

Business problem:

Use model prediction to identify higher adult ticket price supported by the US ski market given Big Mountains existing features.

## Secondary goal: Evaluate modification options\* to runs and equipment which would support ticket price increases.

- Permanently closing down up to 10 of the least used 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 to bring skiers back up, without additional snow making coverage.
- 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, *with additional snow making coverage*.
- Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

\*modification list provided to the analysis

**YES, increase ticket prices.** The current adult weekend ticket price charged by Big Mountain is \$81. With no changes to Big Mountain (and including the new run), modeling suggests increasing ticket price. The predicted ticket price is \$95.87 with a mean absolute error of \$10.39

- Permanently **closing down least used runs.**

Closing one run makes no difference.

Closing 2 and 3 successively reduces support for ticket price and so revenue.

**Close down 4 or 5** as there's no further loss in ticket price.

Increasing the closures to 6 or more leads to a large drop.

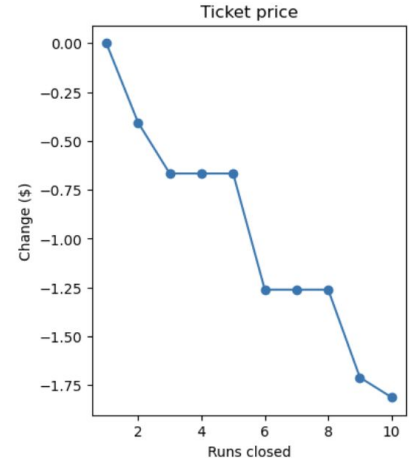
- Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage.

**This scenario increases support for ticket price by \$1.99**

**Over the season, this could be expected to amount to \$3,474,638**

Cost of run expansion and chair lift installation, maintenance, and staffing is not known, but would have to be found and considered. Adding 2 acres of snow making cover to this combination had no effect.

- Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 2 acres. **No difference**

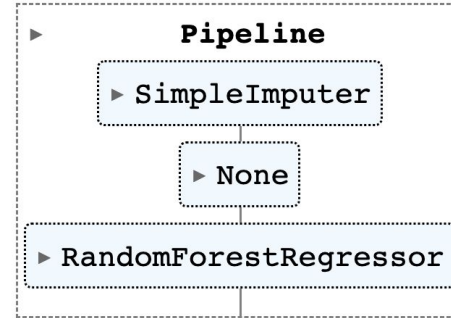


ski\_data dataset: 330 rows and 27 columns

Big Mountain Resort data is present in the dataset and is complete with no missing values  
column 'AdultWeekend' was used as a measure of ticket price

A model was created using industry data on US ski resorts to predict the ticket prices for Big Mountain supported by the market.. The model was trained on 70% of the data available. Final predictions were made using all available data except that of Mountain.

The model was refitted on all available data (excluding Big Mountain).



This model's predictions are dependent on the accuracy of our competitors' pricing, and limited on the data available. No information was available about number of visitors at other resorts, expenses around construction, maintenance, staffing etc.

# Predicting ticket price

The current adult weekend ticket price charged by Big Mountain is \$81. With no changes to Big Mountain (and including the new run), modeling suggests increasing ticket price. The predicted ticket price \$95.87 with a mean absolute error of \$10.39

Current adult ticket price:  
\$81.00

The model predicts, that with no changes, the market will bear an increase.

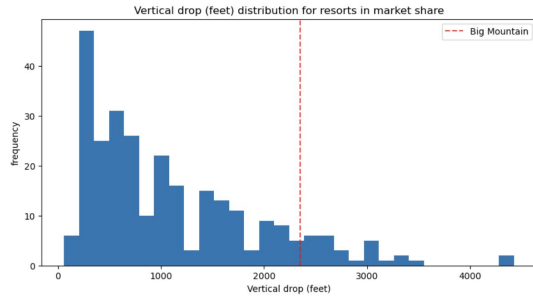
Predicted adult ticket price range:  
\$85.48 – \$106.26

# Identifying important features

The target feature 'AdultWeekend' represents adult ticket prices.

Both a heatmap and a Random Forest regression model identified the important features as “fastQuads, Runs, Snow Making\_ac and vertical\_drop.”

SkiableTerrain\_ac was the next important feature after the first four, but unlike the others, it fell far below .05 in importance and actually had an inverse relationship with ticket sales, perhaps due to unexplored reasons involving total ticket sales.



Big Mountain is doing well for vertical drop, but there are still quite a few resorts with a greater drop.

YES, increase ticket sales

Close down 4-5 least popular runs

Consider Increasing the vertical drop by adding a run to a point 150 feet lower down. No additional snow-making

Run future feature modification concepts through the existing model

Consider tuning hyperparameters

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