

Group 24

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Milestone 1: An Analysis of Shark Tank; Investment Behaviors

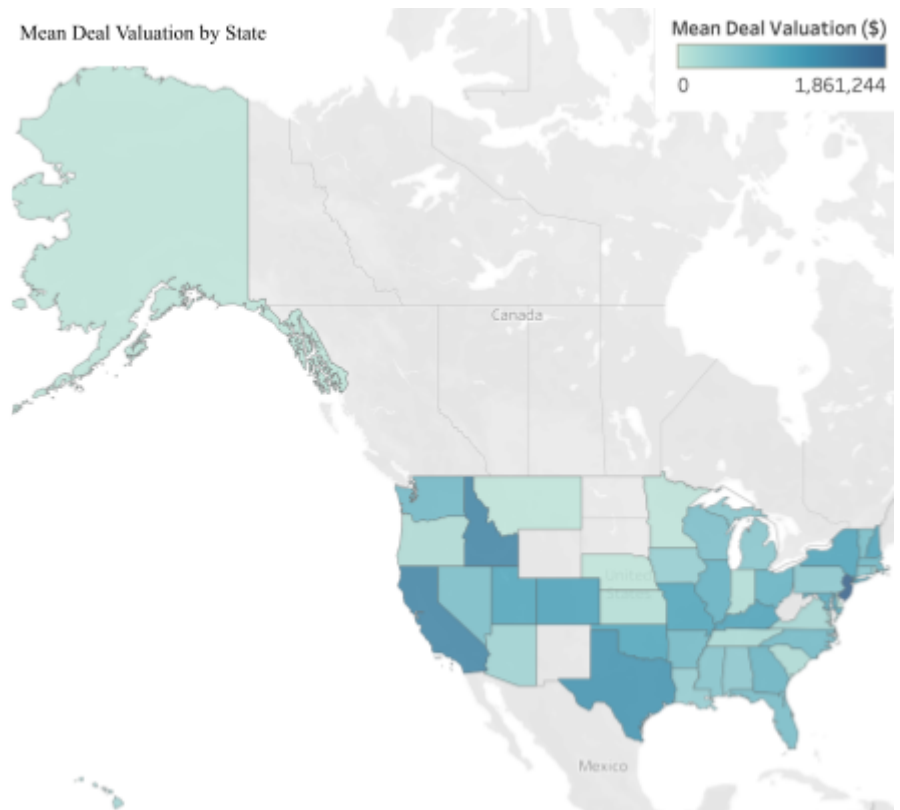
Description of the Dataset

Our dataset was a collection of over one thousand records describing pitches from the show Shark Tank. Shark Tank is a show where upcoming businesses pitch their product ideas to a group of investors, called “sharks.” Investors typically spend some amount of money to purchase a percentage of ownership, called equity, of the business. The deal will give the entire business a value based on the cost of equity. The dataset included demographic information about the teams that pitched products, a categorization of the product’s industry, and the date that the episode aired. This dataset also described how much the pitchers asked for, which sharks were present, and how much each shark decided to invest. With this dataset, we hope to learn information about the investment behavior of individual sharks and investors in general. We hope to use this information to make predictions about the success of individual businesses not present in the dataset.

