SARC 5400 - Data Visualization
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Trip's Future Dream Cars Breakdown

Purpose and Motivation

Given the task of creating a set of visualizations, both static and dynamic, I wanted to create visualizations that would allow me to look deeper into my life and the things that I am interested in. When I think of 'Extreme' (the word our visualizations should be connected to), my initial thoughts go straight to extreme sports. In my mind, these extreme sports revolve around cars, racing, and all of that aesthetic. As someone who has always been interested in cars, I knew that this was what I wanted to revolve my project around.

Although people may find it childish or even immature, I find myself taking interest in cars. The idea that you can get into something and get out somewhere else is interesting to me; the same goes for other modes of transportation as well. Anyways, for the scope of this project, I wanted to look into my dream cars that I would love to own or even drive in the future. These cars can include cars that I have owned in the future, cars that I currently own, cars that I can see myself owning in the future, and even cars that I cannot even imagine owning but would love to drive at some point in my life. Although not super important, doing this project was eye-opening for me and allowed me to gain insights into how I think and feel about cars. It is also interesting to see how each car is similar or different to each other and possibly get an understanding of what makes a car likable for me!

Data

As for the data itself, there are no pre-made datasets for cars that I like, so I went out and created my own. Although scouring the internet for all the information for each car was a lot of work, I was able to end with a dataset that fit my needs perfectly for the possible ideas that I had for my visualizations.

The information that I needed to collect for each vehicle was straightforward. Obviously, the car make and model were important, but for some cars the trim was also specified. It was assumed that I was only looking at cars with 2024 or the latest year that it was created. For each car, I also wanted to look up its base starting price (unless specified otherwise) and the respective 0-60 mph times (in seconds). I wanted to look at the 0-60 mph metric because this is what I define as fast. Many people like to use torque and horsepower as metrics for acceleration, but I feel like this does not include weight in the equation and therefore can be deceiving. Plus also I wanted to look into how quick the car is, as this is the metric that is used the most. Finally, I wanted to add what type of vehicle it is (SUV, Coupe, etc.) and the country of origin. These two categories were straightforward.

In the end, I was left with a Microsoft Excel file with 6 columns titled Country, Make, Model + Trim, Type, Price ($), and Acceleration (s). I had a total of 33 cars present in my dataset as well. This dataset was the foundation of all of my visualizations. I had enough columns and rows to create multiple different visualizations but also kept my dataset relatively

small and did not spend an entire week just collecting data. Overall, although tedious, I was happy with the final dataset that I was going to use for my visualizations.

Ideas

The ideas that I had mainly began during my brainstorming for the checkpoint that we had due for class a while back. Many of the sketches that I had were off the top of my head. Since that time of brainstorming, I mainly stuck with those ideas, and they did not change much. Out of the three visualizations that I provided for checkpoint 1, the second and the third remained the same and were included in the final. While sharing these visualizations with my peers, I was able to get a better idea for where I was heading and what I wanted to do. Using the mix of these two brainstorming techniques, I had a final idea (although things never work out as intended).

Preprocessing

As for the dataset itself, since I collected all of the data, I was able to pick and choose the data and values that I wanted to keep in my dataset. This meant that there was very little to no preprocessing of the data. I did create another column that would combine Make and Model + Trim together just so I could have a label for each car. This new column was called Label.

Final visualizations

My final visualization had two parts: static visualization and dynamic visualization. Each visualization was created that showed different levels of information.

For the static visualization, I utilized Tableau to create a dashboard with multiple visualizations. The one of the three smaller visualizations that made up the dashboard, the pie chart was the one that remained the same from my previous brainstorming. This pie chart shows the count of the types of vehicles that are present in my dataset to help the readers understand the types of vehicles that were part of my dream cars. The other two visualizations were ones that I created while just messing with the data within Tableau. One visualization depicts an area/box chart that represents the average price of the cars for that brand based on size. The color represents the total costs of all the cars of the brand and the label shows the count of cars. This helps to show how each brand of car present in the dataset is more and less feasible to be obtained as more expensive cars are significantly harder to purchase. The other visualization present within the static visualization is a box and whiskers plot that shows the median 0-60 mph speeds of the cars based on the country of origin. This helps the reader to understand which country's cars are faster. The reason I chose the box and whiskers plot rather than just pointing to the medians is that the box and whisker plots also show the range of values that are present as well; this can help the reader to draw better conclusions when looking at the values. To top off the total visualization, I added a picture of a McLaren P1 (my most expensive dream car) and added an appropriate title as well. Structuring out and placing each visualization to be able to be seen and read easily helps the readers to have their attention drawn but also get a better understanding of the information present as well.

For the second visualization, the dynamic visualization was much more difficult to work through and finish. I initially started in Observable and utilized D3, but after days of struggling, I was unable to get anywhere. My initial response was to just try something else, but this

visualization was the one that I was looking forward to. Instead of quitting, I attempted to create my intended visualization in Python using Jupyter and the pandas, dash, and plotly libraries. Using Python was also a challenge, but after a couple of days of working, I was able to successfully implement the visualization that I had in mind. This visualization plots each car on the axes of price (x-axis) and 0-60 mph times (y-axis). Each point represented a car. Each car was also colored to be representative of its respective country of origin. I did this to liven up the visual and add some more depth as well. Now this part was straightforward, but I also wanted the reader to be able to visualize 0-60 mph times. I did this by creating another visualization that would visualize the 0-60 mph times by showing a car on the screen going from point A to point B in the actual 0-60 mph time for that specific car. For example, the reader would click on a point in the scatter plot from above, and the car name and its specific 0-60 mph time would show on the bottom visual. The reader would then press start and the car on the screen would begin to move and finish moving in its given 0-60 mph time. This part of the visual was the tricky part, but I was able to get it done and the results were fun! Watching each car go across the screen was very satisfying and people seemed to really enjoy it!

Challenges

Like any other project, there were challenges associated with this project as well. One challenge that I would like to address is the time and effort that it took for data collection. I spent a long time looking at numbers and copying information down from trusted sources to make my dataset. I wanted to add more cars and vehicles to it, but the tradeoff for the time would be too much and outside the time I had for this project. Another challenge I faced was with working with my animated visualization; I had a hard time mapping each point to the correct car and its 0-60 mph time. On the other hand, I grasped a better understanding of plotly and dash which can help me greatly in my future careers and work. One last challenge that I had was that to many, cars are very niche and people do not care for them. So it can be difficult to visualize what the car looks like. If I could go back, I would add another column for URLs of the car's picture and be able to import that in and show the pic when a point was clicked. I think that this would make it much better for readers to understand and visualize each car as well.

Outcomes

Overall, I am more than happy with my work on this project. I learned so much about Tableau and can definitely see myself using this software in the future for other work. As for my dynamic visualization, I am proud of myself for working through my challenges and creating the visualization that I wanted! In the end, it was interesting to see how this part of my life can be seen through visualizations and I would love to build on this or even create more of my own data!