Big Mountain Resort is a ski resort located in Montana. It offers spectacular views of Glacier National Park and Flathead National Forest, with access to 105 trails. Every year about 350,000 people ski or snowboard at Big Mountain. This mountain can accommodate skiers and riders of all levels and abilities. These are serviced by 11 lifts, 2 T-bars, and 1 magic carpet for novice skiers. The longest run is named Hellfire and is 3.3 miles in length. The base elevation is 4,464 ft, and the summit is 6,817 ft with a vertical drop of 2,353 ft. They have recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increases their operating costs by $1,540,000 this season. Their premium is charged above the average price of resorts in its market segment. The resort wants to have a better business strategy to maintain profit margin at 9.2%.

In this project, there are two main datasets of the skiing resorts and fifty-state geographic information used for analysis, such as the state's population, total area, number of resorts, skiable area, night skiing area, total open days, resort density at each state, etc.

Looking at the top five in general, the area of skiing available at night are more northerly states. The total days open seem to bear some resemblance to the number of resorts in Colorado. There are states that host many resorts, but other states host a larger total skiing area. The states with the most total days skiing per season are not necessarily those with the most resorts. New York State boasts an especially large night skiing area. New York had the most resorts but wasn't in the top five largest states. New York has the second largest population behind California. It shows an interesting view of normalizing the number of resorts per 100k squared miles and 100k population at each state. Vermont seems particularly high in terms of resorts per capita, and both New Hampshire and Vermont top the chart for resorts per area. Visitors would seem to value more guaranteed snow, which would cost in terms of snow making equipment, which would drive prices and costs up. It seems a greater share of night skiing capacity is positive for the price a resort can charge. As well as runs, total number of chairs is quite well correlated with ticket price. People seem to put more value in guaranteed snow cover rather than more variable terrain area. The more chairs resort has to move people around, relative to the number of runs, ticket price rapidly plummets and stays low. These modeling results suggest that vertical drop is the biggest positive feature, followed by snow making equipment. On the other hand, the skiable terrain area is negatively associated with ticket price. Additionally, the random forest model works very well in a lot of cases.

In conclusion, the Big Mountain Resort is currently charging $81 per adult, which might be undercharging. I looked the pricing and other data from other skiing resort, and some open-resource dataset relative to the Big Mountain Resort. Based on the result of modeling, the idea price is $95.86 which is almost $15 higher than the current ticket price. As the calculation result, it cannot conclude that it is undercharged or overcharged.

Based on the provided data, the current price of the Big Mountain Resort is higher than many resort around the U.S., and the highest one in Montana for a good reason. It may be because their vertical drop, snow making area, total number of chairs, fast quads, runs, longest run, tram, skiable terrain area are higher than the most other resorts too.

Chart, histogram

Description automatically generated

I also looked at some modeling scenarios, it says closing one run makes no difference. Closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes 3 runs, it seems they may as well close down 4 or 5 as there's no further loss in ticket price. Increasing the closures down to 6 or more leads to a large drop.

Chart, line chart

Description automatically generated

If the resort increases the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage, it will increase support for ticket price by $8.61, and by over the season, this could be expected to amount to $15065471. I tried to add 2 acres of snow making in the previous scenario, it would increase support for ticket price by $9.90, and by over the season, this could be expected to amount to $17322717. I also tried to increase the longest run by 0.2 miles and guaranteeing its snow coverage by adding 4 acres of snow making capability, and it made no difference. The resort could try the case of closing runs based on popular usage or close the runs one at a time to determine if it makes a decrease in sale. In this project, the only price data in the dataset were ticket prices, along with some information about the additional operating cost of the new chair lift, I think other prices that would need to be applied to increase the accuracy of the model, including the cost to operate new chairlift, increase skiable acreage, add more snow making capacity, create or extend trails. The fact that the facility rated high on most of the data points are the reason that the modeled price was much higher than the current price. It would be useful if I can put the model on some visualization applications with some features that allow the resort planning managers to test a new combination of parameters in a scenario.