There is no difference between weekend tickets and weekday tickets for the resort in state of Montana, since there are more missing values for the weekday tickets in the data set, we choose weekend tickets to be our target variable. And we believe the prediction of our model can also be applied to the weekday tickets price.

After analyzing the correlation between features and our target variable, we find there are several features that have impact on the weekend tickets price for adult. The most important features that have impact on the tickets price are the vertical drop of the resort, area covered by snow making machine in acer, total number of chairs, number of fastQuads lifts, total number of runs, the length of the longest run, number of trams, the skiable terrain per acer. All these features have positive impact on the ticket price except number of trams and the skiable terrain per acer. The vertical drop of the resort has the biggest positive impact on the price. The area covered by snow making equipment is a strong positive as well. The skiable terrain area is negatively associated with ticket price. One of the possible reasons could be larger resorts can host more visitors at any one time and so can charge less per ticket. We may need more data such as the total visitor for a season to figure this out.

Currently Big Mountain charge $81 per adult for the weekend ticket. For Big Mountain’s current facilities, it should charge $95.87 for each ticket based on our model prediction. Even with the expected mean absolute error of $10.39, this suggests there is room for an increase. But this prediction in the assumption that other resorts accurately set their prices according to what the market supports. Big Mountain was already fairly high on some of the league charts of facilities offered, but our modeled price is higher than its current price. So, Big Mountain price itself could be underpriced or the market price for other resort in the state are somehow overpriced. We could use our model and the data of other resorts that located in Montana to make prediction on their tickets price and then compare with their current price to check if there is overprice or underprice issue. To make our prediction more robust, we may need more data such as operating costs and total visitors.

Based on our current best model, If Big Mountain install an additional chair lift which also adding a run, increasing the vertical drop by 150 feet, in this scenario, the predicted ticket price can be increase by $1.99 and the seasonal revenue could be expected to increase $3,474,638.

In the future we could test if Big Mountain install a new fastQauds lift chair, how much will the price predicted to increase.

To reduce cost, Big Mountain can choose to shut down some runs. Based on our model, closing one run makes no difference on the ticket price. 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. We might need more data about the current operating cost for each run and the popularity of each run to make decision about which runs to close and how many runs to close to save as much as possible but still have a controllable negative impact on our ticket price.

As I mentioned before, to make the prediction more robust, we might need other data such as operating costs for each run, total visitor for a season, cost of adding a new fastQauds lift chair, and, if possible other resorts’ sales data and operating cost.