Big Mountain Resort Executive Presentation

Guided Capstone
Springboard
AG
2021

Steps

For an executive presentation, start with the problem identification and your recommendation before moving into how you arrived at that recommendation. Here is how we recommend you structure your slide deck:

- Problem identification (1-2 slides)
- Recommendation and key findings (1 slide)
- Modeling results and analysis (3-4 slides)
- Summary and conclusion (1 slide)

Problem Identification

Big Mountain suspects it may not be maximizing its returns, relative to its position in the market. It also does not have a strong sense of what facilities matter most to visitors, particularly which ones they're most likely to pay more for. This project aims to build a predictive model for ticket price based on a number of facilities, or properties, boasted by resorts (*at the resorts).* This model will be used to provide guidance for Big Mountain's pricing and future facility investment plans.

Recommendation and Key Findings

The key findings are, New York accounts for the majority of resorts, Montana is in 13th place. A resort's State is a useful predictor of ticket price, but we don’t want a model that is skewed for accuracy. Creating a Montana-specific model would slash your available data volume, but it would be good to create one as well.

Our modeling suggest a ticket price of $95.87 could be supported in the marketplace by Big Mountain's facilities?.

Modeling Results and Analysis

We used a Random forest model, specifically 5-fold cross-validation and GridSearchCV.

The preprocessing steps were:

1. Feature scaling
2. Trying both the mean and median as strategies for imputing missing values (#SimpleImputer() with a strategy of 'median' StandardScaler(),
3. Trying RandomForestRegressor() with a random state of 47.

The preprocessing using the mean was marginally better.

Modeling Results and Analysis

- The random forest model has a lower cross-validation mean absolute error by almost $10, and has less variability.
- Performance on the test set was consistent with the cross-validation results, and only marginally improved upon the default CV results.
- The model initially improved but then levelled off by around a sample size of 40-50.
- It was optimal to use 69 trees, input the median, and not scale the data.
- The four most important features were fastQuads, Runs, Snow Making_ac, and vertical_drop.

Modeling Results and Analysis

In conclusion, we decided to go with the Random forest model (sklearn's RandomForestRegressor).

It has a lower cross-validation mean absolute error by almost $1 and exhibits less variability. Verifying performance on the test set produces performance consistent with the cross-validation results.

Modeling Results and Analysis

Strategy

Surprisingly enough, there did not seem to be a clear correlation or pattern between state and the statewide average of our target feature, the 'AdultWeekend' ticket price.

Because there are a lot of features that may lead to business insights and no distinct pattern pertaining to ticket prices, it makes sense to treat all states equally and build a pricing model that considers all states together.

For the modeling we only wanted to use numeric data but also didn’t want to lose track of the state labels (to decipher feature patterns between states and competition internally in states), so we set ‘state’ as the index. We then scaled our original features (to zero mean and unit variance).

Summary and Conclusion

The additional operating cost of the new chair lift is $1,540,000 dollars, but per ticket it is less than $1. The other options entail a ticket price increase of $1.99 dollars and would increase revenue by $3,474,638.

I would recommend scenarios 1 and 2. Scenario 1 if they are losing money keeping these runs open (what is the operating costs). Scenario 2 because their is an increase in revenue, and not a big hike on ticket sales, this would compensate for the additional operating cost of the new chair lift.

The other scenarios are costly and make no change in revenue or ticket price than doing Scenario 2.