because I had another data set dealing with body mass index, so the two go hand-in-hand. From there, I further filtered out the data to include only the year 2016, deal with weight classifications only, and for it to focus on the continental United States and not its territories. Finally, in using these datasets, I converted the xlsx files to csv files, and once more I converted them to deal with json files instead.

Data Source Links:

- https://www.kaggle.com/mcdonalds/nutrition-facts
- https://www.kaggle.com/spittman1248/cdc-data-nutrition-physical-activity-obesity
- https://catalog.data.gov/dataset/national-obesity-by-state-b181b
- https://www.kaggle.com/yersever/500-person-gender-height-weight-bodymassindex

Design Rationale:

Personalized Survey

In the first part of the simulation, the user is presented to fill out a personalized survey that would gather its gender, state of origin, height and weight so that it would be later used in the final nutritional comparison visualization. For this part of the project, I iterated through the questions.json

file, appending labels and inputs for each choice, and upon the user's click of a choice, the function used here would not only be called iteratively so that it would move onto the next question until the user was done, but it also appended the user's choice into an array that would later be indexed to perform BMI index comparisons. Furthermore, in this question I did the calculations in the else statement of this function, which will be discussed later in this document, but I simply appended divs to the end of the user interface and kept it hidden until the user notified that he or she was completing picking their items off of the McDonald's menu.

McDonald's Menu

This visualization is where the majority of the code for my project stems from. The menu is attached to the same container the personalized survey is kept in. However, just like the final nutritional breakdown graphic, I made the choice to keep it hidden until the user has finished inputting his or her personal information.

With the menu's visualization in particular, I created one svg element in the html file and the rest I appended through javascripts because I needed a way to have each other the images used in the svg render, so I did that by calling those within definitions and patterns, giving them certain dimensions as well. The biggest concern I came across while making this menu visualization was the way I was going to manipulate the svg. For context, I first created food categories by filtering the dataset by Category and creating a new set by filtering each category down so that I would only have to iterate through the unique menu items within each category. To implement this, I used multiple data joins to create circles and text for each item on the menu. I initially kept each sub-svg hidden so that the user would focus on the main menu and click on the desired food category. Furthermore, I implemented a back button so that the user could seamlessly return to the main menu to pick more items. In these transitions, I decided to smooth them out so the change would not be so abrupt on the screen. Now, when designing the layout of the menu's presentation, it would be ideal for the user to stay on the same svg, but when iterating through the indexes, the data would not reset to zero for each new item in a new set because they come from the same dataset. As an alternative, in order to provide the best possible visualization, I decided to toggle the visibility between the svg's upon clicking and append a new sub-svg for each food category.

In terms of aesthetics and the functionality of the menu, for the main menu, upon hovering over each category, the user would know the category was clickable and once clicked, it would toggle the visibility of the sub-menu clicked to visible. In order for the user to know the menu items were clickable, I made the stroke of the circles larger to highlight them upon hovering. And upon clicking each of them, I changed the image inside from the McDonald's menu to a check mark to let them know their choice was rendered and would not click again. Finally, when each item was clicked, I created a function to add the amount of calories, protein, fat, sugar, carbs, and cholesterol of each item to the total number of each nutrition variable, where the calories were displayed at the top and the other nutrition variables were included in the final visualization.

Nutritional Breakdown / Personal Comparison

With the final visualization that outlines the additional nutritional elements as well as how the user compares to other males or females in their respective state based on their BMI index, I wanted to tie it in to the rest of the overall visualization, using the same fonts, color schemes, etc. that were used

throughout. However, I wanted to specifically highlight the elements that were changeable based on the user's picks during the simulation. This included showing the update nutrition statements, their weight classification (i.e. underweight, normal weight, overweight, obese), the percentages of obese and overweight people in their states, and how many people out of 100 struggle with obesity in their respective state. In doing this, I specifically made the changed values gold and/or italicized. Furthermore, I wanted to emphasize cleanliness in my design, so I separated this whole visualization into three separate sections so the user is able to focus on one purposeful/impactful statement at the time. In particular, for the third section showing the number of obese people out of 100, instead of doing a typical pie chart with percentages, I took one of my images representing obesity and multiplied it by the number of people and placed it underneath a statement saying whether he or she was a part of this group.

Finally, below these three sub-sections, I wanted to user to specifically know what their inputs have told them through this simulation, so I decided to include a "What You Should Take Away" statement that essentially gives the user advice on how to move forward with their health choices in the food that they may eat on a daily basis. After that statement, I implemented a button so that the user could restart the simulation without having to refresh the page.

Story:

In today's world, physical health, especially in regards to weight and body size, is something that more and more people are becoming more cognizant of. Because of that, I wanted to use this simulation that would provide a unique way of showing where they are on the health spectrum and how they should be altering or not altering their diet so that they are able to live a healthy lifestyle.

When we pick items off of a fast food menu, we often overlook its nutritional content and how it affects our eating habits. Because it is human nature to overlook this, I wanted to highlight this by using the McDonald's menu as a means to emphasize how what a user picks to eat truly impacts their health and weight in the long run. Furthermore, for McDonald's in particular, which is one of the world's top fast food chain restaurants, I wanted to show the users what nutritional content they are actually putting into their bodies each time they order from the renown food chain. What's unique about this simulation is that the results are unique to each individual because each person is most likely a different combination of gender, state of origin, height, and weight, so the results are able to give a glimpse of how he or she can navigate their choices in a meal for the future.

Team Contributions:

Due to the fact that I completed this project individually, all components of the project were done by my doing, ranging from the code design to the final report to the fixing of any bugs. In terms of the time spent developing, I roughly put in dozens of hours getting everything working, and particularly the menu/data joins took the most time to produce.

PLEASE NOTE: During testing, the "Start Over" button to restart the simulation currently works only on Google Chrome as a browser.