Maximize Big Mountain Resort's Return by Predicting Ticket Pricing

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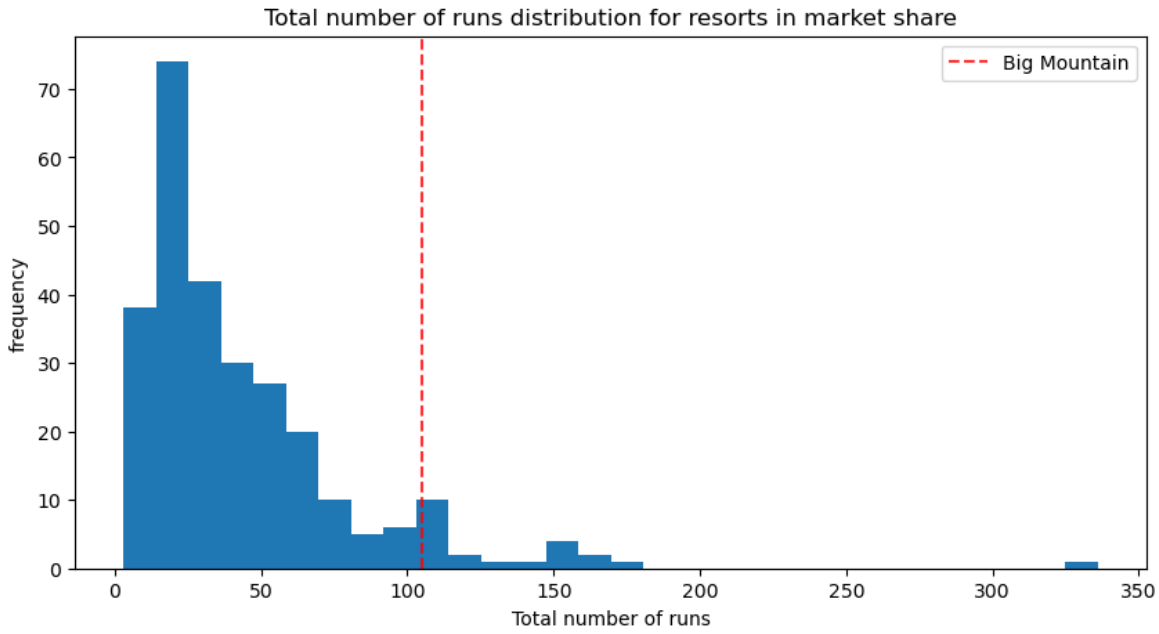
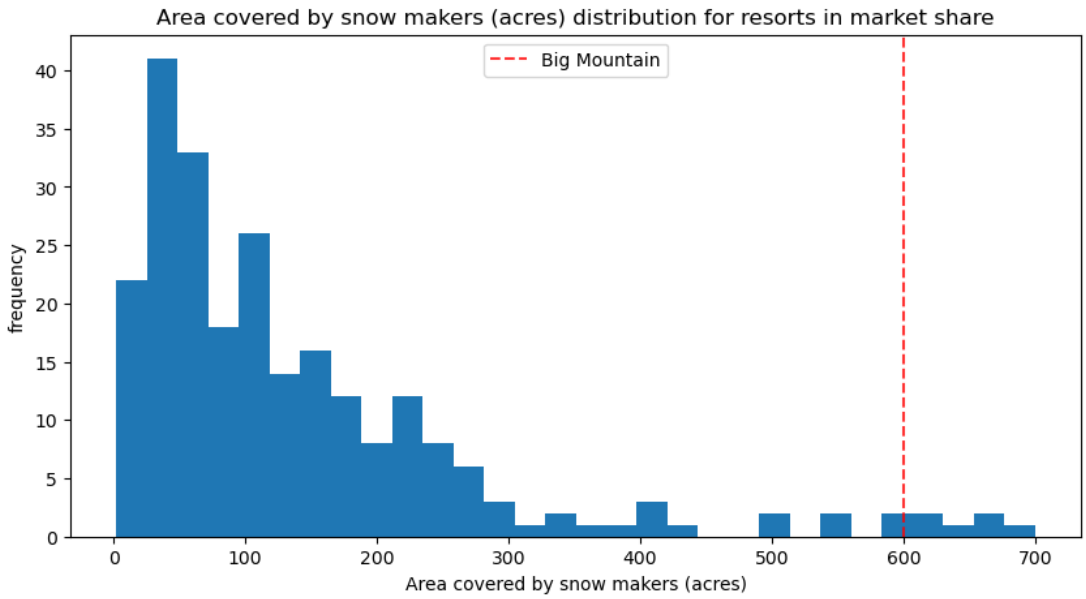
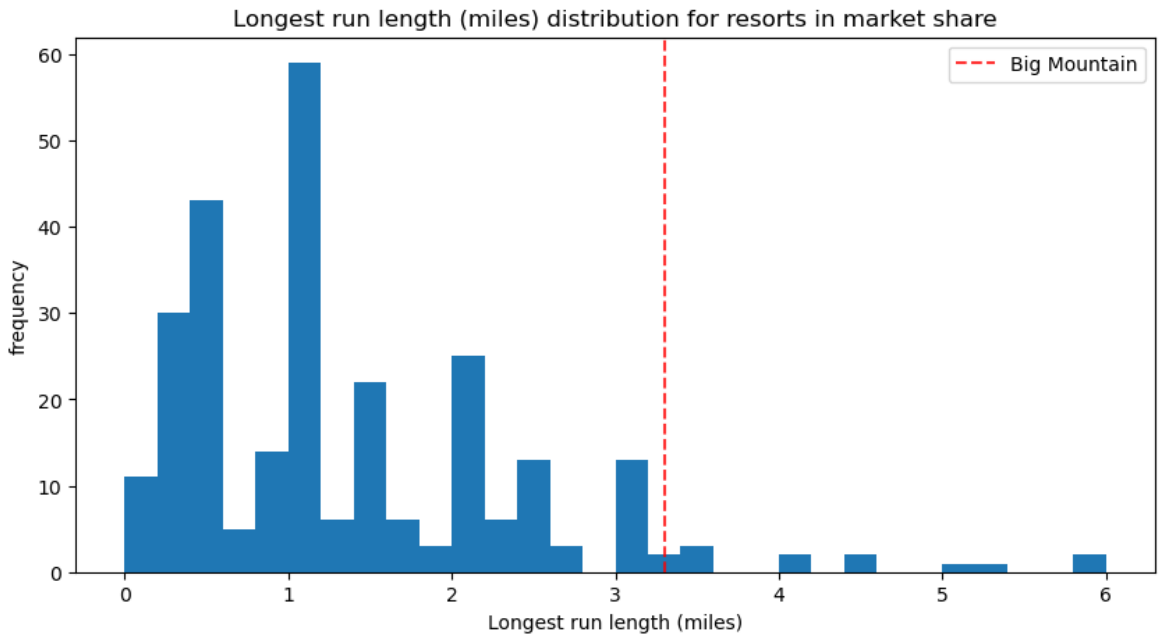
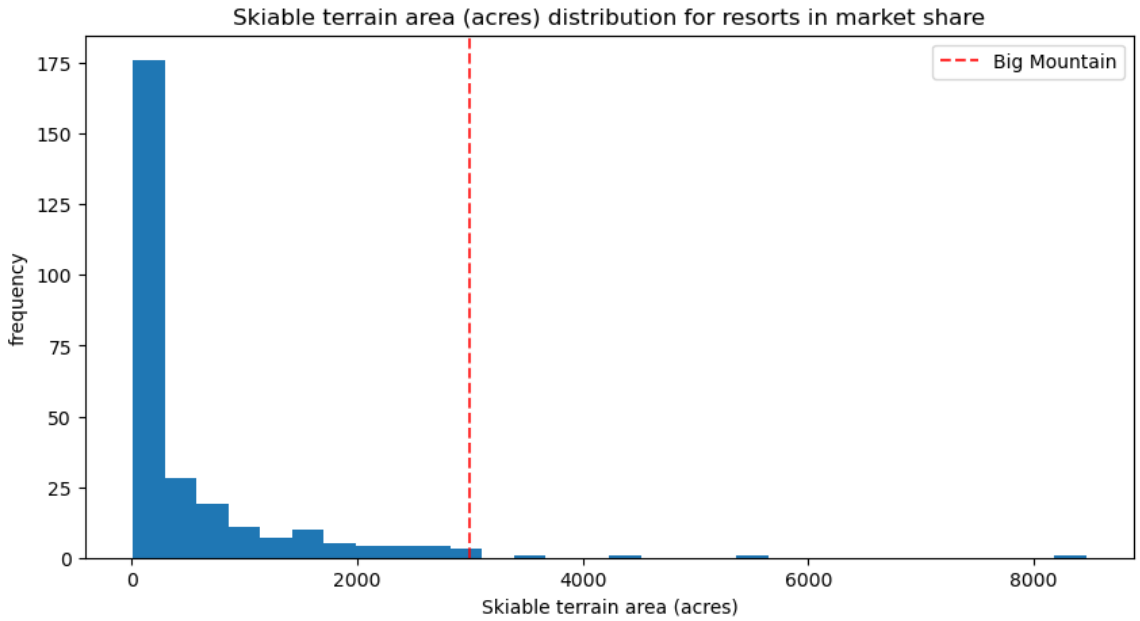
Big Mountain Resort is a popular ski resort located in Whitefish, Montana. The resort offers amazing views as well as numerous types of ski runs and services. After installing a new chair lift Big Mountain Resort's operating costs had a rather large increase which caused the business to rethink their pricing strategy. It is suspected that they may not be maximizing their returns based on their current position in the market, which is a big problem. The resort is in need of a new pricing strategy that is instead based on data gathered from many other ski resorts across the country.



