

Big Mountain Resort, a Montana ski resort, accommodates about 350,000 skiers and snowboarders every year. A new chair lift was recently installed and increased the operating costs for the resort by \$1,540,000 this season. The new lift was added to accommodate a more even distribution of visitors across the mountain in order to keep up with competitors. However, the resort's pricing strategy is to charge a premium above the average price of resorts in the same market, which imposes limitations. Big Mountain needs to have a better understanding of what will impact ticket price by examining facilities that are offered, rather than looking at external pricing and basing decisions off their choices. By doing this, Big Mountain can consider bigger changes such as cutting costs or supporting decisions to raise prices.

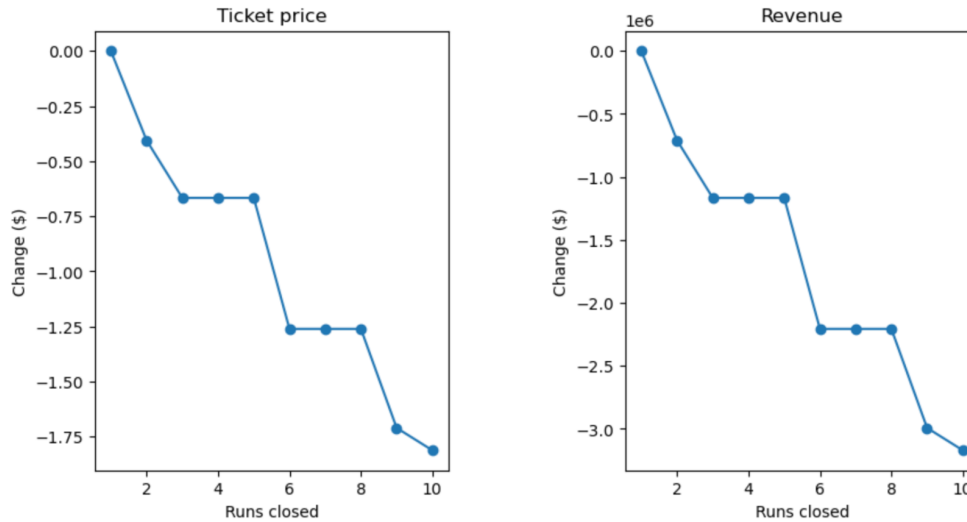
Several issues were identified after the initial visualization of the ski resort data was completed. Ticket price for the resorts was presented in two separate columns of weekday and weekend adult prices. This raised the question of how the data should be modeled around those two columns. Missing data was quantified for each column, which identified about 15 to 16% of the values in the price columns were missing. Other columns were missing as much as 50% of values, which prompted an investigation into how those values were recorded in the data set. Further evaluation of the ticket prices presented that the two prices varied significantly by state. Of the ticket prices that were missing in the data set, 14% were missing both values. After the evaluation of the distribution of those records in other features of the data set they will be dropped.

Distributions of the other columns were visualized to get a quick snapshot of how plausible the data was and if any outliers needed to be investigated. With the data relatively free of major concerns, statistical analysis was performed on state-wide features. After the data set was thoroughly investigated, population and area data for each state was added to the ski resort data. With all of the necessary columns with the correct data for each state, there is more context to better explore the data.

Relationships between states and the resort features were explored. Ratio features were also introduced to the data set. Melting the ticket prices between prices during the week vs the weekend helped get an idea of what factors affect ticket price over all. Correlations between ticket price and fast quads, total chairs, vertical drop, runs, and snow making stood out. With the new data, the ratio of night skiing per state seemed highly correlated with price and points to increasing night skiing may be a way to justify higher prices. Number of chairs relative to the number of runs in relation to ticket price presented as counterintuitive. It is important to take into account the context of how visitors will be able to interact with the number of features available.

The shortlist of options the business proposed and their results were:

1. Permanently closing down up to 10 of the least used runs. The model says closing one run makes no difference. Closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes down 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.



2. Increase 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. This scenario increases support for ticket price by \$1.99. Over the season, this could be expected to amount to \$3474638.

