Big Mountain Resort Analysis

Problem Statement:

How can Big Mountain Resort update its ticket prices to better utilize its facilities such as vertical drop, chair lifts, etc.

Context:

Currently Big Mountain Resort prices its tickets by charging an above average price in its market segment.

Scope:

The dataset only allows us to impact ticket prices to increase revenue

Constraints:

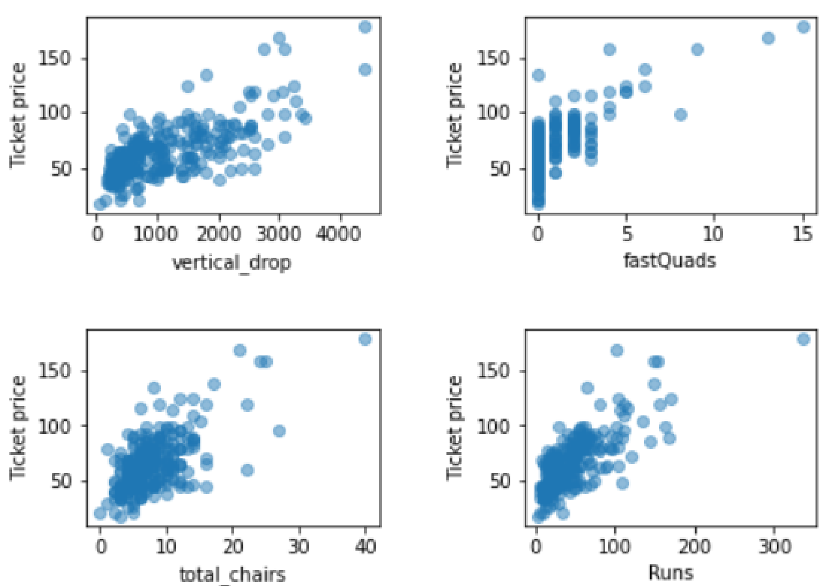
Big Mountain Resort is already the highest ticket price in its state at $81 for adults.

We are given a very limited sample to work with (330 resorts).

Data Wrangling:

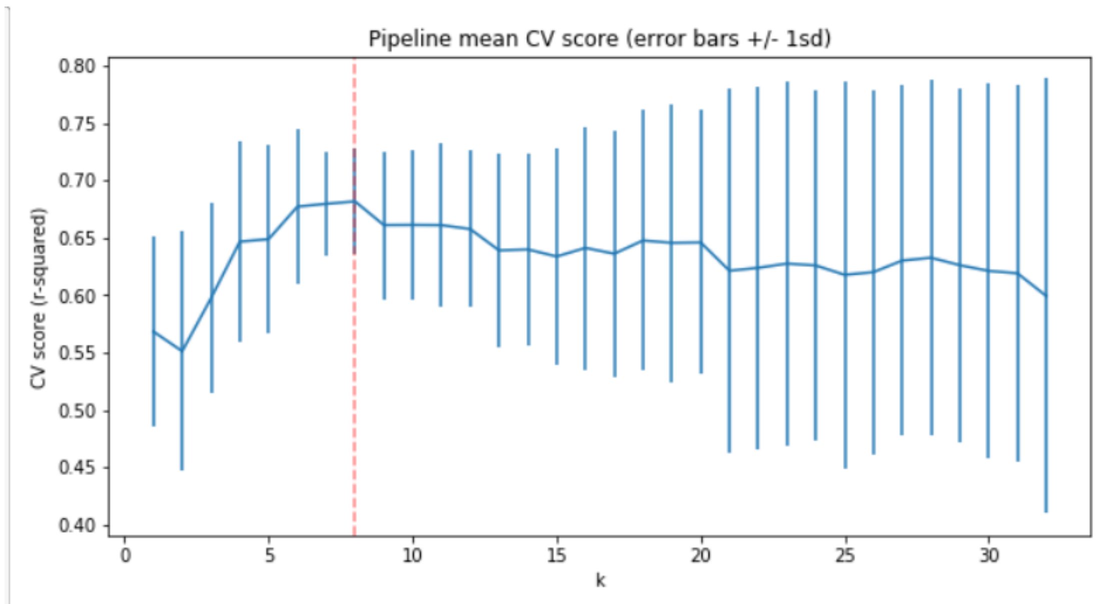
The dataset given shows that Montana (the state in which Big Mountain Resort resides) has 12 total resorts, including our target resort. Of these 12 resorts, Big Mountain Resort is the most expensive resort at $81 which is well above the range of the other resorts in Montana. Montana also has an interesting property in that both the weekend and weekday prices are the same. Given this, the remainder of the analysis will use weekend prices as there is no change for Big Mountain Resort and there are more general observations of weekend prices compared to the weekday counterpart.