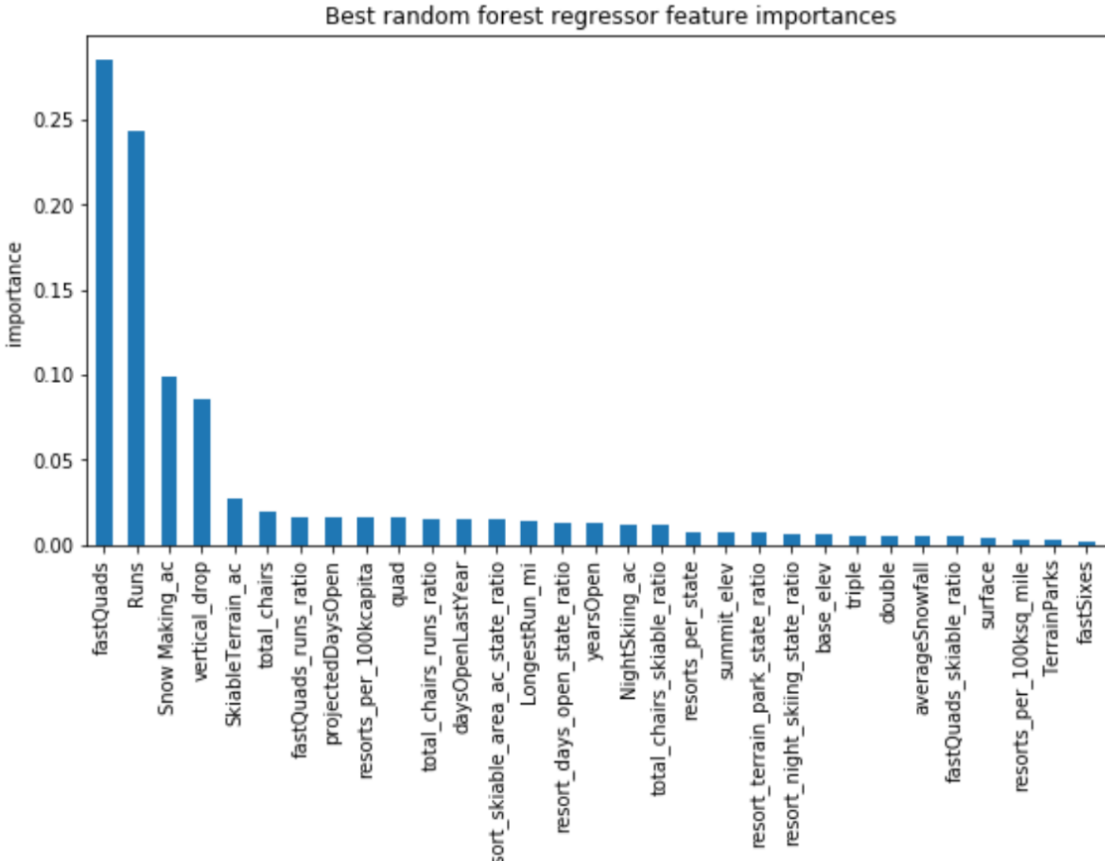

Area covered by snow makers (acres) distribution for resorts in market share
Big Mountain
frequency
0
5
10
15
20
25
30
35
40
0
100
200
300
400
500
600
700
Area covered by snow makers (acres)



