**Data Wrangling and EDA:**

Modelling based on dataset with 300 Resorts with information on their State, Region, and numerical variables on features and facilities (Skiable Terrain, Snow Making, Vertical drop, fastSIxes. Longest Run, etc.)

Adult Weekday was dropped, and Adult Weekend chosen as the target variables considering it was the same as Adult Weekend part $100 and that it had more missing values than AdultWeekend. fastEight was also dropped for having its vales being missing or zero. Ambiguous data was dropped, and erroneous data was corrected.

Relatively expensive ticket prices in California, Colorado, and Utah. More variability in Montana and South Dakota. State as a feature was dropped for descriptive features of the state totals (days open, terrain parks, night skiing) and resorts per 100k in population and square mileage and dropped for the derived the ratio of those state features every resort claimed (ex. Alyeska Resort makes up 70% of Alaska’s Ski-able area). These ratio features introduced a lot of multicollinearities to the data, something troublesome for linear regression models.

Ticket price was negatively correlated with the ratio of chairs to runs, possible explained by an exclusivity factor.

**Preprocessing:**

Simply guessing the averages produced a Mean Absolute Error of $19. Cross folded Linear Regressiosn models performed best when looking only at

Trams,total\_chairs,fastQuads,Snow Making\_ac,

SkiableTerrain\_ac,Runs,LongestRun\_mi

Random Forest with 59 estimators inputting the median performed better overall with a Mean Absolute Error of $10.36

**Modeling:**

Modelling priced Big Mountain at $96 give or take $10. Even in the most conservative estimate ($86), Big Mountain’s Adult Weekend Entry is undervalued by $5 at its current $81 price.

The following are breakdowns for potential changes and their impact on ticket price assuming an estimate of 350,000 expected visitors who ski on average 5 days:

**Close down up to 10 of the least used runs:**

Closing one run down makes no difference. Closing 2 or 3 drives down the price by up to 75 cents. Results for shutting down 3-5 runs all effect ticket price the same, with a sharp decrease in shutting down 6 or more runs.

**Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift:**

This scenario supports ticket price by $8.61. expected to generate $15 million in revenue.

**Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift ADDITIONALLY adding 2 acres of snow coverage:**

Adding an additional 2 acres of snow to the previous scenario does not impact ticket price more or less.

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

This scenario supports neither an increase nor decrease in ticket price.

A new chair on its own would support a 29 cent increase in ticket price generating a $500K over the season while the operating costs of the chair are 1.5 million, an .87 cost per person. Raising the ticket price by another 60 cents is advisal since it would lie in the mean standard error. Decreasing the number of runs while increasing the vertical drop provides an increase in ticket price overall while cutting the operating cost of 5 runs.