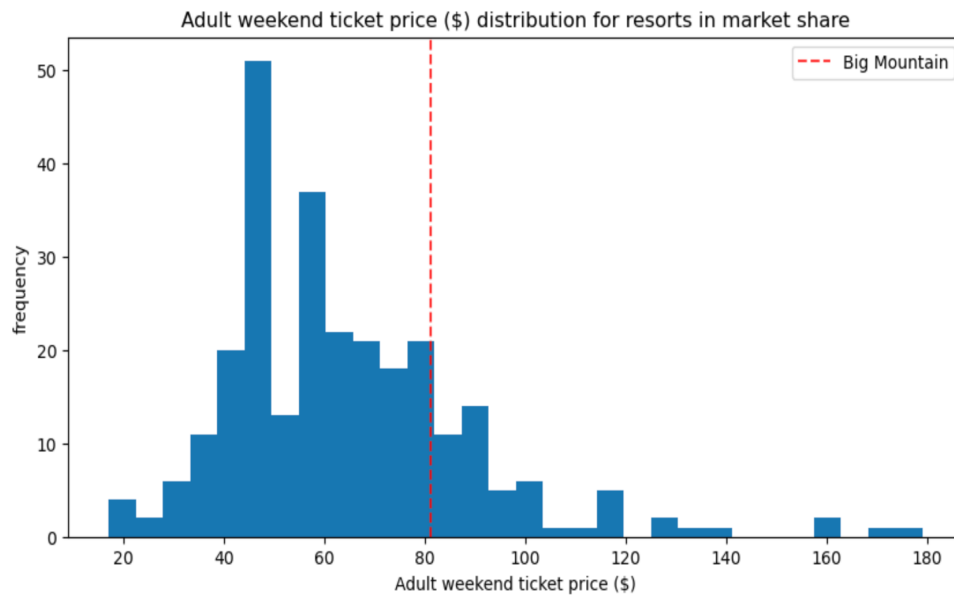
3. Same as number 2, but adding 2 acres of snow making cover, which makes no difference.

4. Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres, which also makes no difference.

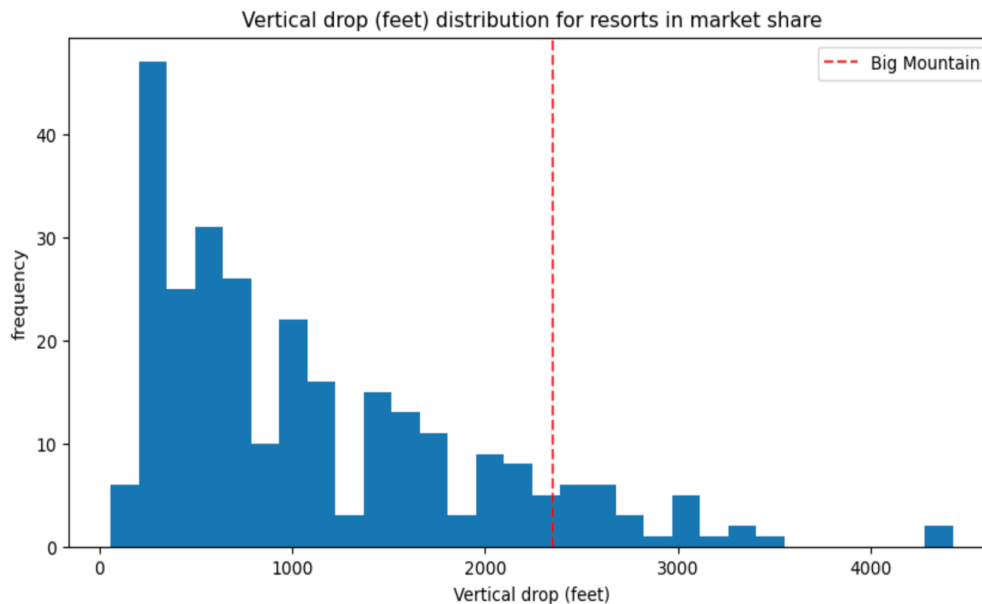
Big Mountain currently charges 81 USD for their tickets. Big Mountain Resort modeled price is \$95.87, even with the expected mean absolute error of \$10.39, this suggests there is room for an increase. Modeling indicated if the vertical drop is increased by adding a run to a point 150 feet lower down, requiring the installation of an additional chair lift to bring skiers back up, it can be done without additional snow making coverage. This scenario increases support for ticket price by \$1.99. Over the season, this could be expected to amount to \$3,474,638.

Key Figures:

Big Mountain has comparable pricing to many other resorts, but has some more favorable features that points to an increase in ticket price.



Big Mountain does pretty well for vertical drop, even though there are still quite a few resorts with greater drops.



Big Mountain has some of the highest number of total chairs, resorts with more appear to be outliers.

