Guided Capstone Presentation

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Problem Identification

- Big Mountain Resort (BMR) currently charges a premium above market price for tickets.

- BMR's current pricing is not informed by data on their services/amenities offered. In other words BMR does not know whether their ticket price is justified.

- This is an issue for two reasons:
  - If their price is too high relative to the services/amenities at their facility they could be alienating customers and thus losing revenue.
  - If their price is too low relative to the services/amenities at their facility they could be charging a higher price while retaining the number of customers they currently have.

Problem Identification (cont.)

- BMR's new Data Science team can solve this by examining data on other ski resort prices and amenities in the market

- Through modeling our team will suggest a price for BMR's ticket and compare against current price

- Our team will examine options suggested by BMR and determine their validity as methods for cutting costs and increasing revenue

Recommendation and Key Findings

- **Recommended ticket price: $95.87**
  Current ticket price: $81.00

- Our model shows that BMR is significantly undercharging on ticket price by almost $15 per ticket based on BMR's currently offered services and amenities

- Of the scenarios proposed by BMR, **scenario 2** was shown to be the best. This would involve adding a run, increasing the vertical drop by 150 feet, and installing a new chairlift.
- Employing this strategy would correspond to a ticket price increase of **$1.99**

- The other three scenarios proposed can not be recommended.

Modeling Results and Analysis

- First step in the analysis was visualizing the relationship between ticket price and the other variables for each resort

- Through our heatmap we see that our target variable AdultWeekend (price), had correlations with a few variables: fastQuads, Runs, total_chairs, and Snow Making_ac.

- fastQuads is the number of fast four person chair lifts, Runs is the total number of runs, total_chairs is the total number of chairs, and Snow Making_ac is the total area covered by snow making machines in acres.
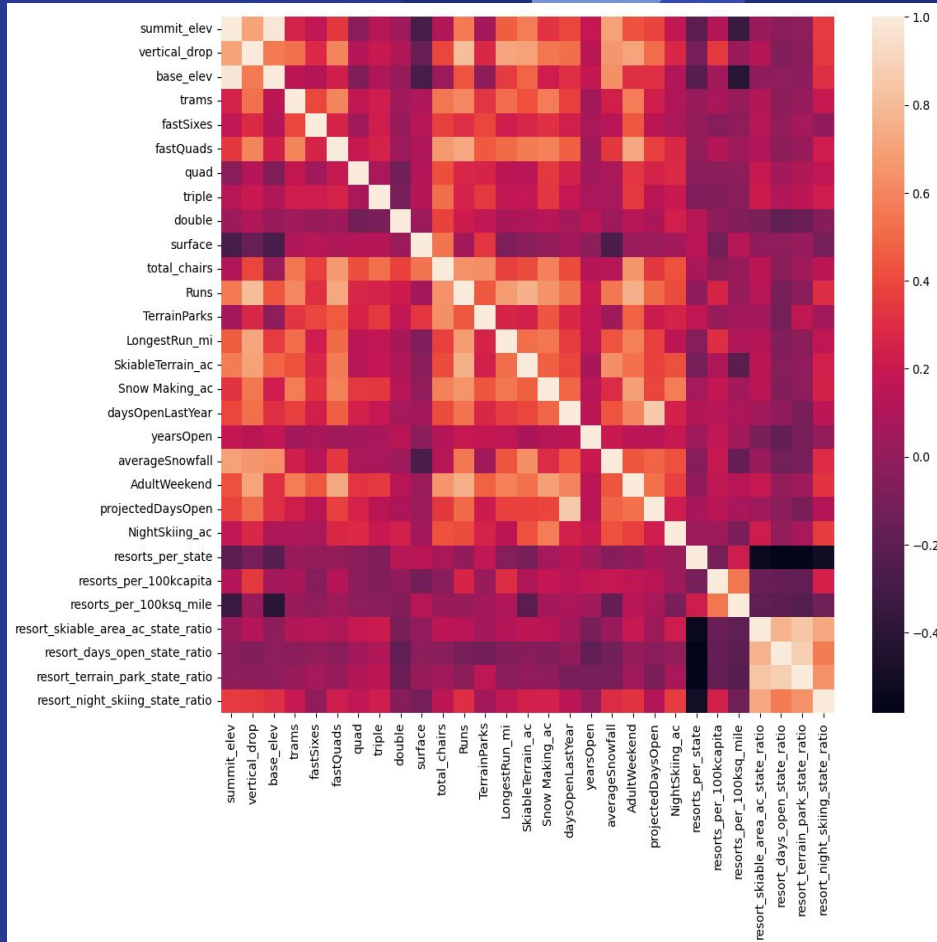
Modeling Results and Analysis (cont.)

- Our analysis involved splitting our data into a training set and a test set, to have data to compare our model to
- We first tested the mean as a baseline performance check. As expected we found that the mean accounted for very little of the variability in our data
- We built and tested two models:
  - A linear model
  - A random forest regressor model
- Both models were inside a pipeline that imputed missing values, scaled each feature, and employed the model.
- The linear model involved a feature selection tool called SelectKBest

Modeling Results and Analysis

- To evaluate the models we used a technique called Cross Validation
    - In Cross Validation, we divide our data set into different folds. We run our model on all but one of the folds and save the other fold as a test set. We then repeat the process using a different one of our folds as a test set each time.
- This confirmed what we saw on our heatmap. Our four best features to use were vertical_drop, Snow Making_ac, total_chairs, and fast Quads. In other words these four are our strongest predictors of price.
- Evaluating both our linear model and our random forest regressor model showed that our random forest model had lower error and variability and thus is our best model for moving forwards
- **This model predicted BMR's price should be $95.87**
- **This model predicted that scenario 2 was the best option and that it would justify BMR increasing ticket price by an additional $1.99**

Summary and Conclusion

- Big Mountain Resort has been undervaluing their ticket prices. They should charge $95.87 for a ticket instead of the $81 that they currently charge.
- BMR could increase their ticket price by $1.99 by adding a run, increasing vertical drop by 150 feet, and adding a chair lift.