Big Mountain Resort Ticket Prices

How can we use a Data Driven approach to better select Ticket Pricing?

Are Big Mountain's Tickets priced appropriately?

- Building a new chair lift - Increasing operational costs by 1.5 million
- Many in upper management already believe pricing may be optimized given our context in the greater ski resort market segment
- Is their statistical evidence to increase our ticket prices?

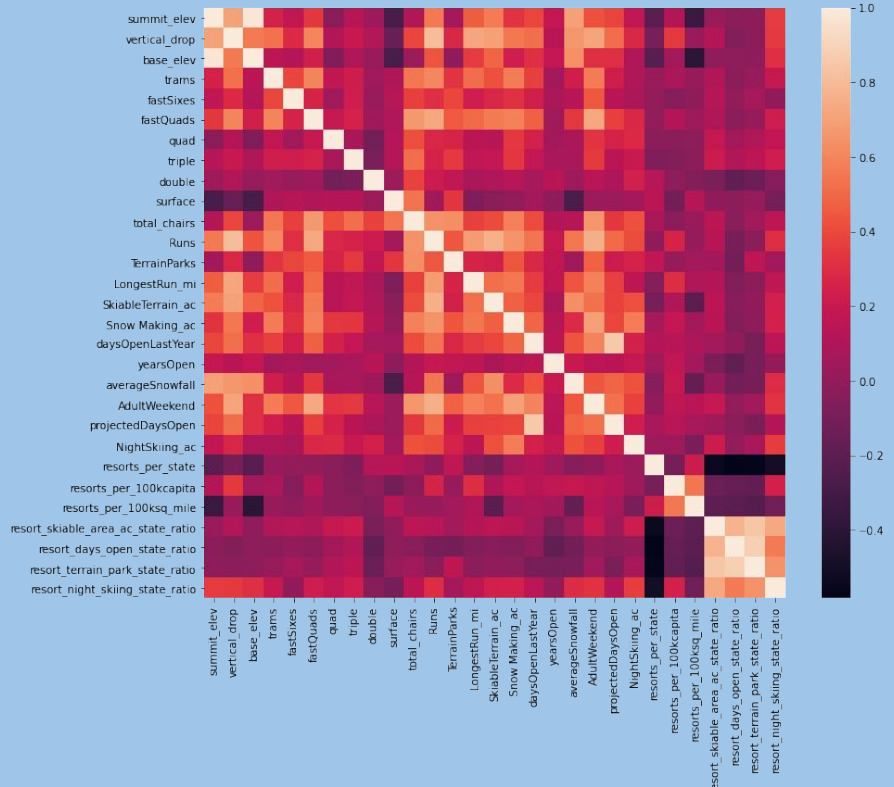
Solution : Use data driven approach to select best pricing

- Use a dataset from a csv file provided by Database Manager (Alesha Eisen)
- Dataset contains data on 330 ski resorts in the USA
  - Includes Big Mountain
  - Consists of a variety of facts, figures and facilities - such as number of ski runs, skiable area, years open, number of each lift type and of course ticket prices
- Use this data to create a model to predict ticket pricing - essentially comparing Big Mountain to the other resorts numerically

The final model strongly supports an increase in Ticket prices

Currently our ticket are priced at $81. The model predicts a price of $95.87 (with an error of about +/- 10 dollars)

How do ski resort features relate to Ticket Prices?

