Pricing Model for Big Mountain Resort Tickets in Market Segment

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Nov. 2023

Opportunity

Big Mountain Resort's new chair lift raised this season's operating costs by $1.54 million. The business is unsure if it's maximizing returns relative to its market position and is uncertain about the most valuable facilities to visitors. To address these concerns and cover the new chairlift cost, a data-driven pricing model based on national ski resort data is needed for competitive and customer-centric pricing aligned with market trends.

Data Wrangling

To address missing data, 14% of rows without 'AdultWeekend' and 'AdultWeekday' price information were removed. 'AdultWeekend' was selected as the target price for analysis due to its slightly lower number of missing values. The 'fastEight' column was removed entirely because it had 50% missing values.

Exploratory Data Analysis

PCA revealed eight features with medium to strong positive correlations to the Adult Weekend ticket price, notably 'vertical_drop,' 'fastQuads,' 'Runs,' and 'total_chairs,' as shown in Figure 1.

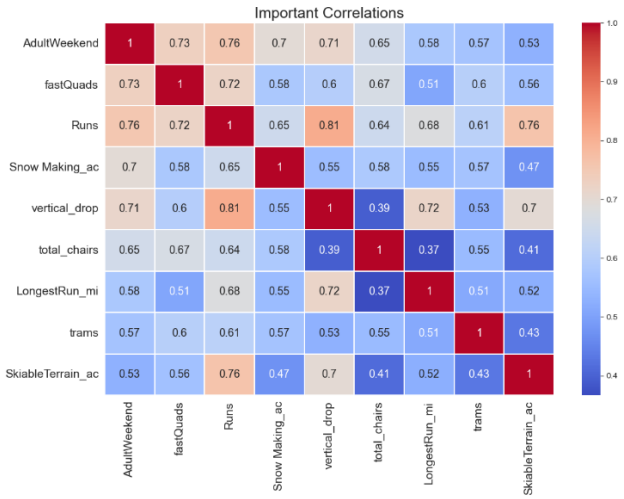

Figure 1: Correlation Heatmap

Pre-Processing and Training Data

A data pipeline was created using median imputation for null values. GridSearch cross-validation with a 5-fold training set partition was applied. Both the Linear Regression and Random Forest models were tested. The Linear Regression model yielded a mean absolute error of $11.79, while the Random Forest model achieved $9.53. Therefore, the Random Forest model was selected due to its significantly lower cross-validation mean absolute error, nearly **$2** less than the Linear model. The top four influential features in both models were 'vertical_drop,' 'Snow Making_ac,' 'fastQuads,' and 'Runs (Figure 2).'

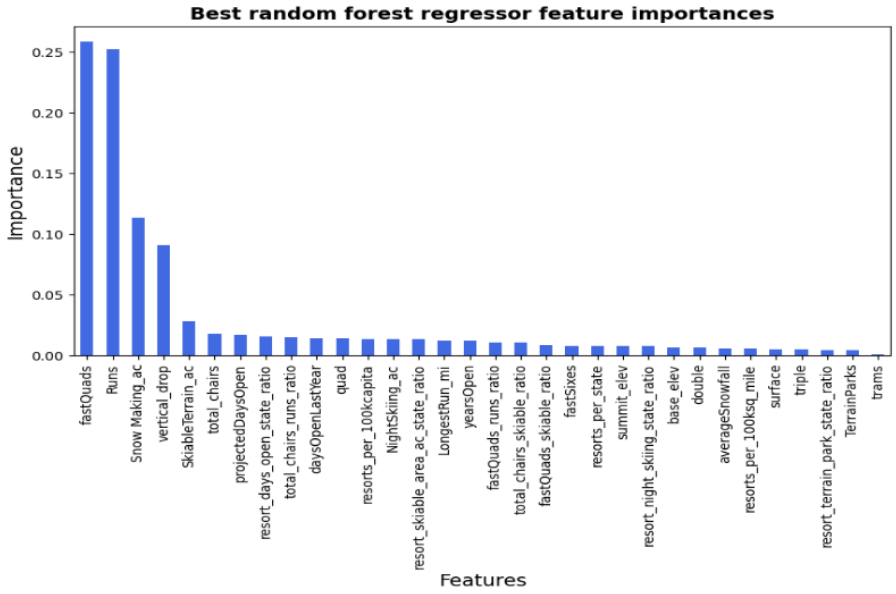

Figure 2: Best random forest regressor feature importance

Modeling and Recommendations

Big Mountain Resort's current price of $81 falls within the middle of the national price range for ski resorts. Figure 3 (a-d) highlights four crucial features selected by the Random Forest model. Among the eight vital factors for ticket pricing, Big Mountain excels in seven categories, with 'trams' being the exception, a feature uncommon am ong most resorts. The expected modeled price for Big Mountain Resort is $95.87 with a mean absolute error of $10.3 9, suggesting a potential **$4.48** price increase.

