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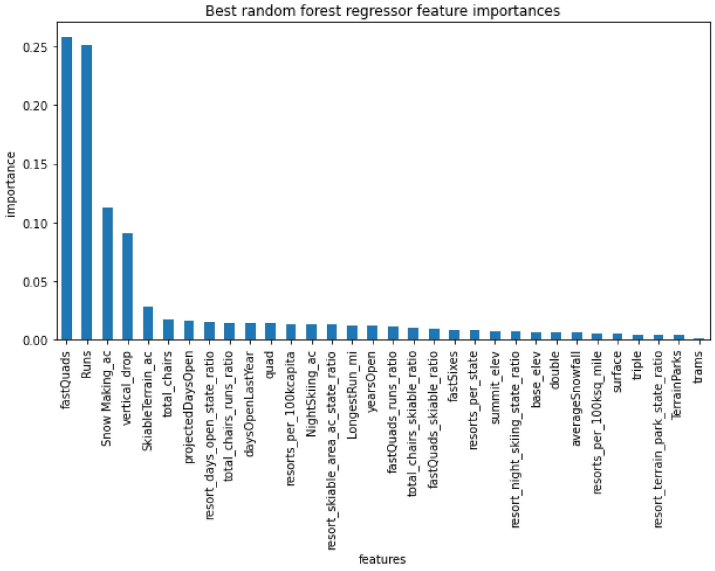
Big Mountain Skiing Ticket Pricing Analysis

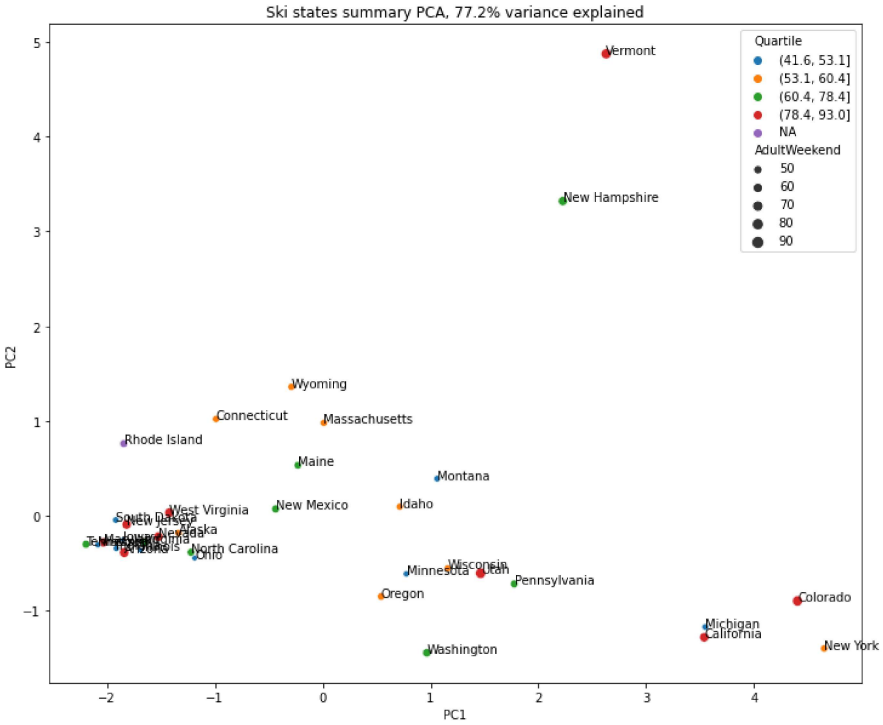
Our client Big Mountain Skiing Resort has had some concerns that it hasn't optimized its ticket pricing strategy. They've also wondered about the potential for rolling back certain extant but underutilized assets that might allow them to maximize their revenue stream. We've taken a closer look at the dataset provided by Alesha Eisen containing pricing/resort info for resorts in our client's market segment. Our main findings are that a pretty substantial increase in Big Mountain's ticket pricing from the current $81 up to the range $95 +- $10 is supported by the market. These estimates are based off of Big Mountain's current offerings (i.e., the number of runs, chair lifts, etc.) when seen in light of how these various offerings / resort assets correlate with pricing throughout the entire market segment. Based on this analysis we would also recommend progressively shutting down up to 4-5 of the most underutilized / least popular runs on the resort.