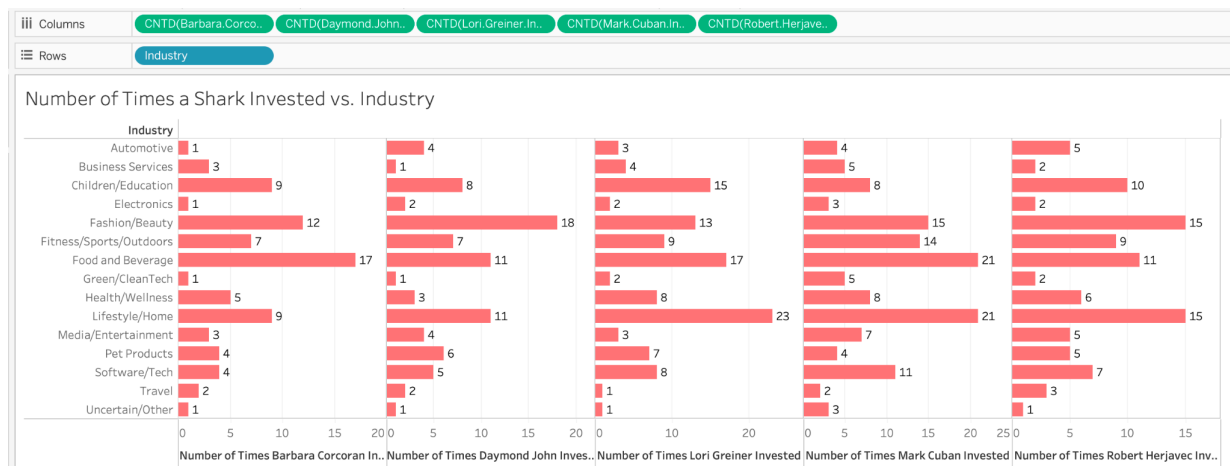
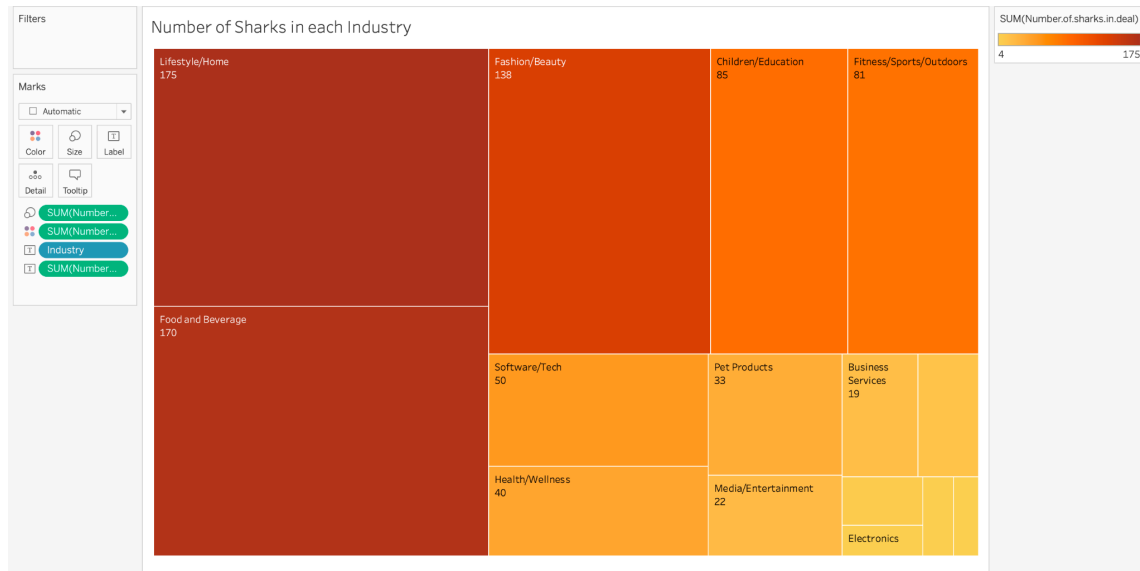
How does deal valuation vary geographically?

For this question, we want to explore how the geographic origin of the pitchers influences the value of the deal made. This will allow us to make predictions about how valuable a business will be based on where it originates.

The map shown represents the mean deal valuation in USD for each state. On average, the states that would traditionally be considered as housing large businesses tend to have the highest average deal value. In particular, the west coast, Texas, New York, and New Jersey are areas with relatively high average deal value. This reflects how these areas have traditionally served as centers for commerce, and are therefore more likely to have highly-valued businesses. From this visualization, we can see that there is likely some correlation between a business’s geographic location and its deal valuation. This provides helpful insight for predicting which businesses will be highly valued.



Which industry are tanks/sharks more willing to invest in?



In the treemap, we mapped out the number of times the sharks invested in each industry, and it is easy to see that the majority of the sharks were interested in the Lifestyle/Home industry. The Food and Beverage industry was the second most invested industry with a difference of 5 in the number of sharks that invested in that industry. Another industry that had a majority of the investments was Fashion/Beauty with 138 times the sharks were involved in the deal. Thus, most sharks were inclined to invest in the Lifestyle/Home industry or the Food/Beverage industry.

