**Guided Capstone Project Report**

Written By: Nan Zhou

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**My recommendation:** To increase the adult ticket price **$1** from its current **$81** to **$82**. Based on 350,000 expected visitors per season, and on average, five days per visitor would ski for, the one dollar ticket price increase would add extra **$1,750,000** revenue per season, which would cover the extra **$1,540,000** operating costs for a newly installed chair lift.

**Predicted price**: Based on the model built from the dataset provided by DB manager, the predicted ticket price that Big Mountain resort’s facilities support for is **$95.87** with **$10.39** mean absolute error. If we consider the **$10.39** error into the predicted price, the price of **$85.48** is still above the current price **$81**.

**Selected Model and Features:** The selected features used in the mode contains 21 natural properties and hardware facilities of each resort and 11 ratio features with 7 to the value of the state that the resort is in. The random forest model is picked based on better performance with low variability compared with linear regression model. It is worth noting that the model is built on a dataset with total 277 resorts nationwide, in other words, the predicted price generated by the model is supported based on the analysis on all selected features in the **national** market place.

**Current position**: Based on the dataset provided from DB manager, across 277 resorts nationwide, the current ticket price of **$81** is above the national average **$63.8** (without considering the Big Mountain itself) and is also above 80 percent of resorts in the dataset. Within the state of Montana, the price of **$81** is ranked as top 1 among 11 resorts, and state’s average price of Montana is **$49** (without considering the Big Mountain itself). The situation the Big Mountain resort is facing is that it is already in the leading position of price in the state of Montana, however, the model suggests there is still **$4** increase that could be supported in the marketplace by Big Mountains’ facilities.

**Dependency**: My recommendation is based on the model’s prediction with some reservation. As I believe a ticket pricing strategy is significantly dependent on the consumer analysis as well. Whether our majority of visitors are local or out of state could be another factor that will play a role here. Actually, my recommendation is to conduct a customer analysis before we could decide on how to use the model created here.

**Other options:** Below are some differences on some options the business provided predicted by the mode.

1. Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.

Currently Big Mountain has 105 runs. Based on the model, closing one run makes no difference, closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes down 3 runs, it seems they may as well close down 4 or 5 as there's no further loss in ticket price. Increasing the closures down to 6 or more leads to a large drop. (See chart below). Without knowing the operation cost of each run, it is hard to say if the revenue reduce could be covered by the operation saving on each level. However, based on the model result, suggesting number of run to close are 1 or 5 or 8.

1. Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage
2. Same as number 2, but adding 2 acres of snow making cover

Option 2 and 3, both are supported by the model for **$1.99** increases on ticket price, and **$3,474,638** expected extra revenue. Currently Big Mountain is the one that already have the most snow making area in the state of Montana, and also on the high end across the nation. Comparing with 600 acres of existing snow making area, 2 acres is about 0.3%, which really make no big difference. Without knowing the actual operation cost of snow making, we could still say with less investment option 2 could bring same amount of revenue increase as option3.

1. Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

The last option doesn’t produce any difference on price based on the model since the longest run is way down in the feature importance list from the model. Current 3.2 longest run is already the longest in the state of Montana, whether 3.5 longest run would attract more visitors is up to further analyzing by marketing team. It’s worth noting that all our calculation is based on 350,000 visitors per season and 5 days tickets per visitor. Given that, the investment on option 4 would not be able to bring any immediate revenue increase.