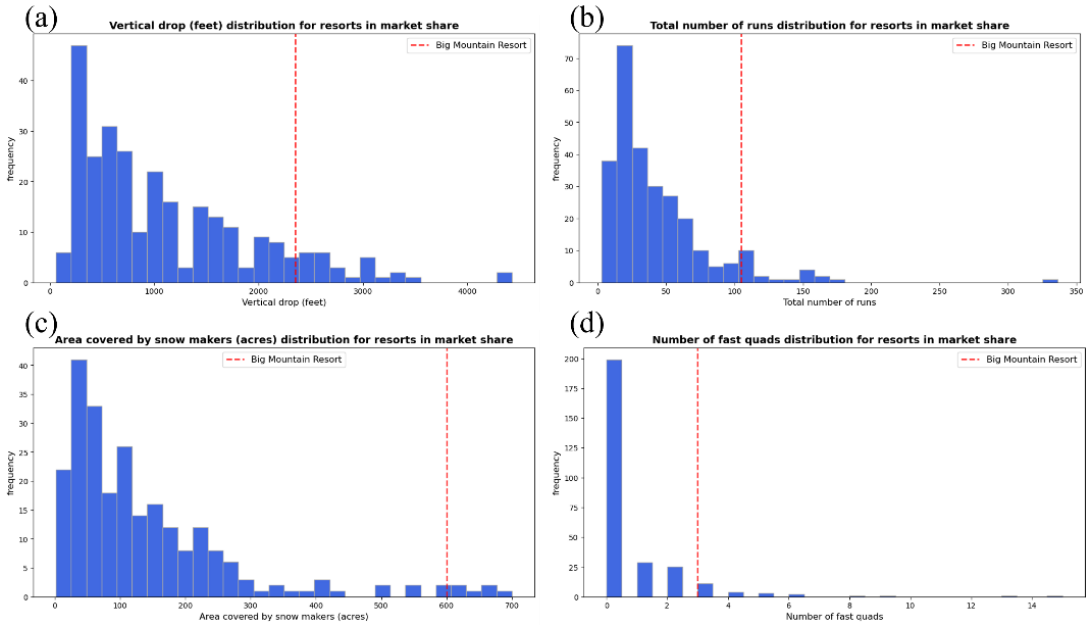

Figure 3: (a-d) Shows the current position of Big Mountain considering the four important features

Also, in consideration of the four different scenarios to reduce costs or increase revenue from BI, two recommendations are supported by our analysis:

1. Consider temporarily closing 3 to 5 runs. This strategy could reduce expenses without a substantial drop in revenue, Figure 4(a, b).
2. Improve the guest experience by increasing the vertical drop, adding a new run, positioning it 150 feet lower, and installing an additional chairlift for skiers' convenience. This adjustment has the potential to support a ticket price increase of $1.99, resulting in approximately $3.48 million in additional seasonal revenue.

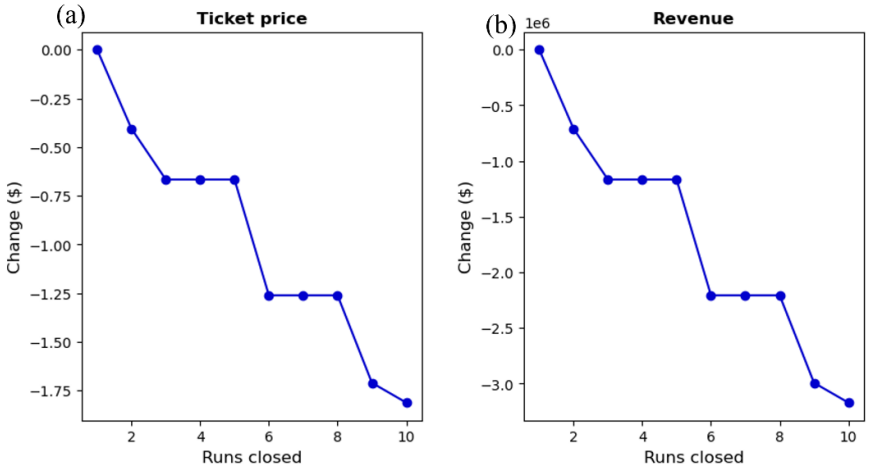

Figure 4: (a,b) Impact of Various Run Closures on Big Mountain Resort's Revenue

Conclusion

Big Mountain has the infrastructure to raise ticket prices, maintaining competitiveness in the resort market. Our recommendations:

Ticket Price Increase: Raise the ticket price by $4.48 (from $81) for an estimated $7.8 million in additional revenue, covering chair lift expenses and contributing $6.3 million annually. Consider an additional $1.99 increase for added value.

Run Closures: Temporarily close 3 to 5 runs with limited impact on revenue.

Enhance Guest Experience: Improve the vertical drop, add a new run, position it 150 feet lower, and install an additional chairlift for skiers' convenience. This may support a $1.99 ticket price increase, resulting in $3.48 million in seasonal revenue.

Future Work

Analyze detailed operating costs of all the facilities to inform decisions on facility closures and cost-effective investments.

Examine why Big Mountain's ticket prices are lower than model suggestions to identify potential pricing optimization opportunities.