Data Exploration:



There are a few features that seem to have a decent correlation with Ticket Prices. For example, looking at the graph above, both Runs and total_chairs indicate a decently high correlation. These may be potential features to use when creating a model for Ticket Prices but more in depth investigation will be needed during the preprocessing stage.

Preprocessing:

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vertical_drop        10.767857
Snow Making_ac        6.290074
total_chairs          5.794156
fastQuads             5.745626
Runs                  5.370555
LongestRun_mi         0.181814
trams                -4.142024
SkiableTerrain_ac    -5.249780
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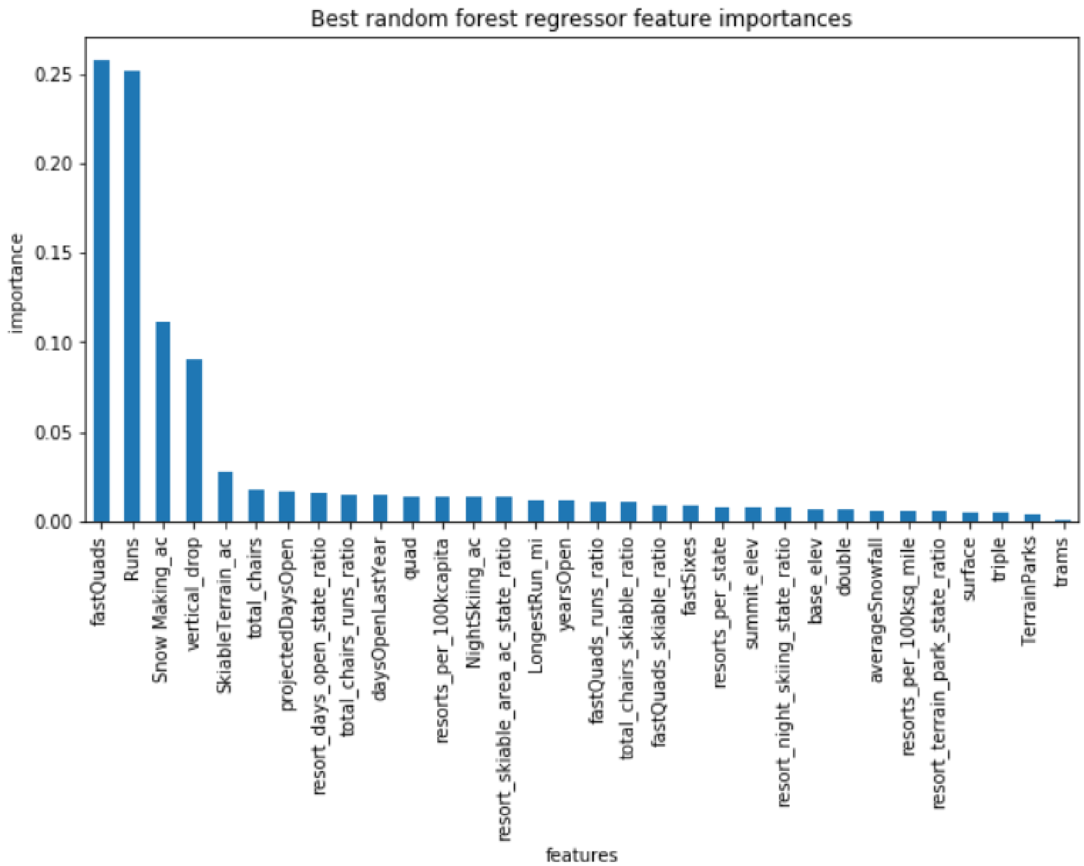
There are two potential models to decide from. One is a linear regression model and the other is a random forest model. Looking at the above graphs, a cross validation of k = 8 shows the best r-squared score for linear regression. In addition the figure above shows which features provide the highest change in ticket prices when changed. However, when comparing the error between the linear model and the random forest model, the random forest model gives us a more accurate prediction so we will go with the random forest model.

