Big Mountain project report

The original dataset consisted of 330 ski resorts (including our Big Mountain). The data on these resorts were listed in 24 numerical columns, along with the state and the region. The database was established to be non-redundant (all resort entries were unique). Among the numerical data, about 10% was missing. In particular, nearly 15% of the resorts had no data on ticket prices and had to be removed.

The dataset had 2 price columns: weekday prices and weekend prices. In some cases the prices are identical; in others weekend prices are higher to a varying extent (Big Mountain resort charges $81for both weekend and weekday tickets). It was decided to focus on the weekend prices as fewer values were missing in that column. Therefore, the weekday price column was dropped as were the 4 resorts where the weekend price was missing.

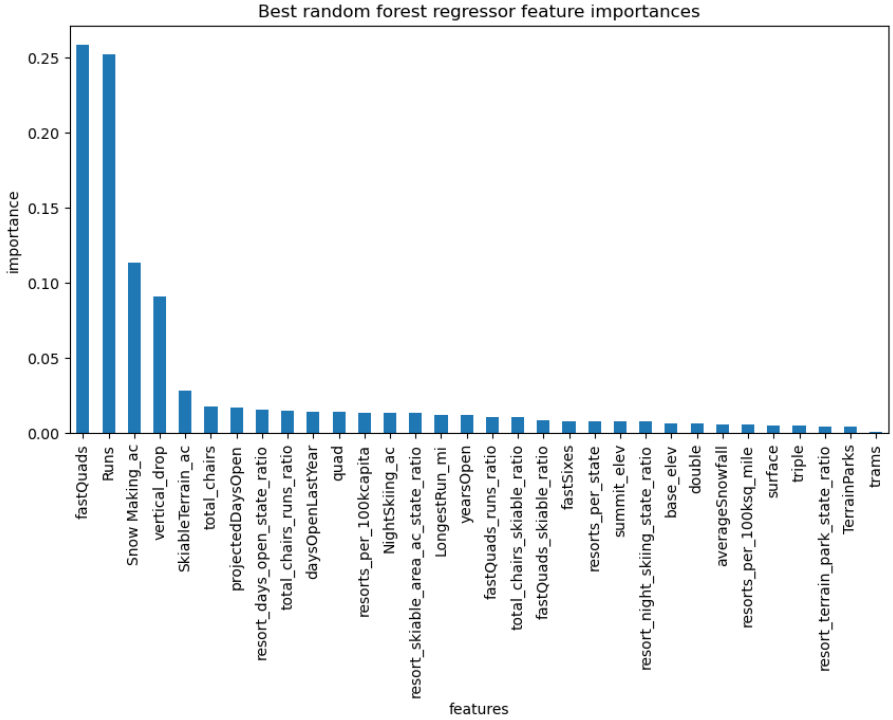
After cleaning the dataset had 277 resorts and 22 columns with numerical parameters as well as information about the state and region for each resort.

Then the data were analyzed on a state-wide basis to see if there is any correlation between the state and the average ticket price for that state. No such correlation was found and in the following steps all resorts were treated equally, regardless of states in which they were located.

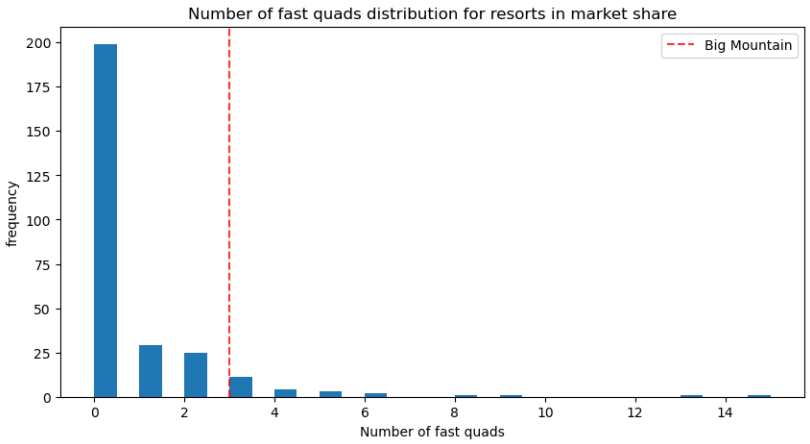
Then a regression model was built and it identified the following 4 features as the most important for determining the ticket price:

