Casey La Honta

Guided Capstone Project Report

The Big Mountain case study

For this project, I was tasked with evaluating the ticket price for Big Mountain Resort, a ski resort in Montana. Currently, Big Mountain charges $81 for an Adult Weekend Pass. This ski resort attracts about 350,000 guests a year, and is able to accommodate all skill levels and abilities. Big Mountain also added a new chairlift this year in order to better distribute skiers across the resort. While there is an expectation this lift will help to increase ticket sales, it also comes with an operating cost increase of $1.54m annually. Big Mountain currently prices tickets by charging a premium above the market average rather than the size or quality of its facilities, or the number of months per year it is open. In addition to the new chairlift, Big Mountain’s management has also hinted and other changes that could cut costs or justify an increase in ticket price.

An initial data set of 330 ski resorts was used to determine the effect of certain facilities on ticket price. During the data wrangling, 53 of the 330 resorts were removed due to missing ticket prices. There were only two attributes removed. During this phase data entry errors were also located and corrected, and various discrepancies were also resolved. The resulting data set contained information on a number of Big Mountain’s competitors and data regarding the markets in their respective US states. This information, when analyzed against Big Mountain’s ticket price, allowed us to address whether or not Big Mountain charges a ticket price reflective of its facilities.

During the exploratory data analysis, the cleaned up data set was examined for trends influencing ticket price. A PCA suggested that certain factors were responsible for variance in ticket price, suggesting that other resorts did not arbitrarily set ticket prices. The four factors revealed to have the greatest effect on ticket price were the number of fast quads, the height of the vertical drop, the number of chairs, and the number of runs. These four factors provided a good starting point for modelling ticket price.

In the next step, it was determined that a Random Forest Regression model was the best for predicting ticket price. This model proved better than a linear regression model at predicting the price, as having both a lower mean absolute error and less variability. It was also determined that enough data had been collected to evaluate the performance of the model. According to this model, fast quads, vertical drop height, and number of runs were once again shown to account for the most variance, but acreage of snow making machines overtook the number of chairs in this model.

Applying the model to Big Mountain’s price reveals that Big Mountain should be charging $95.87 for an Adult Weekend Pass. Compared to the current price of $81, the model demonstrates that Big Mountain is not capitalizing on its facilities as much as it should be. Even though an Adult Weekend Pass at Big Mountain is less than half the cost of the priciest resort, Big Mountain is near the top of the rankings with a number of features. The highest-demand features include the following:

* Vertical\_drop
* Snow Making\_ac
* total\_chairs
* fastQuads
* Runs
* LongestRun\_mi
* trams
* SkiableTerrain\_ac

Big Mountain ranks at or near the top of the rankings in each of the above features, with one exception (number of trams).

Big Mountain’s leadership also proposed a number of propositions to cut costs or justify ticket price increases. Of these, the only scenario that provided significant changes within our model was Scenario 2. In this scenario, Big Mountain would add a run, increase total vertical drop by 150ft, and add another chair lift. This change would, according to our model, best justify an increase in ticket price.