Background

Big Mountain Resort's pricing strategy has been to charge a premium above the average price of resorts in its market segment based on market average. To take advantage of other data, such as the relative importance of the various features provided, the aim is to determine best ticket pricing and investment strategy to increase profits. Specifically, the question is: how can Big Mountain Resort increase their profit by 10% within the year by a combination of cutting costs and determining the best ticket price they can get by using their features in the way that best matches with customer interests?

Discoveries

Based on the data examined, it appears that Big Mountain Resort is in a good position to increase profits. This is because:

1. The model indicates that Big Mountain charges one of the highest ticket prices among the 330 resorts examined. Even so, the model indicates that, with no change in features, there is room to increase the ticket price up to $4.50 more than the current ticket price of $81.

2. The model indicates that the increase in price that would be acceptable to the current set of visitors would more than cover the price operating cost of the new chair lift ($1.54 million operating costs = $0.88 per ticket for the current approximate 1.75 million tickets sold per year based on the estimated 350,000 guests buying 5 tickets each).

3. The model was developed upon discovery of which features appear to have most impact on ticket price, but only a few scenarios were explored. If the model proves fruitful, it could further be used to evaluate and make changes in features that could lead to higher ticket prices or lower operating costs that would increase profits even more.

4. The model was also used to pursue the idea of closing runs to reduce costs. The model suggests that closing one run would not affect accepted ticket price. It also suggests that if 3 runs are closed, then closing 4 or 5 would have no further effect on accepted ticket price so, if desired, further savings could be obtained.

Basis

The model that led to these discoveries were picked by doing some initial analysis on the data.
Location information was looked at to determine if it was more fruitful to look at Montana resorts only or all 330 resorts across the United States. Since Big Mountain Resort had the highest priced tickets among Montana resorts and Montana, overall, was in the lowest tier of ticket prices among the states, a comparison to other Montana resorts alone appeared to be of limited use.

The analysis of feature data also determined that the following features appeared to have the most impact on ticket price: "number of fast quads", "number of runs", "snow making acreage", "vertical drop", and "total chairs".

From there, several models were examined. The one the proved to be most robust was the random forest with because its cross-validation had a Mean Absolute Error (MAE) mean of about $9.64, which was better than the linear regression's $10.50. The MAE standard deviation of the random forest cross-validation was

1.35 vs. 1.62 for the linear regression, making it less variable and thus more likely to be accurate in further tests.

Scenarios
(Four scenarios were presented for the model to examine).

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

   The model says closing one run makes no difference. Closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes 3 runs, it seems they may as well close 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.

2. 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.

   This scenario increases support for the ticket price by approximately $1.99 (presumably above the approximately $4.50 room for increase for no feature changes). Based on the assumption of 350,000 visitors buying 5 tickets each, the revenue from this increase alone is $3,474,638.

3. Same as number 2, except adding 2 acres of snow making cover.

   The model showed results that were the same as for number 2, so adding that much snow making made no difference.

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

   This model also showed results that were the same as for numbers 2 and 3, so those additions also made no difference. Note that the model chosen did not have “longest run” as a particularly high importance feature and the snow making of 2 acres did not make a difference, so this result is not very surprising.

Conclusions

Based on the given data and the model created based on that data, there is room for increased ticket price. If the model is accurate, a $4.50 increase is a safe one and that alone, based on the estimated 350,000 visitors buying 5 tickets each, would increase revenue by 5.5% ($141.75 million at current $81 per ticket vs. $149.625 million at raised $85.50 ticket price).

The model showed how a further ticket price increase could occur with a 150 foot extension of the vertical drop and an additional run and chair lift. The model also showed how runs could be decreased, if necessary, to save costs. However, there is a lot of information missing to fully figure profits. Also, there are also a lot of other scenarios that could be examined. A dashboard or app could be created to allow further exploration of the model.

Thus, a proposal is to develop an implementation plan that tested out the model, starting with those easiest to implement with the most gain (e.g. increase ticket price with no further change by an amount at least $1 to cover the new chair lift up to $4.50). Then, further model and selectively implement further changes with least risk and most reward and there is most likely a path to a 10% profit increase.