Preliminary Analyses and Bonus

Link to the GitHub repository

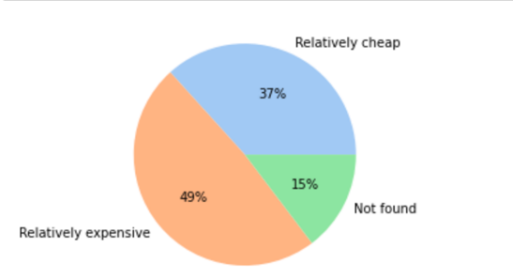
https://github.com/fearofhelicopter/dsci510_project_cars

Analysis and Visualization

The prices of different car models were collected to analyze price changes with inflation from 2021 to 2022. In the analysis, two data samples (2021 and 2022 car prices) were merged using their unique model ids. The growth rate was calculated with the formula R = (last year/ this year) - 1 to get the increase rate of the different models. It can be easily found that the average increase in car prices from 2021 to 2022 reaches 3.13%, and around 80% of models have positive increases, which strongly supports the initial hypothesis that inflation impacts the car market and leads to rising car prices.

In order to deeply analyze the consumption behavior in the car market during the high inflation period, the data set was divided into three clusters: models priced below 40k were named cheap cars, cars priced between 40k and 80k were named median cars, and those priced above 80k were named luxury cars. It can be found that the average increase for both cheap and median car prices stays high at around 3.3%, while for luxury cars is only around 2%. The results make sense because when inflation is high, people are more willing to pay less for a cheaper car. Therefore, the demand for luxury cars does not increase much, and the increasing rate stays relatively low.

[Bonus] Advanced Visualizations



This pie chart is done by comparing invoice prices, which are the prices that dealers get for each model, and the actual prices of the cars. If the invoice price rises less than the actual price, the dealer makes less money selling the car, so the model is relatively cheap for the public. Otherwise, a smaller increase in invoice prices means dealers are making more money selling a relatively expensive model to the public.

It is an important visualization to help consumers make better decisions because if people know whether a dealership is selling a car at a relatively high or low price, they can know which car is fair to buy.

Description of the figures and the findings

- *Car Price Changes from 2021 to 2022* is the figure that shows the price changes of different models. The red line is the 2022 price, and the black line is the 2021 price. It can be found that the red line is mostly above the black line, indicating price increases.
- *Car Price Changes for Different Classes* is the figure that shows the price changes for different categories of models. Compared with affordable and economical cars, the price of luxury cars changes very little.
- *Car Price Increase Rate from 2021 to 2022* is the figure that shows the growth rate of the prices of different models.
- *Car Price Increase Rate for Different Classes* is the figure that shows the growth rate of different categories of car prices.