We employed a regression model for predicting the adult ticket prices based on the features. For this we employed a random forest regressor which we found had the best statistical performance (best MAE and estimator variance based off of a 5-fold cross validation). Some important take-aways were that the total number of runs, the area of the resort where snow is made, the vertical drop (max base-to-summit height differential in the resort), and the number of fast quads were by far the most dominant factors correlating with the prices that resorts charged for tickets:



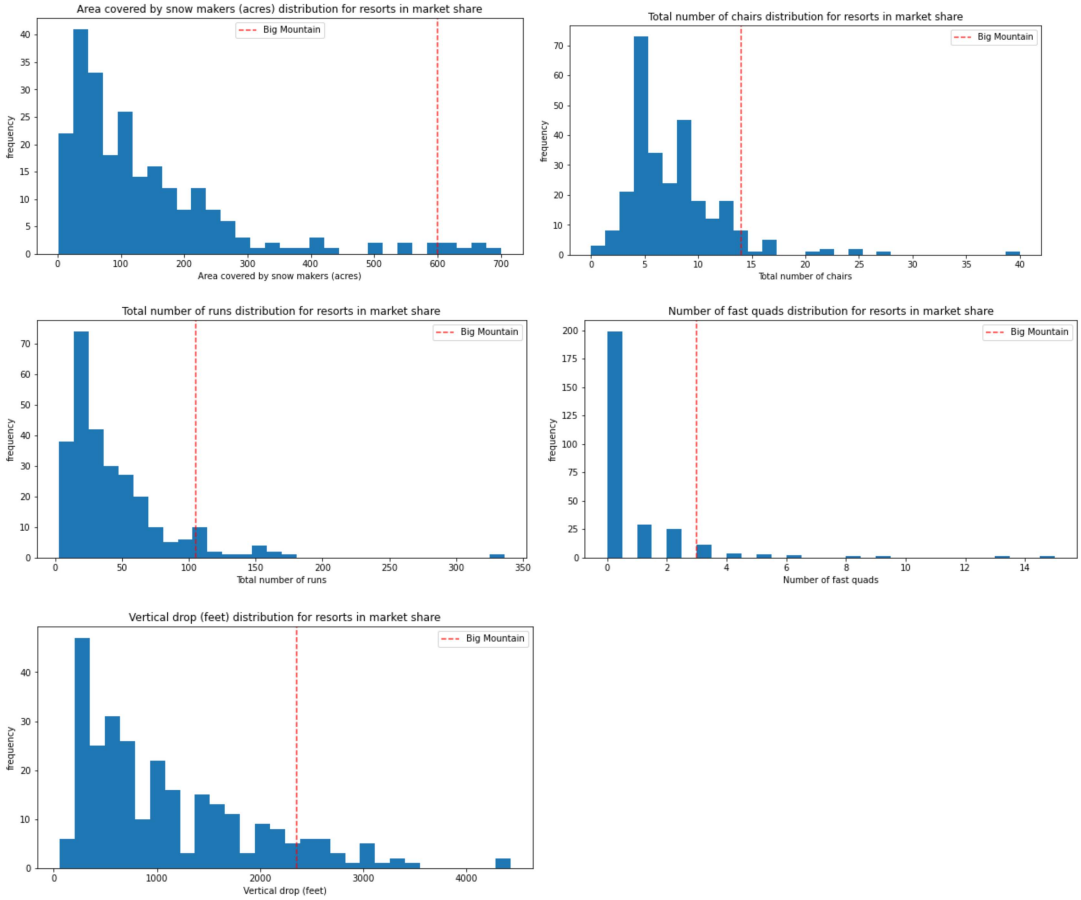
These same features ended up also being dominant in other regression techniques employed (least squares linear, etc.) implying that the importance of these offerings in effecting what resorts can charge is fairly robust. All of these features are positively correlated with the price charged (more runs is correlated with higher ticket prices, etc).