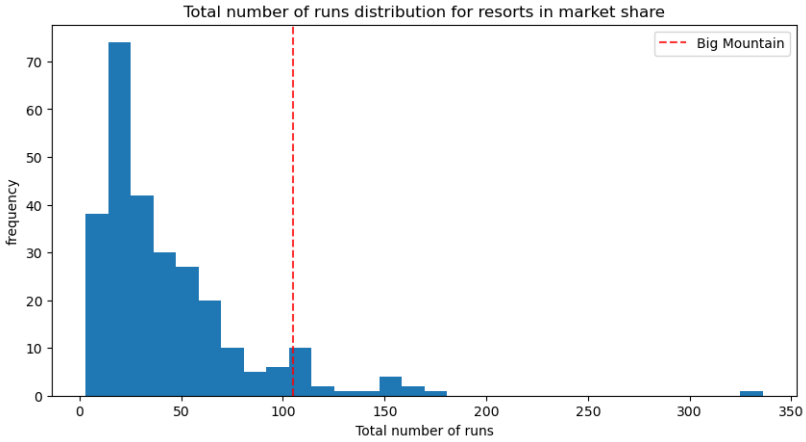
- Number of fast quads
- Total numbers of runs
- Snow making area
- Vertical drop

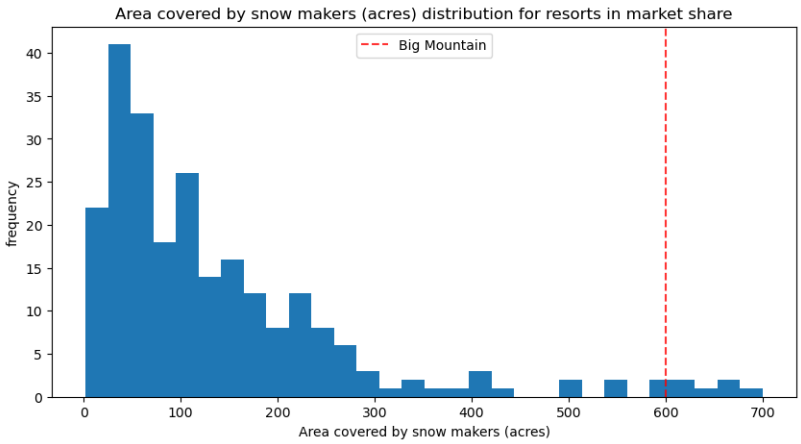
The relative importance of all features is plotted below:

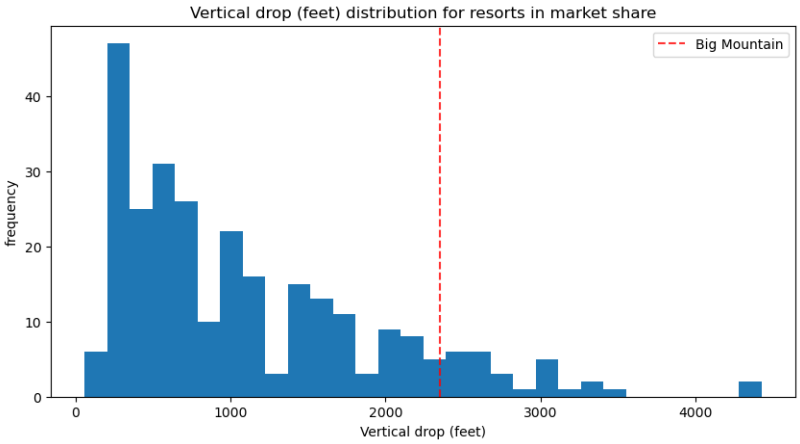


Applying the model to the Big Mountain features suggests the new price of $95.87, with the mean absolute error $10.39. Indeed, as far as the above parameters are concerned, Big Mountain resort is in top 10-20% of all resorts in its market share:









Four additional scenarios were modeled:

1. Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.
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
3. Same as number 2, but adding 2 acres of snow making cover
4. Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

In scenario 1, closing just one run makes no difference in the modeled price. Closing 2 or 3 runs successively reduces the modeled price (and correspondingly, the revenue), but by a very small amount, < $1. Closing 4 or 5 runs makes no difference compared to only 3 runs closed. The largest drop in the modeled price is observed between 5 and 6 runs closed. Closing 7 or 8 makes no difference compared to only 6 runs closed. If all 10 runs are closed, the drop in the modeled price is nearly $2 and the expected revenue would decrease by > $3 million. So the decision would eventually come down to how much in operating costs may be saved by closing runs.

Scenario 2 supports a $2 increase in the ticket price, thus generating nearly $3.5 million in extra revenue. That would be more than enough to cover the operating costs for an additional chairlift ($1,540,000).

Scenario 3 makes no difference compared to scenario 2. Neither does scenario 4 as compared to the status quo.