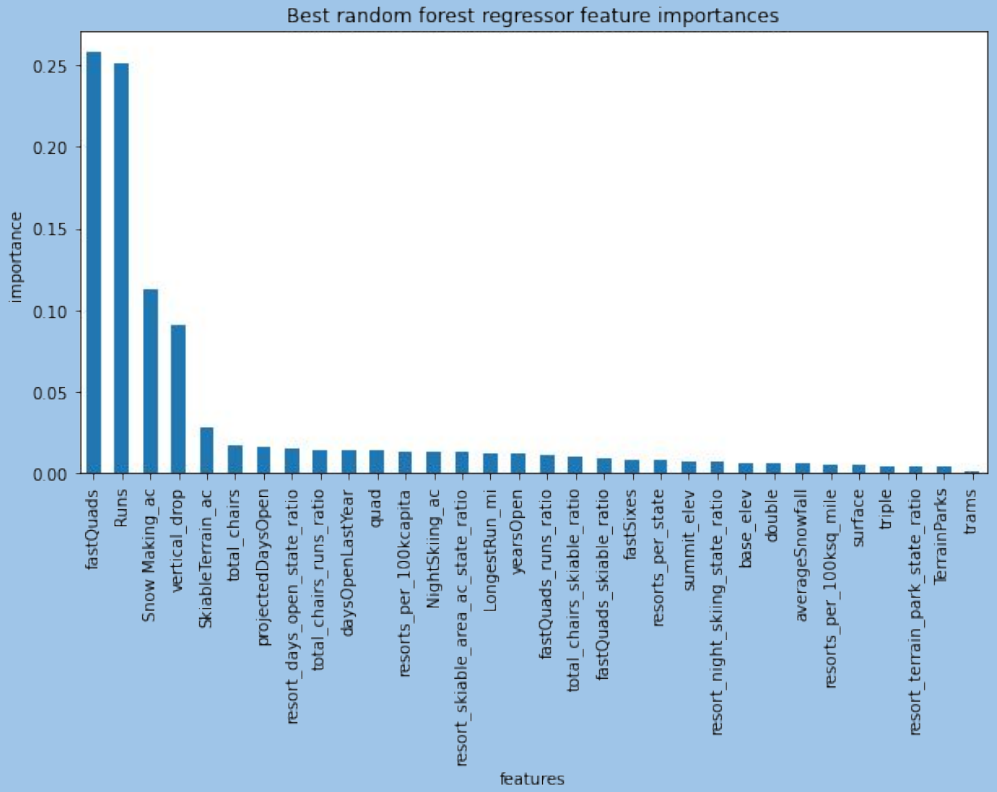


- The image on the right contains a correlation heatmap of the features in our final dataset
- AdultWeekend is our target feature (Big Mountain's weekend ticket prices) - weekend was chosen over weekday simply do to having more complete data
- The lighter the color the stronger the positive correlation

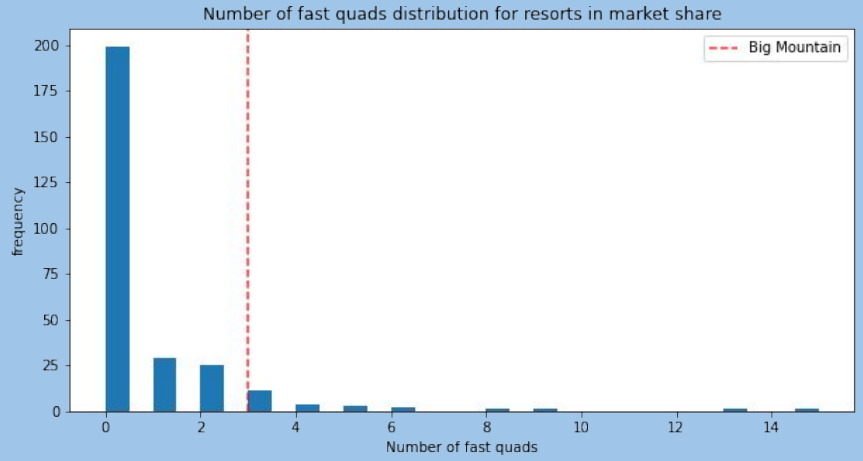
Building Machine Learning Models

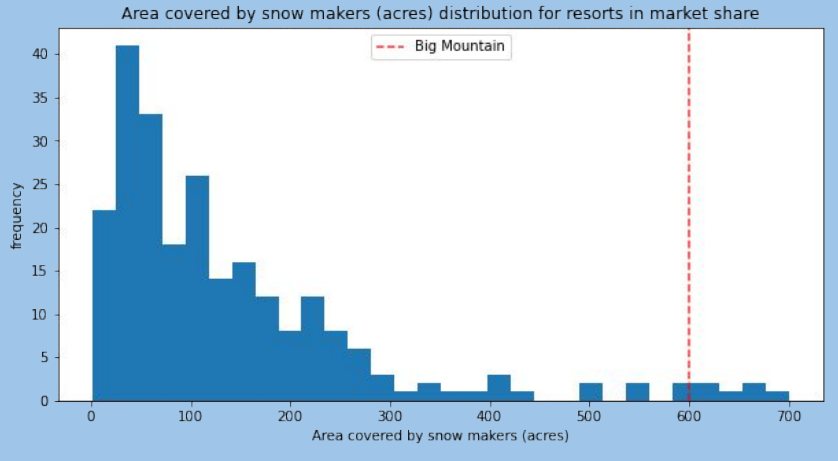
- Several models were built and tested - but the final choice was between two primary models
  1. Linear Regression Model - Simple, fast and relatively easy to tune
  2. Random Forest Regression Model - More complex, slower, requires more tuning but is often very effective
- Both models were examined, tuned and iterated over to find the best hyperparameters to increase their predictive accuracy (in this case predicting ski resort ticket prices)

