Big Mountain Resort

Problem Statement

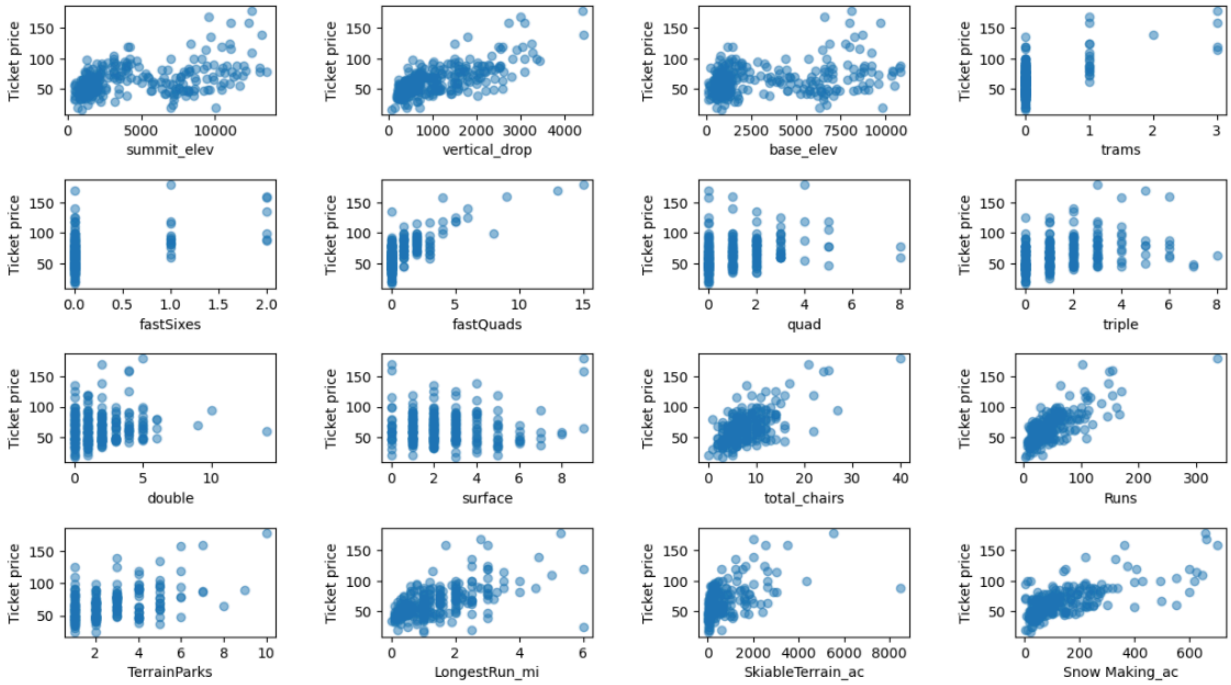
Our goal is to increase revenue at Big Mountain Resort by decreasing operations costs or justifying ticket prices based on amenities and market average.

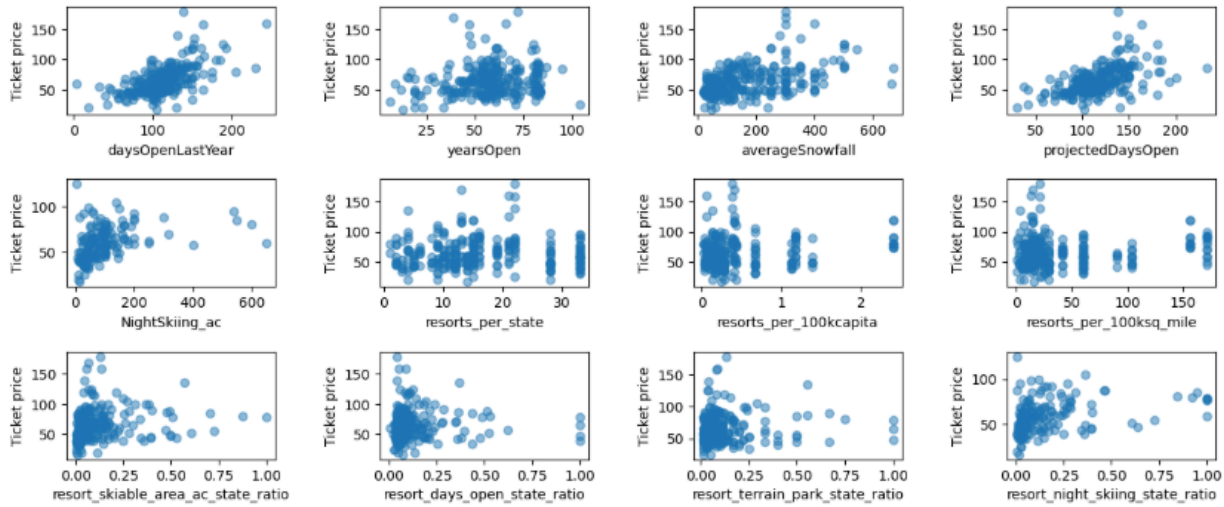
Data Wrangling

There were originally 329 rows and 27 columns of data, Big Mountain Resort was one of them. The columns fastEight was removed because it lacked data. Also, all rows that did not contain weekday prices were dropped because that is our main measurement we are using. One row that contained a resort age of over 1000 was dropped because it was an outlier.