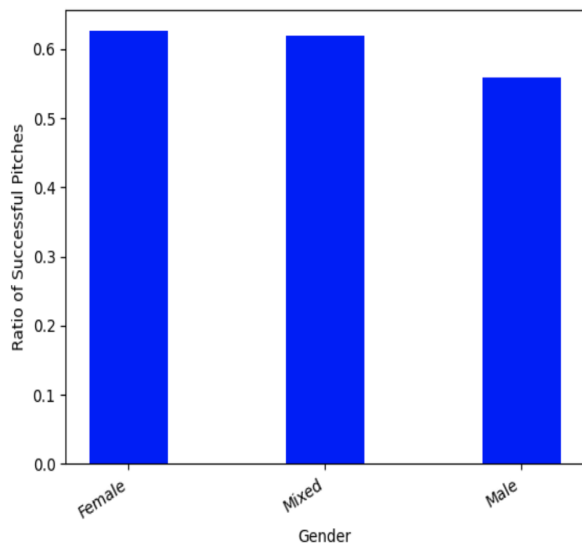
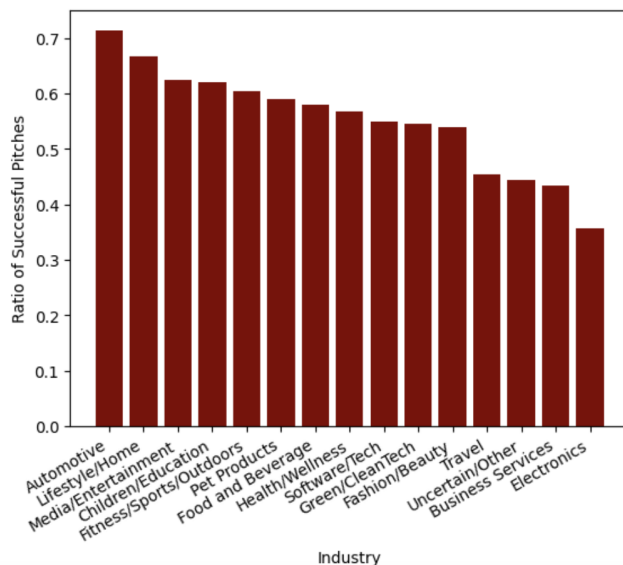
In the bar graph, we elaborate on the treemap by breaking down the number of times each shark invested in each industry. For Barbara, she is most interested in deals involving the food and beverage industry with 17 investments. Both Daymond and Robert invested the most in the fashion/beauty industry, while Robert also invested the most in the Lifestyle/Home industry. This is similar to Lori's investments as she invested the most in the Lifestyle/Home industry as well. Finally Mark tried investing the most in both the Food/Beverage, like Barbara, and the Lifestyle/Home industry, like Robert and Lori.

How does investment behavior vary by industry and gender?

Investment behavior can be influenced by a variety of factors, including industry and gender. The focus of the analysis goes beyond just looking at the total number of investments. The next step is to understand the ratio of successful pitches that result in investments for each industry. This ratio is useful because it allows for better comparisons between data sets of different sizes.

The analysis of the ratio of successful pitches across different industries reveals that there are significant differences in investment behavior across various sectors. Automotive, Lifestyle/Home, and Media/Entertainment are the top three industries in terms of ratio of successful pitches.

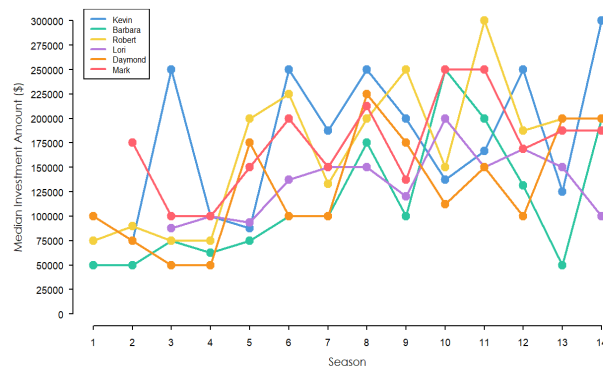
For instance, consider two industries: Lifestyle/Home and Automotive. Suppose that sharks invest 17 times in Automotive and 175 times in Lifestyle/Home. Simply comparing these numbers may lead us to conclude that sharks are more interested in Lifestyle/Home. However, this conclusion may be flawed when we see Automotive has a much higher success rate in pitches than Lifestyle/Home industry.