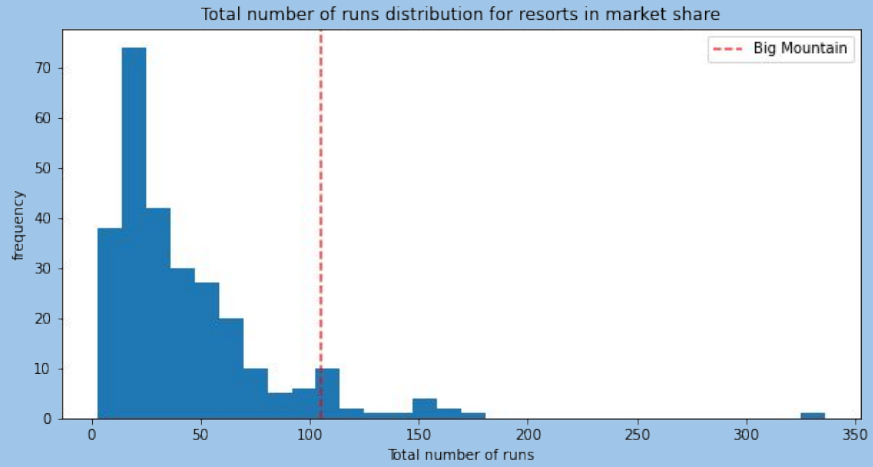
Choosing our Final Model - Random Forest Regressor

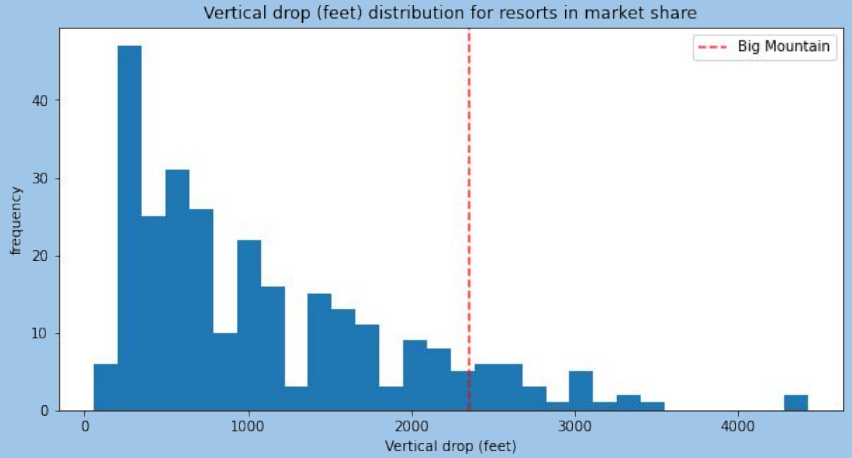


- The final two models were both pretty effective
- Random Forest Regressor was simply more accurate and scored better on all evaluation metrics - (mean absolute error, coefficient of determination R^2 etc.)
- The image highlights what features of ski resorts were most important in the Random Forest model - (essentially what factors correlate with higher ticket prices)


Number of fast quads distribution for resorts in market share
Big Mountain
frequency
Number of fast quads
0
25
50
75
100
125
150
175
200
0
2
4
6
8
10
12
14


Area covered by snow makers (acres) distribution for resorts in market share
Big Mountain
frequency
Area covered by snow makers (acres)
0
5
10
15
20
25
30
35
40
0
100
200
300
400
500
600
700


Total number of runs distribution for resorts in market share
Big Mountain
frequency
Total number of runs
0
10
20
30
40
50
60
70
0
50
100
150
200
250
300
350


Vertical drop (feet) distribution for resorts in market share
Big Mountain
frequency
Vertical drop (feet)
0
10
20
30
40
0
1000
2000
3000
4000

- The figures on the previous slide highlight how Big Mountain compares to the other ski resorts in the dataset in the most important features in our final model

- Big Mountain lands in the upper quartile or higher in the four most important features! - Thus it makes some intuitive sense why it predicted a higher ticket price

Summary and Final Recommendation

- Our task was to find out if Big Mountain's ticket prices are properly set given what it has to offer compared to its competitors - ideally resulting in evidence for an increase to cover new operational costs
- Several models were built using a dataset covering 330 ski resorts across the country and the best/most accurate using evaluation metrics was chosen
- The model predicts a price of $95.87 (with an average error of about $10) and therefore supports an increase in ticket prices from the current price of $81
- We recommend Big Mountain increase their ticket prices to better take advantage of their facilities, features and market position