The remaining data found in the tables columns seems to correlate to bell curves or skewed distributions. This is a good indicator that the data is relatively clean to be used for analysis. Adult weekend ticket prices correlated to weekday prices almost 1 to 1, which is why we decided to use weekend prices for the standard ticket prices.

Exploratory Data Analysis





The data was scaled to compare different variables. 4 states were the main contribution to PCA variance. However, they are not significant outliers. States do not need to be used to determine ticket prices.

Ratios were created for skiable area, resort days open, resort terrain, resort night skiing, and total resorts when compared to their respective state total values. Also resorts per 100,000 capita and 100,000 square miles ratios were created.

When creating a heat map comparing all variables, and scatter plots (seen above) comparing variables to ticket prices the following was observed. Ticket prices seemed to correlate most with total chairs, total runs, night skiing, snow making, vertical drops, and fast quads.

Modeling

Modeling was tested by taking the average price of tickets and comparing it to variables in a linear regression model. The median was also looked at. The median showed a better cross validation score with a lower standard deviation (STD). So the median of values was chosen to be used.

After analyzing the linear regression model using the median, it was found that based on the best K values, vertical_drop, Snow Making, total_chairs, fastQuads, and Runs have the highest correlation coefficients compared to ticket prices. Also k = 8 is optimal. This model's absolute error was $10.50 with an STD of 1.62.

The random forest regressor was also tested and showed significant correlations with fastQuads, Runs, Snow making, and vertical_drop had the

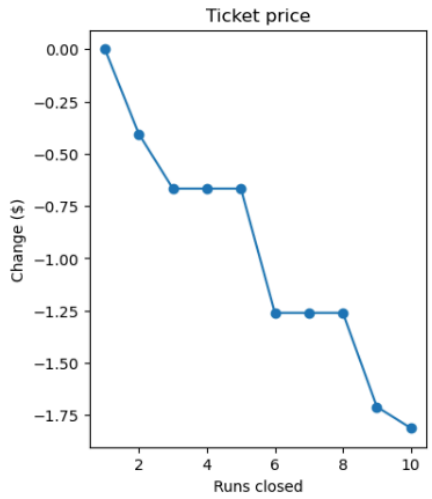
highest correlation to ticket prices. The random forest model had the same indicators with a lower error margin (mean absolute error = $9.64, STD = 1.35) so it was chosen to be used as the final model.

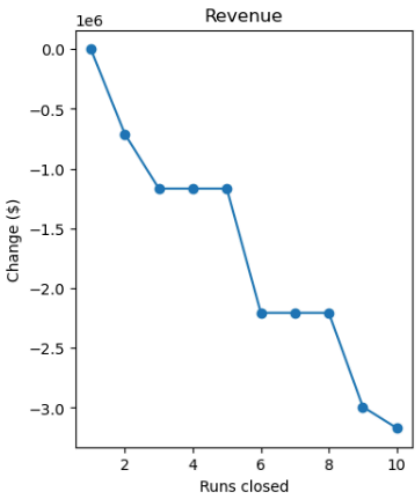
Results

Big Mountain Resort modelled price is $95.87 and its actual price is $81.00. Even with the expected mean absolute error of $10.39, this suggests there is room for an increase.

Big Mountain resort currently sits on the higher end for ticket prices, especially for Montana. But it also sits on the higher end of vertical drops and other indicators that were used.

Based on each visitor being at the resort for 5 days, closing up to 4 runs would not affect ticket prices significantly, but closing 10 runs could as seen in the following graphs.





This data is lacking the current resort visitor totals per season, and also total operating costs. It also lacks max resort capacity. The data does not have the information to determine the break even point in profits.

Also Big Mountain is already one of the most expensive resorts. The model says that ticket prices could be raised by around $15. However the error range for the model is still $10. Big Moutnain's tickets are within 2 standard deviations of the model price. This indicates that $81 is not significantly low for what the resort has to offer, but on the lower end compared to others.

So I would suggest closing runs and keeping ticket prices the same over opening a new one.

This model can be made into a program that requests categories from the current table, and delta values. The executives can then easily use the model to predict price changes independently.