Visualization of Car Features

Amaarah Johnson*

University of Illinois at Urbana-Champaign

Abstract

With recent events around the chip shortage impacting car production many people have turned to used cars. There are many cars with various features that one would consider when purchasing a car. To better evaluate and compare the cars I built a visualization using a car features data set.

Keywords: Cars, MSRP, Transmission.

Index Terms: Visualization

1 Introduction

I developed a visualization using d3, available at https://amaarahj.github.io/. In this visualization we are looking at the car data for 48 makes from years 1994 to 2017. This visualization allows the user to analyze the car data and easily compare important features of the cars. They can focus on the things that are important to them like transmission type, year and make. The data from [1] has car data with features including make, model, year, engine, price and other properties of the car. I used d3 to filter the data and structure it for the charts in the various scenes.

2 Structure

The narrative structure of the visualization is Drill Down. There are eight scenes in the visualization. The scenes each contain annotated charts. After arriving on the first scene and reading the messaging the user has the opportunity to interact and explore before going to the next level. The scenes are ordered in a way that break down the transmission types, then the years, then individual cars. Users can then see how cars compare with respect to city MPG and MSRP.

The visualization allows the user to drill down by clicking the interesting data points or the data point I direct them to using annotations. They can then drill back up to take another directed or undirected path using the navigation bar at the top left. The navigation bar also allows them to see their current location in the visualization. Across the scenes there is a similar layout of chart, navigation bar and dropdown. This ensures the user focuses on the data and can navigate the scenes easily. The titles help the user understand how the data connects to the other scenes. This allows them to understand my message and explore further points of interest in the data. When the user filters the chart with the make dropdown the annotations are removed to allow exploration.

3 Scenes

The first scene in the visualization is a bar chart giving an overview of the cars by showing the count for transmission types, seen in Fig. 1. The count range on the y-axis changes as you explore the makes in the scene. The transmission types on the x-axis remain constant displaying all five options, even when 0. On each bar you can see the exact count value. Hovering indicated that it is clickable to the user. Clicking a bar will take them to another scene.

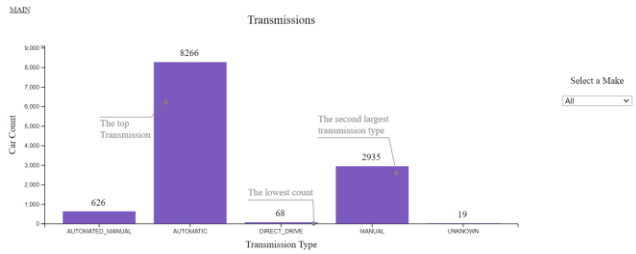

Figure 1: The first scene in the visualization.

The second scene is a bar chart that shows car counts per year for the selected transmission type. In Fig. 2, below you see the count over the years for the Automatic transmission. This chart is different for each transmission type in the first chart. The year axis is constant, and some years have no cars with a certain transmission type. Hovering over a bar gives the exact count for a given year.

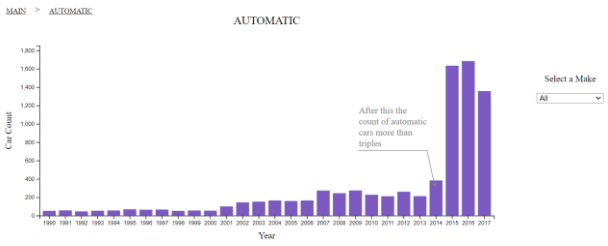

Figure 2: Scene two - automatic transmission.

The last plot is a scatterplot with City MPG vs MSRP for the selected transmission type and year. The points are colored based on car size. The x-axis uses a log scale to distribute the points well as they are largely clustered to the left, lower MSRP, seen in Fig. 3. The y-axis has the city MPG. The points have tooltips with Make, Model, MSRP, and a popularity score.

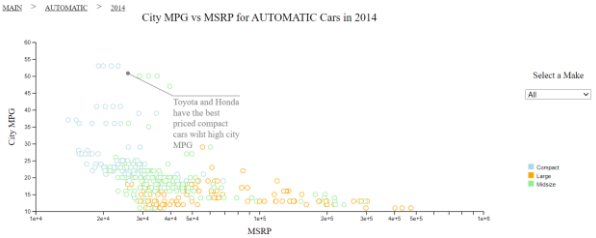

Figure 3: Scene three - automatic transmission in 2014.

The other scenes can be found by following a different annotated path. The user can navigate back using the navigation

* amaarah2@illinois.edu

menu and select a different annotated bar in the chart to see that path.

4 ANNOTATIONS

The annotation style stays the same in each scene. In all charts the annotations are removed when the user is exploring. The annotations highlight parts of the data that support my message. Some paths of exploration won't have annotations. The annotations follow a consistent structure across the scenes of line, label and a dot to indicate the area of interest.

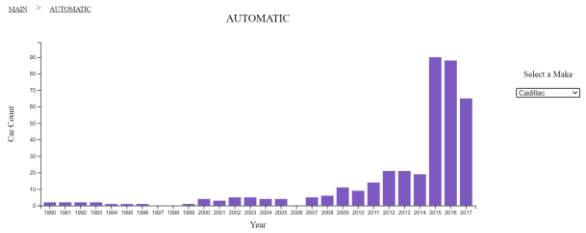

Figure 4: Exploration scene for make Cadillac.

5 PARAMETERS

There are two chart parameters: transmission type and year. Together they determine which of the scenes the user is in. In the first chart the parameters are not set so the user sees all the data. The second chart uses the transmission type parameter to display all the cars for the type selected. The last chart uses the transmission type and year parameters to show all the cars, like in Fig. 3. In each scene there is a make parameter that changes the display to show only one make. The two chart parameters are used to filter the list of available makes, like in Fig. 5. In the third chart the list can contain few make options after all the filtering applied during the drill down process.

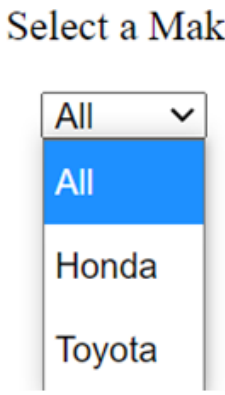

Figure 5: Drop down menu with two options.

6 TRIGGERS

On the scatterplot there are Voronoi points that show the tool tip for the nearest point to the mouse position, this can be seen in Fig. 6. Mouse over events trigger tool tips and highlight the data, in Fig. 6 and Fig. 7.

Figure 6: Voronoi points with tool tip.

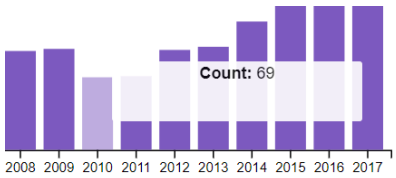

Figure 7: Bar with count shown on hover.

When the user makes a selection from the make menu it triggers the data in the visualization to change. This also triggers disabling the annotations. Clicking a bar in the bar charts or the words in the navigation menu triggers the chart to change.

7 CONCLUSION

The car features shown in this visualization where only a few. Many more things go into the user's purchase decision. Having the ability to visualize and compare more features that the user can control would be a great extension to this visualization.

REFERENCES

[1] https://www.kaggle.com/CooperUnion/cardataset/version/1