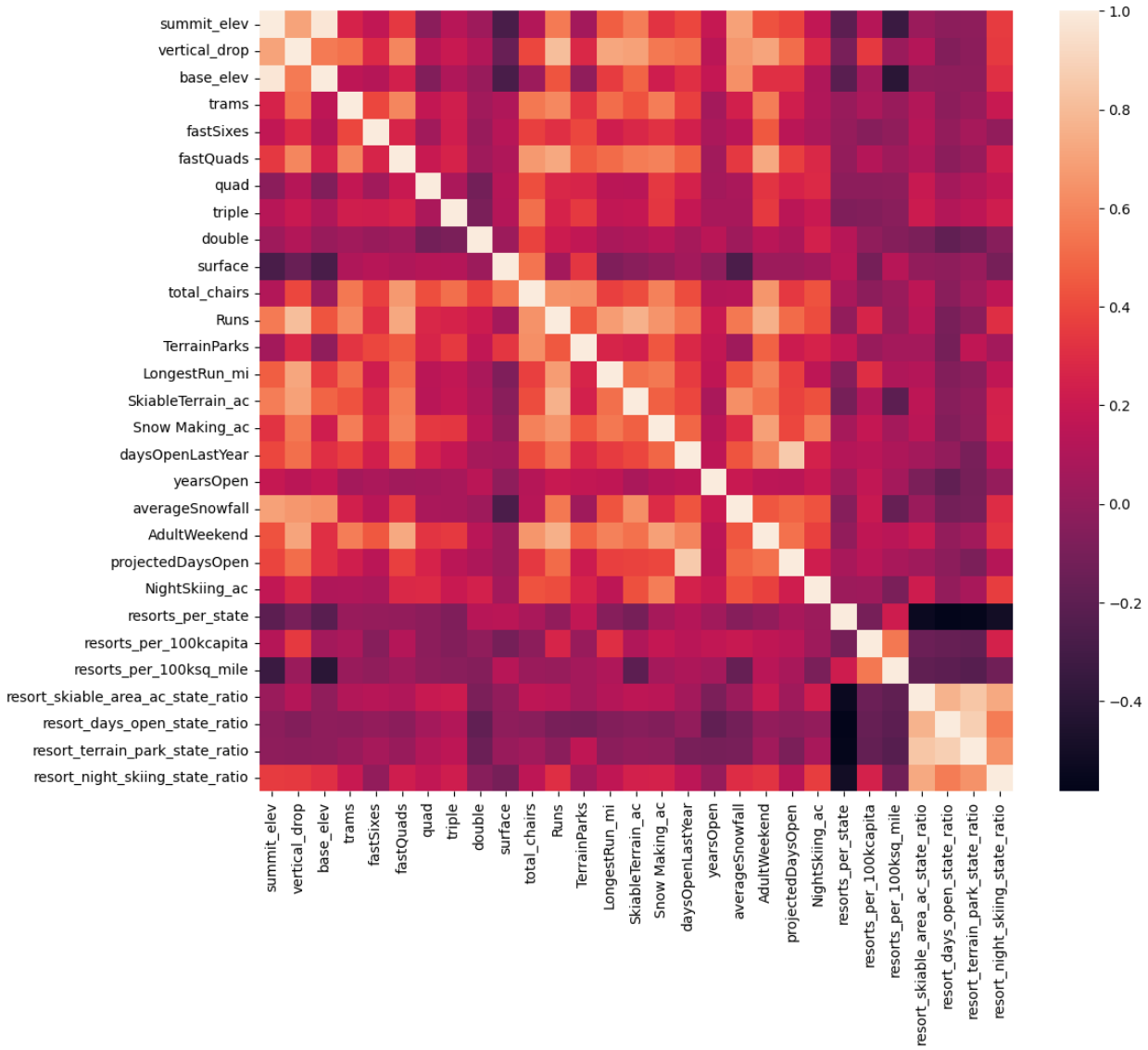


By developing a strong sense of what facilities matter most to visitors, this will help to determine what guests are most likely to pay more for. Building a predictive pricing model using ski resort tickets in our market segment will aid in coming up with recommendations for the resort. This model will be used to provide guidance for Big Mountain's pricing and future facility investment

plans. Using our model, Big Mountain Resort can gain a better insight into what an ideal ticket price could/should be, and how that might change under various scenarios.



