Predicting Ticket Prices for Big Mountain Resort

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Context

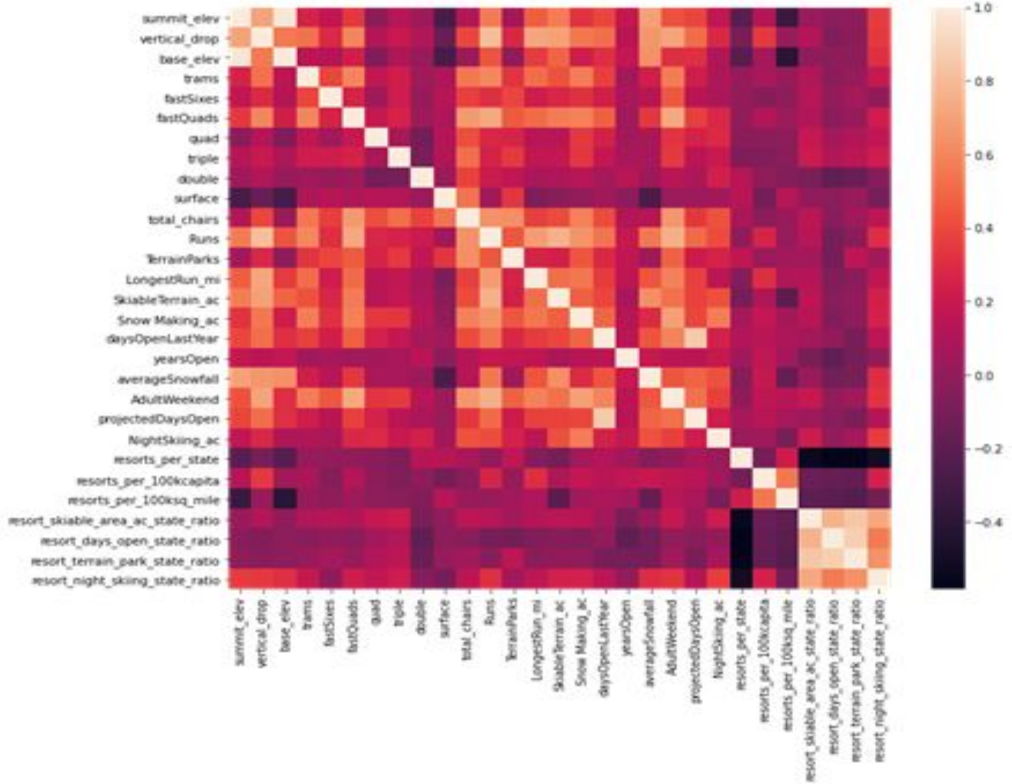
- Big Mountain Resort, one of 12 summits in Montana, is struggling to make gains off of its current state
- Located near extremely popular tourist attractions: Glacier National Forest and Flathead National Forest
- Every year on average 350,000 visitors come to ride and explore the mountain
  - 105 runs
  - 14 total chairs
  - 3000 acres of skiable terrain
  - 600 acres of night skiing
- Current Ticket price for Adult Weekday and Adult Weekend: $81
- Most Expensive Resort in Montana

Problem Statement

- Develop a new strategy for determining a fair ticket price and/or cut costs to ensure BMR has a net profit
- Compare BMR with its competitors
- Identify any key features that help boost the ticket price and summit revenue
- If established, quantify how much needs to be changed

Data

- 330 resorts across America with 27 features
  - number of runs
  - size of snowmaking terrain
  - number of fast quads
  - area for night skiing
- Compare BMR with other summits
- Look for correlation between key aspects and ticket price
- 70% for training set, 30% test set

