Guided Capstone Project Report

Problem Overview:

Big Mountain Resort is a ski resort in Montana that offers unique views of Glacier National Park and Flathead National Forest. Management's pricing strategy already assumes a premium above the average price for regional alternatives. Still, management believes that Big Mountain Resort is not fully capitalizing on the true value of the Resort's facilities and offerings. Furthermore, the resort has just committed to adding a new chair which would increase operating costs by $1,540,000. Management has asked us to find a ticket price for which profit from attendance will cover the additional operational costs and answer management's questions about capitalizing on the Resort's full value. Additionally, management has asked us to investigate the revenue and ticket price outlook for closing ten of the least used runs.

Analysis:

To understand how well Big Mountain Resort has been capitalizing on its facilities relative to its regional peers and predict a sustainable price increase, we used machine learning models with regional and national data to rank the facility features by their ability to predict a price increase. We used linear regression and random forest models, which produced vertical drop, snowmaking accrued, total chairs, number of fast quads, runs, longest run-in miles, and skiable terrain accrued as facility features correlated with a price increase. Due to our current commitment to increased operating costs for a new chair lift running through scenarios in which we would incur additional costs for new fast quads was not an option. Furthermore, skiable terrain accrued was the most significant negatively correlated feature in the linear regression model, so while interesting, it was not part of our preliminary assessment. We modeled scenarios that used increased feature values for the vertical drop, snowmaking accrued, total chairs, runs, and longest run-in miles with a predicted ticket price increase as an output for the model. The combination with the least amount of feature value modifications and the largest ticket price increase was adding one run, increasing the vertical drop by 150 feet, and installing an additional chair lift. These facility modifications resulted in a modeled ticket price increase of $1.99. Attendance for the upcoming season is expected to total 350,000 visitors. We hope each visitor buys five tickets, resulting in a revenue gain of $9.95 per customer or a net revenue gain of $3,482,500.

Regarding management's inquiry about closing runs, the model forecasted that closing one run would make no difference in the ticket price and revenue outlook. However, closing the subsequent two and three least-used runs would reduce support in the overall outlook for a ticket price and revenue change. Closing all ten runs would reduce the ticket price increase by $1.75.

Recommendation:

If attendance estimates are met, the profit, excluding the fixed costs for adding an additional run and increasing the vertical drop by 150 feet, would be the expected net revenue gain of $3,482,000 minus the increased operational costs for the new chair of $1,540,00, resulting in $1,942,500 of profit. Due to this profit outlook, we recommend that management incur the additional fixed costs for adding one run and increasing the vertical drop by 150 feet. In turn, it raises its ticket price by $1.99. Additionally, given that this scenario includes adding a run to its total count, we can't recommend closing any of the least used current operational runs to management.