

Team: Golden Rationalists

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Motivation: We focused on exploring temporal and spatial patterns to look for features that could help in marketing Edmunds.com to different segments of the population. Some of the questions we asked were:

- Do shoppers and buyers of high-end luxury vehicles behave differently from shoppers and buyers of 'economical' vehicles? Does this vary based on new or used vehicles? Does this vary across time and space?
- Are there any state-wise or county-wise differences in customer behavior based on demographic data? How are demographic variables related to customer behavior?

External Data Used:

- To classify vehicles as high-end luxury vehicles, we looked at the descriptions and MSRP of each make through Consumer Reports and Autoblog.
- To examine potential geographical clusters, we merged census data on income rate, illiteracy rate, and population with the internal datasets.
- We pulled FIPS code data to map zip code level data to county level data.
- We also looked at sales tax rates, the cost of owning vehicles, and property tax rates across states.

Investigations:

- We analyzed shopping and transaction trends for shoppers and buyers of luxury cars vs. economical cars by classifying cars as luxury vehicles vs. economical vehicles, graphing trends, and analyzing the differences between trends via longitudinal data analysis.
- We looked at the spatial distribution of the luxury car vs. non-luxury car market.
- We conducted a cluster analysis and principal components analysis of consumers based on census data. We also looked at the spatial distribution of some of these factors.

Results:

- People tended to shop for and purchase vehicles on the weekend. There was some variation between car brands, but this variation was not significant between luxury vs. non-luxury brands. Higher income areas appear to be more likely to purchase luxury vehicles. We have a spatial distribution of the luxury car vs. non-luxury car market.
- Population, income and illiteracy are three factors used in grouping states. We grouped 45 groups with transactions and leads history into three categories based on these three factors: Cluster 1 (e.g., California and Maryland) showed more population and income, Cluster 2 (e.g., Washington) showed higher incomes and literacy rates, and Cluster 3 (e.g., Mississippi) showed lower income and lower literacy levels.

- People in States with higher average income tend to spend more time in viewing contents per section, study more driving test reviews and spend more money in buying cars. Illiteracy level is opposite to income. States with higher illiteracy levels and lower income spend more in car ownership or car maintenance. One possible reason could be that people with low income are likely to buy used cars which cost more in maintenance.

Recommendations:

- Edmunds.com should increase marketing efforts on the weekend.
- Edmunds.com should focus on marketing luxury cars to the areas most likely to purchase luxury cars and mid-range cars to areas more likely to purchase mid-range cars. In this way, for example, Edmunds.com may be more successful in converting economical car buyers in mid-range areas to mid-range vehicles via targeted marketing.
- Edmunds.com can customize their strategy, resource planning and website based on customer engagement behavior. For example, Edmunds.com may provide visitors from high income states with more useful information to read and provide visitors from low income and low illiteracy area with more attractive pictures.

Future Work:

- More demographic features can be extracted and aggregated across dma regions and can be grouped together with respect to similar trends like customer behaviors v/s census data
- More work can be done to examine the differences between the luxury car market vs. non-luxury car market and the factors that influence these markets.