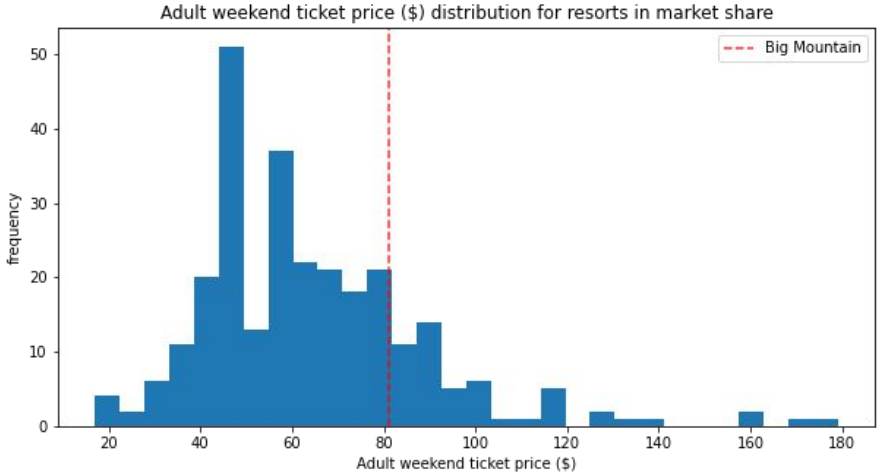


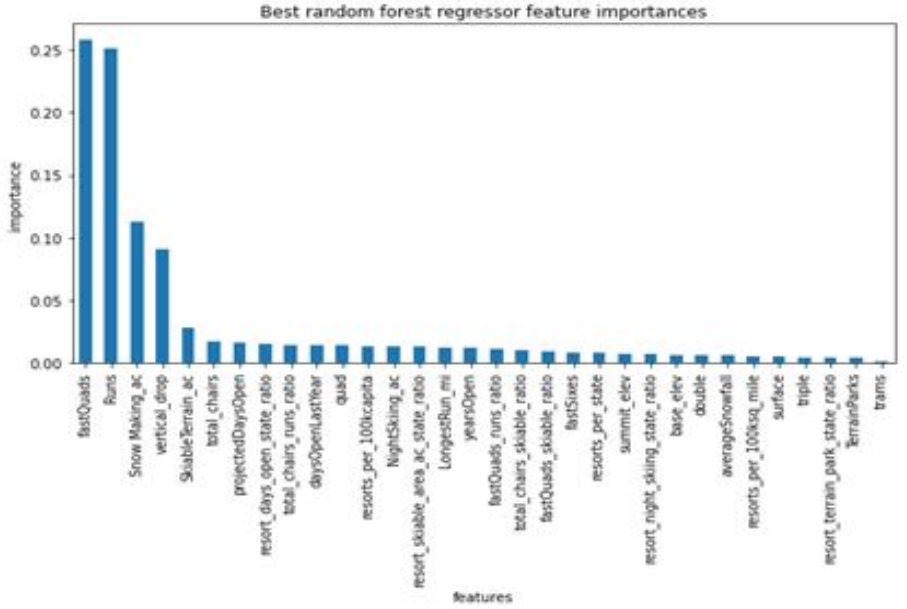
Models

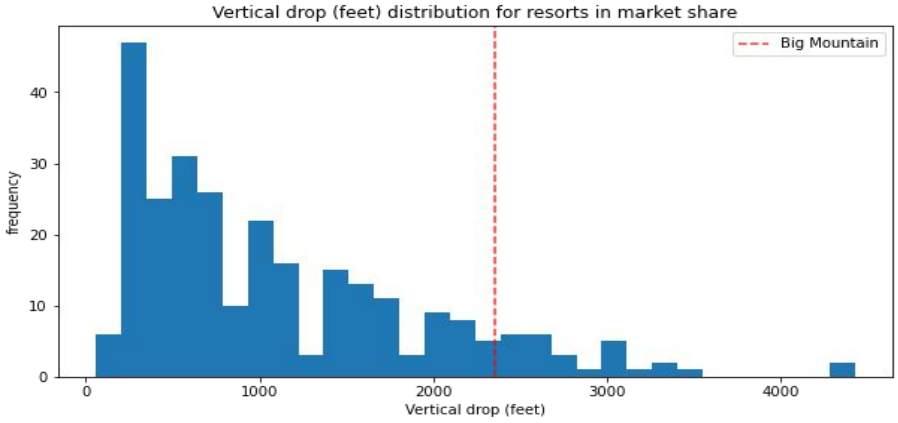
- Ran a simple linear regression model
  - 80% of the variance was covered for the training set
  - 70% of the variance was covered for the test set
- Ran a Random Forest model
  - Better CV results
  - More options to tune
- Number of fast quads, number of runs, snow making area, and vertical drop

	Linear Regression	**Random Forest**
Mean Absolute Error	11.793465668669327	9.537730050637332
Mean, Standard Deviation	(10.499032338015291, 1.6220608976799664)	(9.644639167595688, 1.3528565172191818)

