Big Mountain Resort:
Pricing Model

Alice Yue

Problem Identification

- Concern that BM is not capitalizing on its facilities
  - Determine an accurate pricing model based on comparable resorts
  - Goal is to increase profits by 10% this season
  - Need to investigate how certain variables relate to pricing in comparable resorts
  - Either cut costs or invest in new/improved facilities

Problem Identification

- Problem can be resolved in one of two ways:
  - Remove facilities that do not contribute to ticket value, thereby reducing operating costs
  - Add or improve facilities to justify a higher ticket price
- Evaluate data to determine which facilities/features have the greatest impact on ticket price
  - Data is missing information on visitor numbers
  - Cannot account for the effect any of the given action options may have on visitor numbers and ticket sales

Recommendations

- Modeled adult weekend ticket value is **$95.87** (nearly $15 more than current price)
- Of the 4 suggested action options, these are the best:
  - **Closing runs**: Closing 1 run will not impact ticket value. Beyond that, our model predicts a drop in revenue after 2 runs closed. Anywhere between 3-5 runs closed produces another drop in revenue.
    - Missing data on visitor numbers; this solution should be executed in increments and evaluated at each step for effect on visitor numbers
  - **Adding a run, increasing vertical drop, installing new chairlift:** Supports an increase in ticket price (by $1.99) leading to an additional $3.5M in revenue over the course of the season
    - Again, as we are missing data on visitor numbers, the model does not account for how that may be impacted by these changes

Data Analysis

- Missing information on state area and populations, so this data was imported from Wiki and merged into the existing dataset
- PCA to check for patterns that might lead to certain data being excluded; no clear patterns, but PCA indicated that ticket prices were strongly correlated with resort density and state populations
- Overall strongest correlations were with vertical drop, no. of fast quads, runs, chairlifts, and population

Model Overview

- Final model: Random forest regression using k best features (k determined by cross validation)
- Built a pipeline to impute missing values, scale the data, select k best features, and train the model
- Tested linear regression as well but random forest exhibited less variability and a lower MAE

Summary & Conclusion

- 2 of the 4 suggested action options are viable: Option 2 (adding a run, increasing vertical drop, installing a new chairlift) seems to be the safer choice (in the absence of information on installation/operating costs)
- Current model can be improved by adding data on operating costs and visitor numbers
- Even if no changes are made, Big Mountain is currently undervalued and should raise ticket prices by at least $5