**Big Mountain Resort Price Modeling Report**

Big Mountain Resort has been questioning whether its current lift ticket price of $81.00 is optimal. With the recent addition of a new lift, which has increased operating costs by over $1.5 million, we want to ensure that our pricing is both competitive and sufficient to cover these additional costs, while maximizing revenue. Given that our ticket price was originally set without a clear data-driven strategy, this analysis aims to determine if an increase is warranted and, if so, to identify the right price point.

To tackle this, we gathered data from over 330 ski resorts across the country. This dataset included ticket prices, as well as various features such as resort size, number of runs, vertical drop, snowmaking acreage, the presence of trams, and other relevant factors that could influence ticket pricing. The goal was to understand how these features correlate with pricing and to identify trends that could inform Big Mountain’s pricing strategy.

A Seaborn Heatmap (Fig 1) was used to see if and how various features were correlated. After reviewing the data, observed some trends possibly indicating room for a price adjustment. Features such fast quads, vertical drop, and Snow making acres all seem to be connected to price. We wanted to dig deeper using a more analytical approach. To do this, we developed two predictive models: a linear regression model and a random forest regression model. We trained both models using the a 70/30 split of the data and tested their performance. Ultimately, the random forest model performed better with a lower MAE, showing stronger accuracy and a more robust ability to predict the optimal ticket price.

Using the random forest model, we found that the optimal ticket price for Big Mountain is approximately $95.87, representing an increase of over $14.00 from the current price. This price point is supported by the features the RF model found to be most impactful, snow making acreage, vertical drop, fast quads and runs (Fig 2) all of which position Big Mountain among the higher tier of ski resorts (Figs 3, 4, 5, 6). Given the operating cost increase associated with the new lift, this price increase would cover the additional $1.5 million in costs, while also generating significant additional revenue.

We also ran several scenarios through the model to assess the potential impact of future changes to the resort. For example, adding a new run, lift, and an extra 150 feet of vertical drop would support an additional $1.99 price increase, generating an extra $3.47 million in revenue. On the flip side, we examined the impact of closing runs. The model suggests that closing one run would have no impact on revenue or ticket price. However, closing two or three runs would reduce the ability to support higher ticket prices, with a more substantial impact if more than three runs are closed.

The model’s predictions were limited by a lack of comprehensive cost data, such as detailed information on maintenance, staffing, and other operational expenses, which would have provided a more accurate pricing estimate. Additionally, visitor data and broader market factors weren’t fully integrated, which could have influenced the model’s assumptions about pricing. The higher predicted price for Big Mountain is likely a result of the model placing significant weight on the resort's facilities, without factoring in the real-world costs of running the resort or external market conditions. This could potentially surprise business executives, so a deeper, more granular cost and market analysis would be necessary to refine the model's predictions and provide a clearer understanding of the price impact.

To make the model more accessible for future use, it would be beneficial to develop a tool that allows business analysts to easily adjust key parameters and test different pricing scenarios on their own. This would reduce the need for constant technical support, enabling quicker decision-making and allowing the model to be updated as more data becomes available. Moving forward, incorporating more detailed cost information and refining the model to account for market dynamics will be crucial for ensuring that the pricing strategy aligns with both operational realities and industry trends.

Figure 1

A close-up of a grid

Description automatically generated

Figure 2A graph with blue and white text

Description automatically generated

Figure 2A graph with a red line

Description automatically generated

Figure 3A graph of a vertical drop

Description automatically generated  
Figure 4A graph of snow making

Description automatically generated

Figure 5A graph of a number of land area

Description automatically generated with medium confidence