11/26/2024
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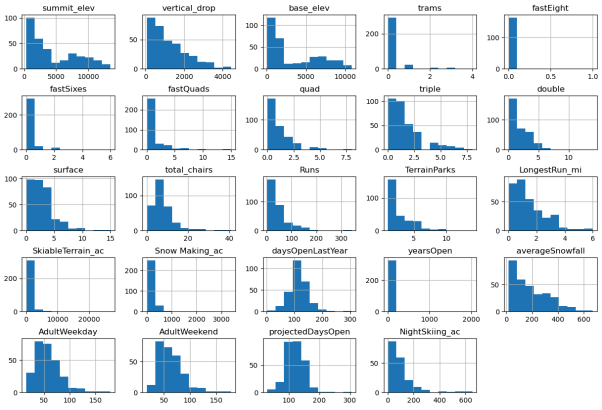
Optimizing Pricing Strategy with Statistical Modeling– Big Mountain Ski Resort

Big Mountain Resort decided to take a proactive approach to ensuring their success in the upcoming ski year. Leadership had a suspicion that they may not be maximizing their potential bottom line. They wanted to explore whether they may have been under pricing their tickets and/or lacking efficiency in their operational spending. I was given the honor of helping Big Mountain Resort look for answers and build a data-driven strategy to move forward. I will summarize my findings below.

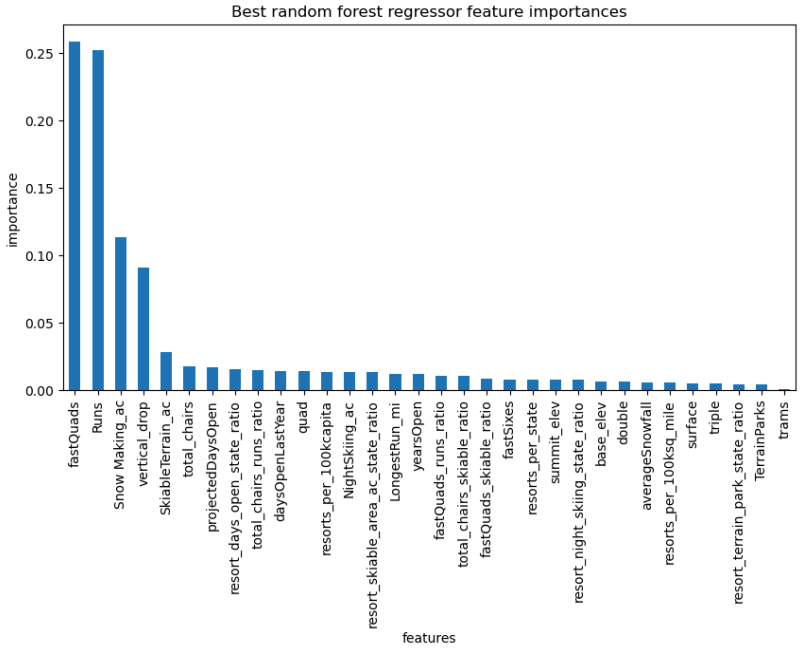
For context, prior to investigating what opportunities exist for maximizing their pricing and operational spending, Big Mountain Resort had just made upgrades to their facilities which included installing a chair lift that added $1,540,000 to their operating costs for the upcoming year. Beyond reducing expenses, they recognize that they don't understand what factors customers really value in order to raise the price of their tickets. They want to take a data-driven approach to their strategy for the upcoming year.

After defining the problem, I took a set of raw data and cleaned it up. This step of data wrangling included arranging the data in a way that it was easy to look at, cleaning up missing columns, and setting it up to analyze. After that, I was able to jump into Exploratory Data Analysis where I determined features are worth looking at. Image to the right shows how I was able to visualize relevant clusters vs sparse outliers on the features. I found it made sense to exclude Weekday and just look at Weekend prices, as well as found the features that affect ticket value are reliable snow terrain, night skiing, terrain parks and days open.



Next was running some models against the data. I first ensured all my data was numerical, then I was able to use statistical tests against my model. I tested the model both against the mean and median and found the median to be a more accurate predictor, as the mean had a $19 variance from the ticket price and median was closer

with a $9 variance. I replaced all missing values with the median, then created a linear model by creating a pipeline, but this made the variance worse. After trying a forest regression, I stuck with this model as it showed less variability. See below image for random forest regressor results. I was happy to see that the top 4 features of importance that came up are in line with my earlier test, reinforcing what to focus on.



My modeling suggests that Big Mountain Resort's features support raising the ticket price from $81 to $95.87. When presenting these findings to business leadership, I would be mindful of the fact that Big Mountain is already sitting at the top edge of pricing in Montana. I would highlight how I found that the various facilities contribute to either raising or driving down the perceived value people will pay for and show them evidence for why I'm recommending the higher price. I would also paint a picture for them of how the additional revenue would offset their new chair lift. With 350,000 expected guests and average of 5 days skiing per guest, the additional $14.87 ticket price would generate $26,022,500 more over the course of this upcoming ski year, vastly more than the $1,540,000 chair lift operating costs.

For future work, the scenario I would recommend is increasing the longest run by .2mi and guaranteeing snow coverage by adding 4 acres of snow making capabilities because these features have no expected increase in operating costs, but increase customer perception of value. Another area I'd recommend being focused on is pulling up the entire operating budget so it could be analyzed to find more areas of opportunity

in the expenditures beyond the new chair lift they installed. It would be great to take a more comprehensive look at what may be possible.