Guided Capstone

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Problem Statement

How can Big Mountain Resort optimize facility utilization and increase revenue and profitability by 10% or $1 million in the next ski season by identifying a better value for their ticket price, reducing costs without undermining the ticket price, or supporting an even higher ticket price?

What data-driven pricing strategy can the resort implement that considers factors such as historical data, available facilities and competitor pricing to achieve these goals?

Recommendation and Key Findings

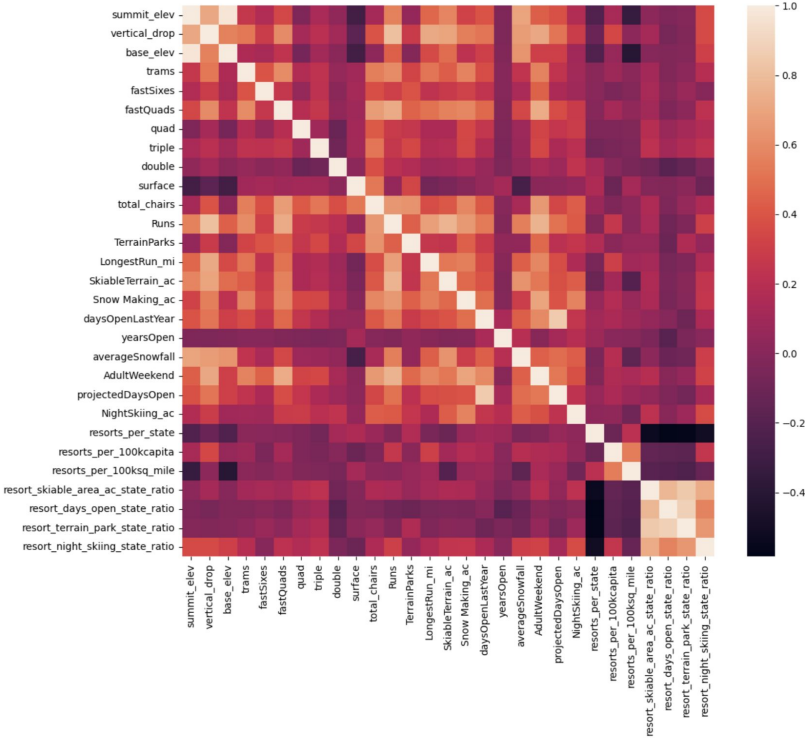
- Our analysis provides insights into the competitive landscape of ski resorts in the United States and pricing recommendations for Big Mountain Resort.
- Future research could incorporate more data on customer demographics and preferences, conduct market research, and analyze the impact of external factors on ticket prices.
- Data-driven decision-making and advanced analytics can provide a competitive advantage in the market.
- Ski resort managers and other business leaders can benefit from data-driven decision-making and using advanced analytics and machine learning techniques to optimize pricing strategies and improve business outcomes.

Modeling results and Analysis

- Imputing missing values using either the mean or median did not significantly affect the results.
- Careful evaluation of each feature's relevance and importance was conducted to avoid overfitting and select only the most informative features.
- Ratio features introduced in the data preprocessing step have created multicollinearity and negatively correlated with the number of resorts in each state.

Modeling results and Analysis

- AdultWeekend ticket price shows reasonable correlations with features such as fastQuads, Runs, Snow Making_ac, and resort_night_skiing_state_ratio.
- Total_chairs is also well correlated with ticket price, which makes sense as more runs require more chairs.
- Total skiable terrain area is not as useful as the area with snow making for ticket price correlation.



High level view of relationships amongst the features.

Modeling results and Analysis

- Random forest regressor outperformed linear regression model in cross validation with lower MAE and standard deviation.
- Test set results were consistent with cross validation, with a mean absolute error of ~9.53 compared to ~9.64 for cross validation, within one standard deviation.
- Therefore, we will use random forest regressor model going forward as it consistently produces lower MAE and has significant business impact, with no major disadvantage due to small dataset size.

Summary and Conclusion

- Market supports a ticket price of around $95-$100 for Big Mountain's facilities, with no significant changes in features affecting ticket prices.
- Conduct surveys or analyze customer feedback to gauge the impact of run closures on customer satisfaction and revenue. Consider a gradual approach and transparent communication to minimize negative impact.
- Additional cost data on labor, maintenance, and energy costs would be useful for future modeling. The model could also be refined by incorporating more detailed information on competition and customer demand.
- Data-driven decision-making and advanced analytics can provide a competitive advantage in the market and drive growth for ski resorts.