The regression was performed across the entire market segment. We did not see any particularly obvious grouping of ticket pricing by state with marker size indicating pricing and color indicating quartile range of ticket prices for a particular state. PC2 roughly represents the influence of the number of resorts per capita and PC1 represents the influence of a state's skiiable area, night skiable area, and the state's total days open per season for skiing.



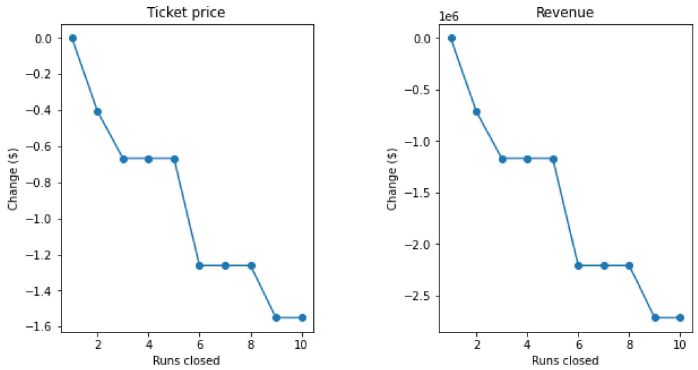
Montana, where Big Mountain skiing resides, is certainly within the lowest quartile in ticket pricing across states. But the lack of a pattern in the price grouping by state in the relevant factors influencing by state pricing suggests that there is no particular reason to condition our analysis of how ticket pricing correlates with assets on any particular grouping by state.

The suggested ticket price range for Big Mountain at $95 +- $10 is considerably higher than the current price at $81. And while $81 is most certainly the highest ticket price in Montana, comparing ticket pricing vs the relevant resort assets we identified across the entire national market, suggests that the suggested price range should be supported by the market. Big Mountain consistently stands at the top of the national distribution for the various assets that we identified as most significantly directly correlated with the price (total number of runs, the area of the resort where snow is made, the vertical drop, number of fast quads).



Based off of this and our regression model on the entire national dataset, we do not find the recommended ticket price range unreasonable.

We've also analyzed the ticket price / projected revenue reduction vs the number of runs that Big Mountain closes using our regression model. The ticket revenue estimates assume 350K visitors to the resort buying an average of five tickets each per season.



At Big Mountain's operating point with 105 total runs, it seems clear that closing one run that is not generating enough usage does not change the ticket pricing that the model suggests. So it would be worth doing although we would need additional data to estimate how much that would save in revenue. Closure of additional runs might also be good. If we decrease the number of runs by 3 then the model would suggest a price decrease of 70 cents (<1 dollar). Furthermore, the data suggests that closing down an additional 2 more runs (so 5 runs closed) would still keep the ticket price reduction at 70 cents. This is far less than the ticket pricing increases (of ~ 10 dollars over Big Mountain's current price of 81 dollars) suggested by the model -- even at the most conservative suggested price increase of ~ 4 dollars / ticket (estimated by operating at 1 sigma below the suggested average price to be at an operating point of $85.4)

Finally we've taken a look at a whole host of possible strategies for increasing revenue. One potential avenue that our model suggests to look into: creating an additional run with a ski lift that increases the resort's max vertical drop of ~ 150 ft. People are clearly attracted to ski runs with higher vertical drops and that is something Big Mountain could improve on. Our projections show that this move would likely support a ticket price increase of ~ 2 dollars. Assuming 350K visitors, each buying 5 tickets a season, this would suggest a revenue increase of 3.46 million dollars/season. Again, additional data on chair lift/run maintenance costs would be fairly helpful here.