Big Mountain Resort: Guided Capstone

Problem Statement

Is Big Mountain Resort's current ticket pricing appropriate given the resort facilities compared to pricing at other resorts?

Model Conclusion

Big Mountain Resort's current accommodations could support a ticket price increase of $14.87. Given the season's expected visitor count of 350,000 and an average stay duration of 5 days per visitor, this ticket price increase would **provide an additional $26,022,500 in revenue**, more than offsetting the increased operation cost of the additional lift and more.

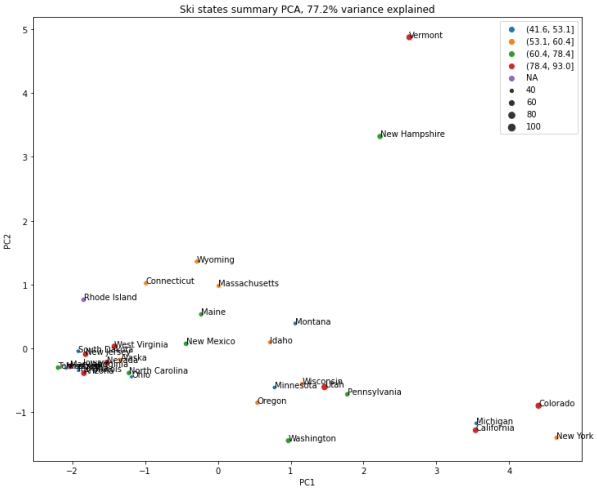
Input Data

We were provided with a dataset featuring 330 ski resorts across the US and various attributes for each resort. The included attributes could be grouped into the following categories:

- Location
- Visitor transports
- Terrain
- Seasonal/Weather features
- Weekday/Weekend pricing

Our target features were the two pricing columns, although during the EDA phase we found we could combine these pricing columns into one to simplify the model.

To make sure we took state variations into account, we imported an additional publicly available dataset with state populations and surface area. Looking at the scatterplot to the right, we were able to determine that the resort's state would not be a strongly predictive factor on pricing, and we were able to incorporate the state feature into engineered features that provided more useful data.



Most Influential Features

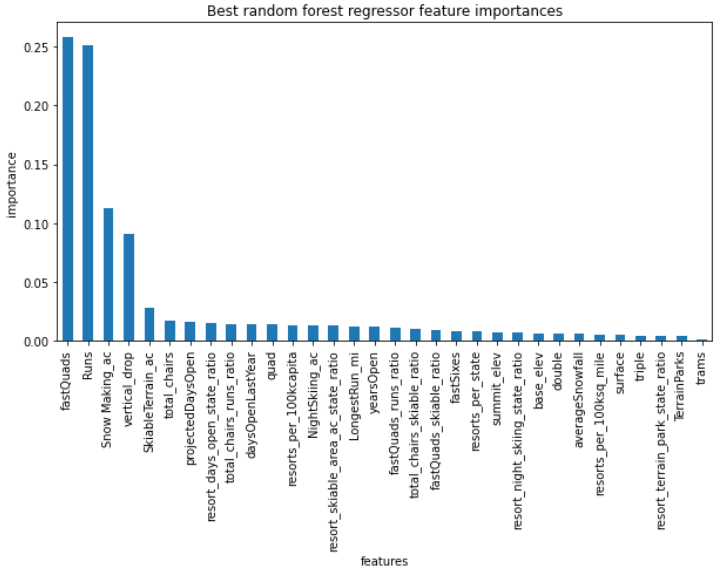
After working through two modeling approaches, first a linear regression and then secondly a random forest model, we found that both models agreed on a majority of the highly important

features but that the random forest model had a better MAE and was able to predict pricing better by about $1.00 versus the linear model.

Model	MAE (test set)	MAE mean	MAE std
Linear reg	$11.79	$10.50	$1.62
Random forest	$9.54	$9.64	$1.35

The top 4 features for the random forest model were:

1. Number of Fast Quads
2. Number of Runs
3. Acreage of Snow Making
4. Vertical Drop



[View full-size image here.]

Provided with these features, it became clear that Big Mountain's pricing was set lower than the market would allow with the model suggesting a price increase of $14.87/ticket. While this highlights that Big Mountain has been underpricing tickets, it would be important to follow up the price increase with analysis on the impact of expected visitor numbers. Since this new price of $95.87 puts Big Mountain in the top pricing tier of resorts in the country, there may be risk that the market will not absorb that increase without some decrease in visitor totals despite the facilities on-resort showing strong support for the increase. Also for consideration, if the visitor numbers only slightly decrease where the net revenue impact is still positive, then the perceived visitor experience may be more positive due to reduced crowds which will lead to a better resort reputation even if the short-term effect would be lower visitor counts.

Additional Considerations

Outside of just the review of ticket prices, there were some added scenarios that were analyzed with the following conclusions:

Scenario 1: What is the impact of permanently closing up to 10 of the least used runs?

This approach could be done in a stepwise fashion to closely monitor impact on pricing. [Additional detail can be found here.]

Scenario 2: What if we increased vertical drop with an additional chair lift?

Increasing the vertical drop by 150 ft and adding a chair lift would increase the modeled ticket price by $1.99, which would amount to an additional $3,474,638 over the season.

Scenario 3: Consider Scenario 2 but with an additional 2 acres of snow making cover?

The additional snow making acreage would not impact the modeled ticket price at all, so this would be identical to the Scenario 2 impact but with added costs.

Scenario 4: What if we increased the longest run by 0.2 miles which would require 4 more acres of snow making?

Given the low impact of snow-making acreage and the small adjustment to longest run, this scenario would also not show any impact to the modeled price.

Scenario Conclusion

It would be most impactful to begin with Scenario 2 since that involves the most positive impact on net revenue. Scenario 3 is not necessary since it only adds cost with no benefit. Scenario 4 is neutral, so it should only be considered if there are other factors outside of profit.

While Scenario 1 would lower the expected value of a ticket, the closures can be done in waves to monitor the real-world effect. This can be done either in tandem with Scenario 2 where the overall impact would net positive, or it can be done following Scenario 2 for the purpose of cleaner analysis.