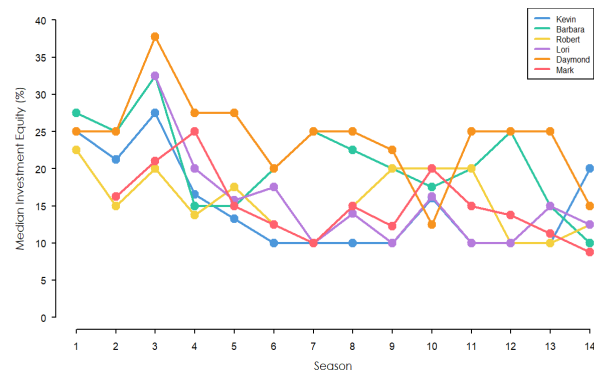
Gender can also play a role in investment behavior. The analysis indicates that female-led pitches have the highest success rate, followed by mixed-gender pitches, and then male-led pitches. However, the difference between the success rates of each gender is relatively small, suggesting that gender may not have a significant impact on investment behavior. Further research could provide more insights into how gender influences investment behavior in different industries.

How does investment behavior vary by shark?

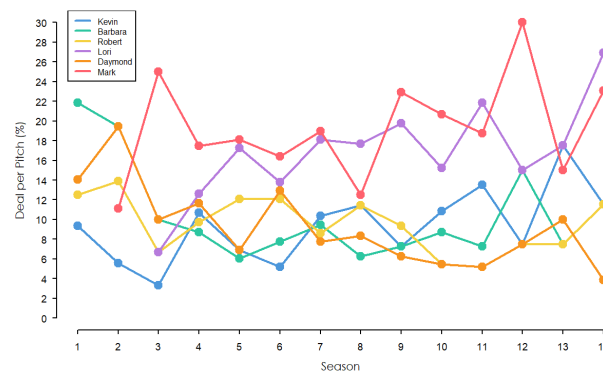
Median investment amount by shark



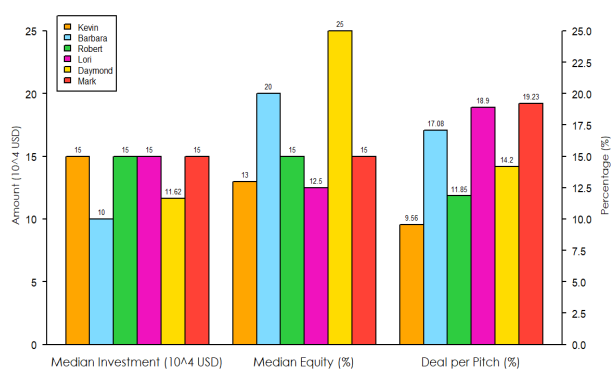
Median investment equity by shark



Deal ratio by shark



Overall investment amount, equity, deal ratio



Analyzing investment amounts, equity, and deal ratios helps us understand the investment behavior of each shark in Shark Tank. This knowledge provides valuable insights for refining our machine learning model to make better predictions of investment decisions by the sharks. The set of visualizations above reveals that, over the 14 seasons, the sharks invested increasingly higher dollar amounts while their equity stakes slightly decreased. However, the percentage of successful pitches has remained relatively consistent.

Barbara Corcoran tends to invest more in smaller businesses with low investment amounts, but her investment equity is relatively high. Daymond John invests similarly to Corcoran but to a greater extent, with an extremely high tendency to invest in businesses that are willing to give up a large percentage of their equity. Kevin O'Leary invests mostly in high-value businesses, but is very selective in his decisions. Robert Herjavec is also cautious in his investment decisions but tends to invest in a few seasons. Lori Greiner invests small amounts of money but is one of the most willing sharks to make a deal with entrepreneurs. Mark Cuban has the highest net worth, invests in companies with high valuations, and tends to invest relatively higher in dollar amount, but lower in percent equity.