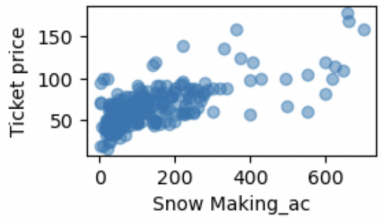
1. Problem Statement:
Big Mountain Resort seeks to enhance its pricing strategy and facility improvements, ensuring optimal profitability while delivering value to its patrons. This report aims to provide data-driven recommendations based on rigorous analysis of existing data.

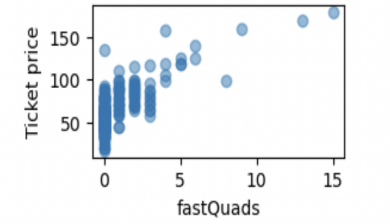
2. Data Wrangling:
The initial dataset, which included 330 rows detailing ski resorts, highlighted the 'Big Mountain Resort' as our primary subject. During the cleaning process, I addressed discrepancies such as the 'fastEight' and 'AdultWeekday' columns being dropped due to missing values or redundancy. There were also anomalies like a resort being open for an implausible 2019 years and 14% of resorts missing ticket price data. I corrected an exaggerated 'SkiableTerrain_ac' value for Silverton Mountain and merged the dataset with state-specific data from Wikipedia, resolving any naming inconsistencies. The refined dataset now has 277 rows and 25 columns.

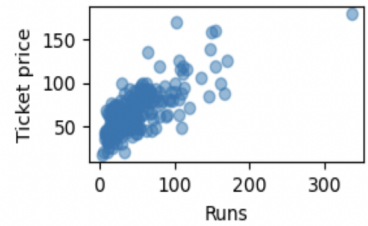
3. Exploratory Data Analysis (EDA):

We analyzed ski resort data to understand factors influencing weekend ticket prices. Although states like 'New Hampshire' and 'Vermont' showed no distinct impact on prices, correlation heatmaps highlighted significant relationships with features like fastQuads, Runs, Snow Making_ac, and chair-to-run ratios. Despite some variations in ticket prices across states, our analysis recommended an equal state treatment in modeling. Our primary aim is to predict the AdultWeekend ticket prices, focusing on resort details and comparisons within states but avoiding overemphasis on state-specific features or highly correlated attributes.

Key Figures:







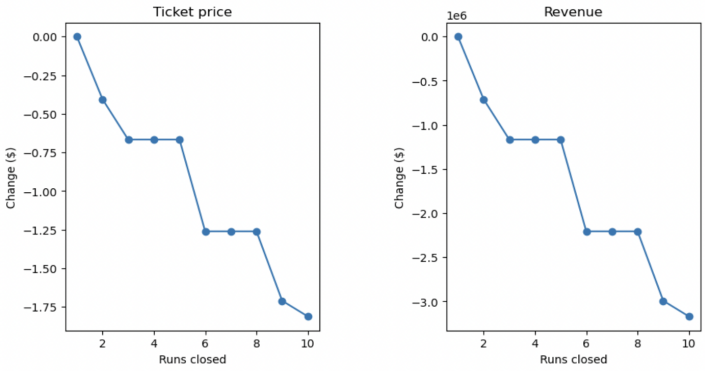
4. Model Building & Evaluation:
Various algorithms, including Liner Regression and Random Forest algorithms, were employed. Performance metrics such as R^2, ean Absolute Error (MAE), were used to evaluate each model.

5. Winning Model & Scenario Modeling:

The Random Forest emerged as the most accurate and reliable. Using this, multiple scenarios were modeled to predict the outcomes of proposed changes.

These scenarios are:

1. *Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.*



The model says closing one run makes no difference. Closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes down 3 runs, it seems they may as well close down 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.

2. *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 $3474638

3. *Same as number 2, but adding 2 acres of snow making cover*

   This scenario increases support for ticket price by $1.99
   Over the season, this could be expected to amount to $3474638
   Such a small increase in the snow making area makes no difference!

4. *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 makes no difference whatsoever.

7. Pricing Recommendation:

The model suggests a price of $95.87 for the Big Mountain resort, which is considerably higher than its actual price of $81.00.

When considering introducing such a change to the business leadership, it's imperative to employ a data-centric approach. We should present the evidence from the modeling which highlights the value proposition of Big Mountain's facilities. Comparing Big Mountain's facilities and pricing with competitors in the market will provide context. Additionally, focusing on the potential revenue increases and the impact on profitability will present a solid business case. It's also important to address any potential concerns about customer backlash. This can be done by referencing historical data of customer responses to price changes in analogous scenarios or markets. For a smoother transition, we might consider a phased approach to the pricing adjustment. Starting with a minor increase, closely monitoring customer response, and making further adjustments as necessary could be the key to success.