GUIDED CAPSTONE PROJECT REPORT: Big Mountain Resort

Big Mountain Resort acquired an additional chair lift. The operational cost is approximately $1.56m, which excluded other additional costs of running day to day to year activities to keep the resort in good business. Although it is among the hierarchies of resorts in Montana and the Region that relatively charges high ticket prices ($81.00), Big Mountain Resort is still trying to get out of the financial wood. With its current ticket price, cost of operating additional chair lift, snowmaking area, energy cost, maintenance repair, and upkeep expenses; Big Mountain Resort would most likely run into deficit at the end of every fiscal year.

To nip in the bud this looming financial disaster from befalling the resort, a model was designed based on the company's facilities and the prevailing market demand, and what other competitor resorts were offering that do sustain them in the resort business. We present the main option model that gives a model ticket price of $95.87 with an expected mean absolute error of $10.39, which indicates an opportunity for a ticket price hike for the Big Mountain Resort. This Random Forest model requires closing up 10 of the least used runs, which impacted both the predicted ticket price and associated predicted revenue on the assumption that each expected visitor purchases 5 tickets. Only closing 2 and 3 runs cause reduced support for ticket price and revenue. Also, closing up to 6 or more runs drives a large drop in both ticket and revenue.

Next, we simulated the four facilities (Runs, Vertical_drop, Total chairs, Snowmaking_ac) of the Big Mountain. These features were 1, 150, 1, 2 respectively, and on assumptions that each visitor would purchase 5 tickets. The performance increases support for ticket price by $1.99 and would generate an expected amount of $3,474,638 in revenue over the season. Further addition of snowmaking area would give the same result as stated above. No difference whatsoever was

observed when we considered LongestRun_mi by 0.2 miles and snowmaking area by 4 acres of snowmaking capability.

However, when we simulated the five facilities or features together, that is, Runs, Vertical_drop, Total chairs, Snowmaking areas, and LongestRun_mi by 1, 200, 1, 2, 0.1 respectively. It demonstrated increase support for ticket price by $4.04 and an expected revenue amount of $5, 661,072 on assumption that each visitor buys 4 tickets. If each visitor pays for 3 tickets the revenue becomes $4, 245, 804 and for 5 tickets purchases per visitor would generate an expected revenue of $7, 07,341. What the results tell us is that increasing the Vertical_drop and the number of ticket purchases per visitor would bring a tremendous change in both the ticket price support increase and expected revenue over the season.

As we can see from the above model, Big Mountain can afford to bear the cost of operation of the additional chair lift and other cost-effective energy, maintenance repair, and even snowmaking acres. After these expenditures, Big Mountain Resort can declare surplus profit for every fiscal year, which is the objective of constructing a data-based model from Sklearn’s Random Forest.