Charts

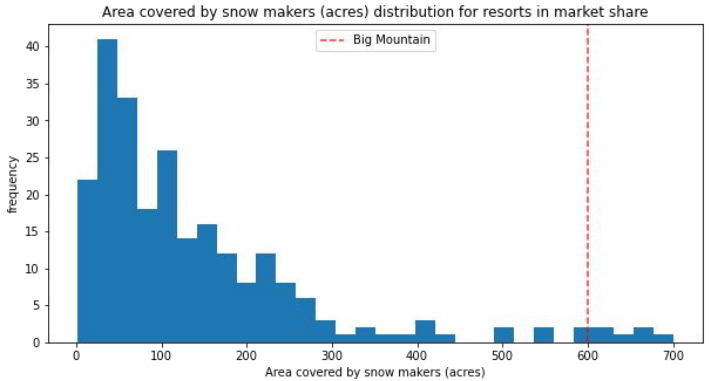


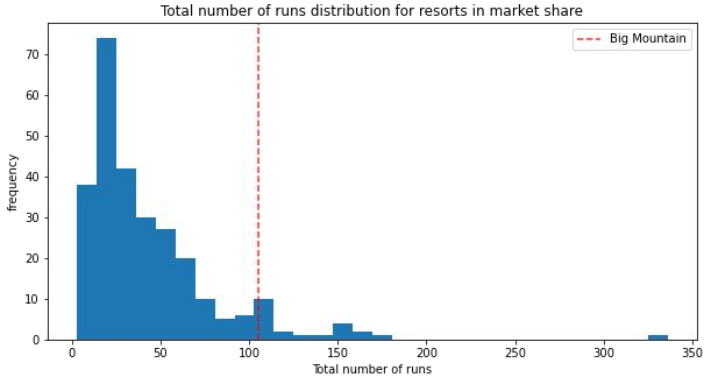


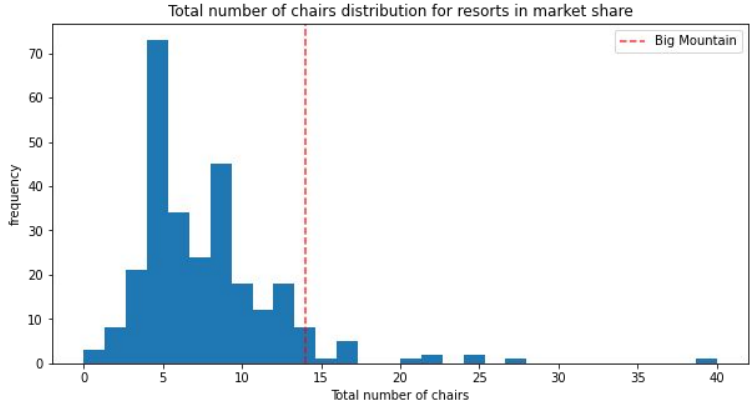


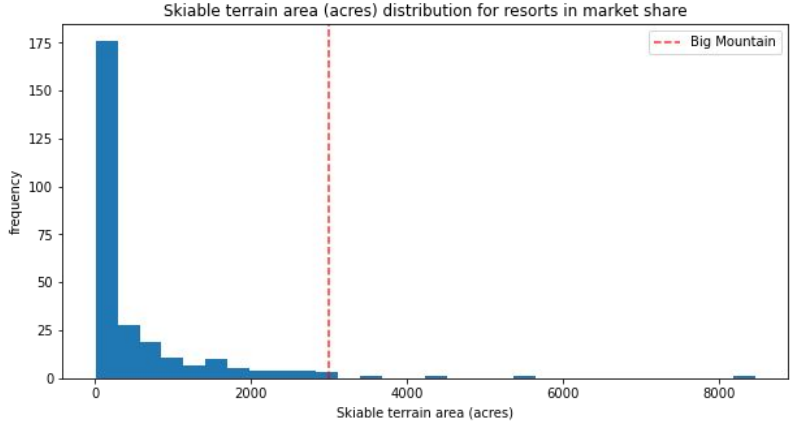
- These visualizations display where BMR is situated amongst its opposition
- Above average in most sectors

Charts (cont.)


Area covered by snow makers (acres) distribution for resorts in market share
Big Mountain
frequency
Area covered by snow makers (acres)


Total number of runs distribution for resorts in market share
Big Mountain
frequency
Total number of runs


Total number of chairs distribution for resorts in market share
Big Mountain
frequency
Total number of chairs


Skiable terrain area (acres) distribution for resorts in market share
Big Mountain
frequency
Skiable terrain area (acres)

Results & Suggestions

- Refitted the model after removing Big Mountain Resort from the dataset
- Closure of runs only yield to cheaper tickets and loss in revenue
- In similar manner, by adding one more run, 150 more feet to the vertical drop, and one more chair can make up for a $1.99 increase in ticket price which in turn yields to $3,474,638 for the whole season
- Tried adding a couple more features such as extending the longest run by 0.2 miles and snow making area by 4 acres
- 44% of revenue gains will be redirected towards operational costs
- Modeled ticket price is much higher than actual price meaning BMR could be undercharging
- Raising prices while expanding on a couple facilities generates net profit

Conclusion

- After research, we found adding one more run, one more chair, and 150 feet to the vertical drop, BMR will gain $1,934,638 over the course of one season
- BMR on average is above the mean in all aspects
- Closure of Runs isn’t helpful
- Random Forest Model gave better results with a lower MAE
- Model is adjustable