

Big Mountain Resort Project Report

Big Mountain Resort wants to closely examine the amenities provided at the resort as a comparison to their ticket prices to develop an optimal pricing model. The current pricing model is to charge a premium above the average price of the resorts in its market segment, however, a closer examination of the data around the pricing model for Big Mountain Resort shows that the price per ticket could be raised to \$85 per adult ticket on the low end and \$100 per ticket on the high end to better reflect the facilities and the pricing models of its competitors.

In the initial data wrangling, the team used 26 data points for each of the resorts in our market segment. Early in the process, we realized that we needed to focus on data on the weekend ticket prices for our target segment as this was the pricing data we had for more of our resorts than the Weekday Ticket prices. At this point, we removed any resorts that did not have weekend pricing data from our data set so we could focus our energy on looking at the 277 resorts where this information was available. We also added in state demographic information so we could examine any states where there were a disproportionate number of resorts to make sure we weren't basing our analysis on states that were not similar to Montana in some way.

Once we had cleaned this data, we were able to study the data and look for which elements of the resorts had the highest correlation to ticket pricing. By doing this, we got a glimpse into what the skiing consumers were interested in with regard to amenities provided by the resorts. The heat map that we created showed heavy correlation in six types of resort amenities:

- Fast Quads
- Runs
- Snow Making Acres
- Night Skiing Ratio
- Total Chairs
- Vertical Drop

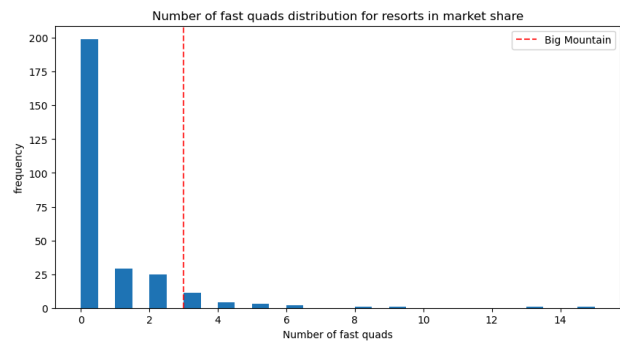
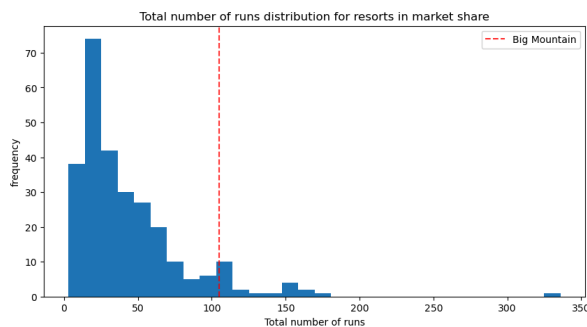
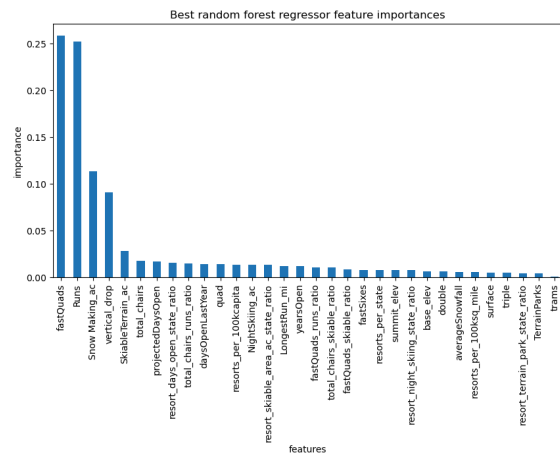
These amenities showed that skiers are most interested in not only the number of runs and chairs, but the ability to ski as much as possible (Fast Quads) and like knowing that there will be guaranteed opportunities to ski (Snow Making Acres and Night Skiing Ratio). There is also a want for quality of skiing as shown in Vertical Drop. Knowing these elements were highly correlated with ticket price showed us what to focus on to develop a ticket pricing model.

After the initial dive into the data, we studied the missing data in our set. We tested using the mean or median to fill in for the missing data points, landing on the median as the data point that most closely reflected the data and limited our error. Given this information, we create models using the mean, several types of regression and random forests to test for the most effective way to model our ticket prices for Big Mountain Resort.

After studying several algorithms with regard to ticket price, we had two models that outperformed the rest: A linear regression and a random forest generator. We used 70% of our data set to train a model and the remaining 30% to test the two models. In studying the two models The Random Forest regressor was

our most consistent model with almost \$1 in ticket price less in variance than the linear regression model when looking at the mean average error for the two models.

In using this model, the team saw that Fast Quads and Runs were the two most important features to the model (as shown in the chart to the right). In looking at where Big Mountain ranks in both runs and fast quads (the red dashed line on the two charts below), the resort is amongst the leaders in both runs and Fast Quads. The data shows that a majority of resorts do not have Fast Quads, which is a significant advantage for Big Mountain in the market.



Looking at this data, the model shows that Big Mountain should be pricing tickets at \$95.87, with an error of \$10.39. So, at minimum, Big Mountain should increase prices to at least \$85, which would offset the cost of the new lift as the new lift cost would be offset by an increase of \$0.88 per ticket. All price increases beyond that amount would add additional revenue.

While studying our data, there were two scenarios presented by the board that warrant future analysis. The addition of another run that would increase vertical drop by 150 feet and the number of total runs and chairs by one each would warrant a ticket price increase of \$8.60. This addition would be a strong revenue addition to Big Mountain. The scenario with closing up to 10 runs needs to be studied in greater detail. One run closure would not affect projected ticket prices, but 2 runs would show a drop in ticket prices and anything beyond five runs dropped shows a large drop off in the daily ticket price. Any run closures would need to be analyzed via run usage data and survey data of our customers about their usage of runs.