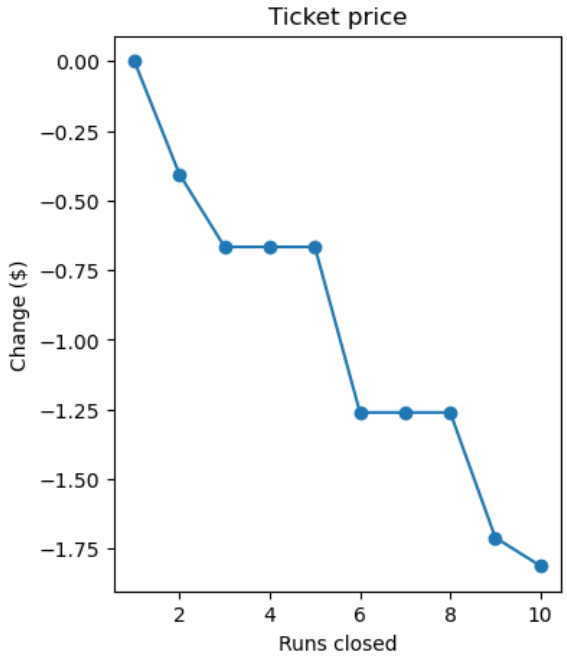
Two data sets, ski_data and state_summary, were used to help create my model. To visually represent the pattern of a relationship between the states and the target feature which is ticket prices, Seaborn was chosen as opposed to Matplotlib as it produces a better output. It was determined that of the ski summaries for each state, which accounts for some 77% of the variance, there is simply no obvious pattern with ticket pricing. To gain a high level view of the relationships amongst the chosen features a heatmap was used. As seen in the heatmap Fast Quads, Runs, Snow Making and Night Skiing have a strong correlation with ticket pricing. The Vertical Drop seems to also be a selling point that raises ticket pricing.

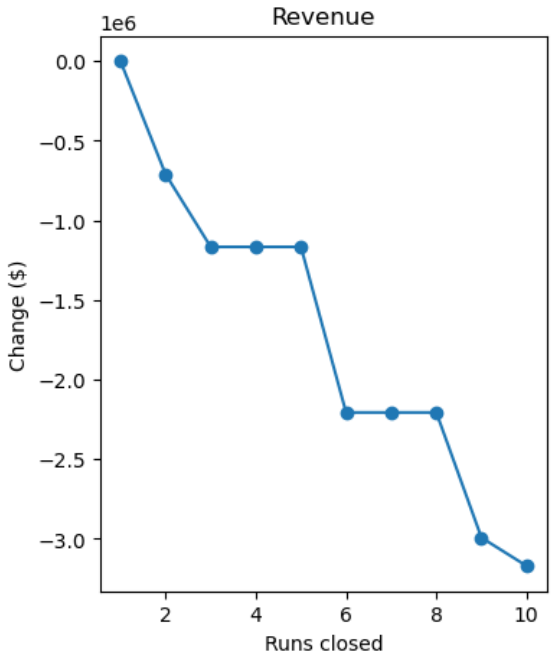


Rather than taking a general guess, a Linear Regression Model and a Random Forest Model was created to determine with confidence a superior average price. The Random Forest Model was chosen due to its lower cross-validation mean absolute error by almost $1. It also exhibits less variability than the Linear Regression model. Using the Random Forest Model, some insight was gained in regard to what Big Mountain's ideal ticket price could/should be, and how that might change under various scenarios. Being able to sense how facilities support a given ticket price is valuable business intelligence. This is where the utility of our model comes in.

Big Mountain Resort has recommended some potential scenarios of their own for either cutting costs or increasing revenue from ticket prices. Although multiple options were suggested not all options were deemed to be profitable. A scenario that would be considered to have a profit would be if Big Mountain closed down up to 4 or 5 runs as there's no further loss in ticket price. However, increasing the closures to 6 or more runs would lead to a rather large drop. Another scenario that guarantees prophet would be Big Mountain increasing the vertical drop of a run by 150 feet and installing an additional chair lift. That adjustment alone would support an increase in ticket pricing by $1.99. Over the season, it would be expected to amount to around $3,474,638.

A scenario suggested by Big Mountain Resort that would not turn a profit would be adding 2 more acres of snow making cover. Such as small increase in the snow making area would really make no difference. As well as, increasing the longest run by 0.2 mile to boast 3.5 miles length which would require an additional snow making coverage of 4 acres. The Longest Run is all the way down the feature importance list as per the Random Forest Model, which was chosen because of its better performance as opposed to the Linear Regression model. Based on the chosen model, neither of the changes suggested would have any affect to their revenue.





The data supports the theory that compared to the competition, Big Mountain is charging very little for their facilities and would benefit from a few alterations. It is also quite apparent that their facilities are on the higher end, as opposed to the competing resort's facilities. As per my models current prediction, at least a $10 increase in ticket pricing is recommended. Raising the ticket price from $81.00 to $96.62 would be a great reflection of what Big Mountain Resort has to offer to their customers. Based on all that has been covered, there are two very simple ways to cut costs and boost revenue while still providing all the amenities they have to offer their customers. There could always be more information gathered to draw even more conclusions on ways to make additional improvements to boost revenue for the resort. It is clear there are many opportunities for growth at Big Mountain Resort and I look forward to seeing the results of this analysis being implemented into the business.