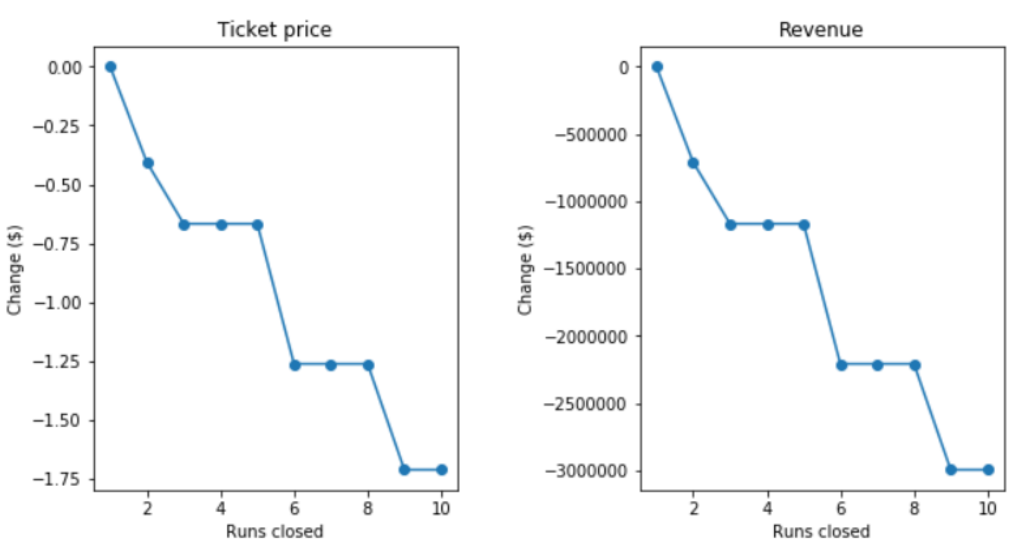
Looking at the bottom figures, there are a few features that provide high information in predicting ticket prices. For example, fastQuads, runs snowmaking, and vertical drop have the highest importance for predicting ticket prices which are also important features in the linear model as well.



Model:

Now that the model has been created we can now test it against various scenario that the business wants to try to increase revenue and ticket costs.

Scenario 1:



The first scenario is closing the top 10 least used runs. Utilizing the model, it shows that closing 1 run will cause no change in ticket prices which in turn means no change in revenue gained through tickets. However, since data for costs of using each run is not given it is not possible right now to determine how closing each run would reduce costs and therefore increase revenue. After 1 run is closed, each subsequent closed run either reduces the ticket price or causes no change from the previous closed run.

Scenario 2:

The second scenario is adding a run, increasing the vertical drop by 150, and installing an additional chair lift. This scenario would increase ticket prices by $1.99 which in turn would increase the yearly revenue by $3474638. As mentioned in the previous scenarios there are no given costs for each feature so it is difficult to determine how these additions would affect the revenue on the costs side.

Scenario 3:

The third scenario is the same as scenario 2 but also includes adding 2 acres of snow making. This scenario causes the same changes as scenario 2 but due to the addition of adding 2 acres of snow the costs would likely be higher than scenario 2 so this one should not be implemented.

Scenario 4:

The fourth scenario is adding .2 miles to the longest run .2 and an additional 4 acres of snow making. This scenario causes no changes to the original ticket price while also incurring additional costs due to the added increases in features which indicates that this should not be implemented.

Of these four scenarios Scenario 2 would give us the highest increase in ticket prices while also minimizing potential additional costs that scenario 3 would cause.