Guided Capstone - Big Mountain Resort

Big Mountain Resort has purchased a new chair lift to increase the distribution of visitors across the mountain. The new chair lift increases the operation cost of Big Mountain Resort by $1.54M. Big Mountain Resort’s Management has expressed the want to find a better investment strategy to cover for the increase in operation cost of $1.54M through operational improvements and/or better ticket pricing. We used a CSV file from Ms. Eisen, Database Manager, that contains metadata about different resorts across the country to find a new investment strategy that is better than the current one that Big Mountain Resort is using.

When looking at the CSV file, we have to ask ourselves a couple of questions before moving on:

* Do we think that with the data, we need to answer the desired question?
  + Have we identified the required target value?
  + Do we have any potentially useful features
* Do we have any fundamental issues with the data?

The target value that we are going to look at in our data is the ‘AdultWeekend’ ticket price to determine what Big Mountain Resort is going to charge its customers. ‘AdultWeekend’ ticket price was used because we have found that the resorts that are in Montana charge the same price for the weekday or weekend ‘AdultWeekend’ also had less missing data, so using ‘AdultWeekend’ ticket price will give a better solution for our problem. We fixed the fundamental issues with the data through data wrangling techniques. We then preprocessed and trained the different models so that we can see which model will be the best for our problem.

The random forest regression model performed better than the linear regression model. We determined this by looking at the mean absolute error (MAE). Mean absolute error just measures the average of the absolute value of the errors. The mean linear model had a MAE of 10.50, while the mean random forest regression model had a MAE of 9.54. The random forest regression model has a lower cross-validation MAE of almost $1. The random forest regression model also had less variability. This makes the random forest regression model to use for this problem.

The random forest regression model predicted that the ticket price for Big Mountain Resort should be $95.87. The current price of tickets for Big Mountain Resort is $81. Even with the MAE of $10.39, there is room for an increase in ticket price. The current Big Mountain Resort pricing strategy is to charge a premium above the average of resorts. This strategy ignores the fact that people are willing to pay more/less depending on certain features. It was found out that vertical drop, snow making area, total chairs, fast quads, total number of runs, longest runs, trams, skiable terrain area were found to be important features that may affect the ticket price.

Big Mountain Resort’s management has shortlisted some options that the business can implement:

1. Permanently close up to 10 of the least used runs

The model says that closing one of the least used runs will make no difference, but closing more than one of the least used runs will hurt the ticket price and the revenue.

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

This will increase the support of the ticket price by $1.99 and increase the revenue by $3474648.

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, but adding 2 acres of snowmaking cover

This will increase the support of the ticket price by $1.99 and increase the revenue by $3474648.

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

The model shows that there will be no increase in price.

This is based on the fact that Big Mountain Resort has an average of 350,000 over the season with opening five days a week.

Big Mountain Resort should include part of option 1 and option 2 in their strategy. Removing the least used run will not hurt the ticket price as well as revenue. Removing the least used run will reduce the operating cost. Increasing the vertical drop by adding a run to a point 150 feet lower down without additional snow making coverage will increase the support of the ticket price by $1.99 and increase the revenue by 3474648. This will help bring in more profit and cover the increase in operation cost.