Guided Capstone Project Report - Ticket Pricing at Big Mountain Resort

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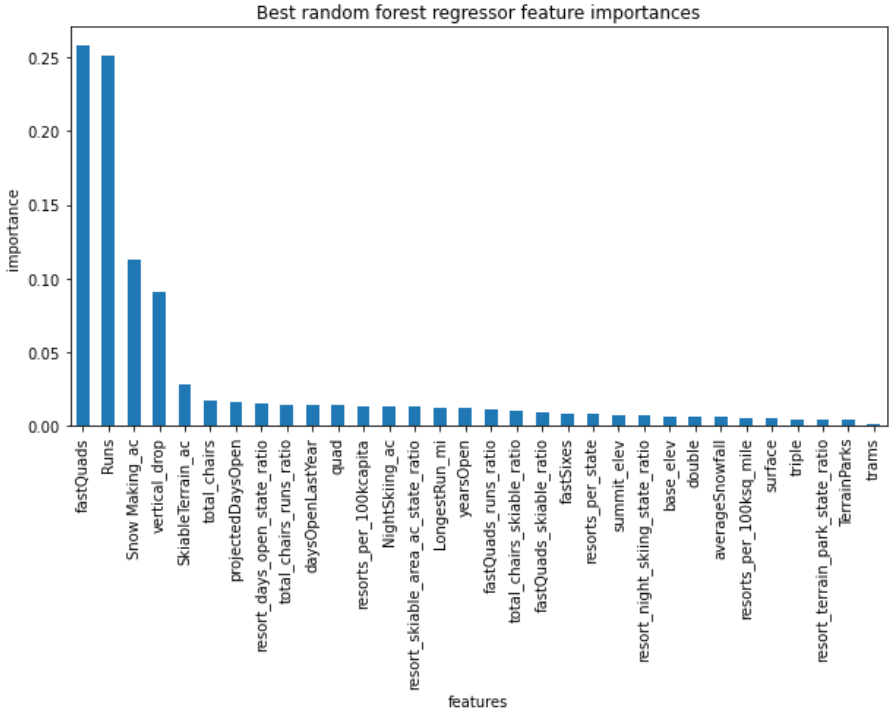
The premium ticket pricing structure at Big Mountain Resort is under review to ensure the ticket price is optimized based on the features at the resort relative to others in the market segment. The business is interested in establishing which facilities drive the most value to the consumer as consideration for future investments, supporting a higher ticket price or highlighting opportunities for operating cost reductions for increased profitability. Using data from ski resorts across the US outlining the pricing, facilities and location details of others in the market segment, how can Big Mountain Resort leverage their existing resort features to support their premium ticket pricing strategy, offset the new $1.54M annual chair lift operating costs, and drive better value to their customers?

In addition to the original ski resort data, additional data was pulled for state level information on population and area. Through the process of Data Wrangling and Exploratory Data Analysis, these data sets were cleaned, and the target feature for optimization identified as the ticket price for an Adult Weekend pass. In this early analysis, no strong ticket price patterns were found when resorts were grouped by states, so each resort was treated individually in the subsequent modelling. During Preprocessing and Training using a random forest regression model, seen in Figure 1, the following features were identified as having the highest impact on ticket pricing - number of fast quads, acres of snow making, number of runs, and vertical drop. A linear model was also considered but the random forest regression model was chosen for its lower cross-validation error and variability.

Figure 1 - Importance of available features based on random forest regression model.



The following list of strategies from the business were considered during the Final Modelling phase to evaluate the best scenario and associated ticket pricing:

1. Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.
2. Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage
3. Same as number 2, but adding 2 acres of snow making cover
4. Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

Based on the modelling, the recommendation is to proceed with Scenario 2. This recommendation supports a ticket price of $82.99, a $1.99 increase from the existing structure. This approach increases annual revenue by an estimated $3.47M based on a season with 350,000 visitors that ski for an average of 5 days. With this revenue increase, the resort can afford the total $3.08M in new chair lift operating expenses; $1.54M for the original new chair lift and assumed $1.54M to add another chair lift supporting the vertical drop increase.

Scenario 3 had no additional impact on the ticket price value over Scenario 2, but would have increased operational expenses. Scenario 4 had no impact on the existing $81 pass value.

Additional exploration into Scenario 1 could be an opportunity for future ticket price optimization. Shown in Figure 2, the modelling indicated that closing 5 runs would have the same impact to the ticket value that closing 3 runs would. Big Mountain already has a high number of runs compared to the rest of the market segment, and evaluating which runs are least valued by customers could inform potential run closures, resulting in a further reduction of operating costs.

Figure 2 - Impact of run closures on ticket price and revenue.