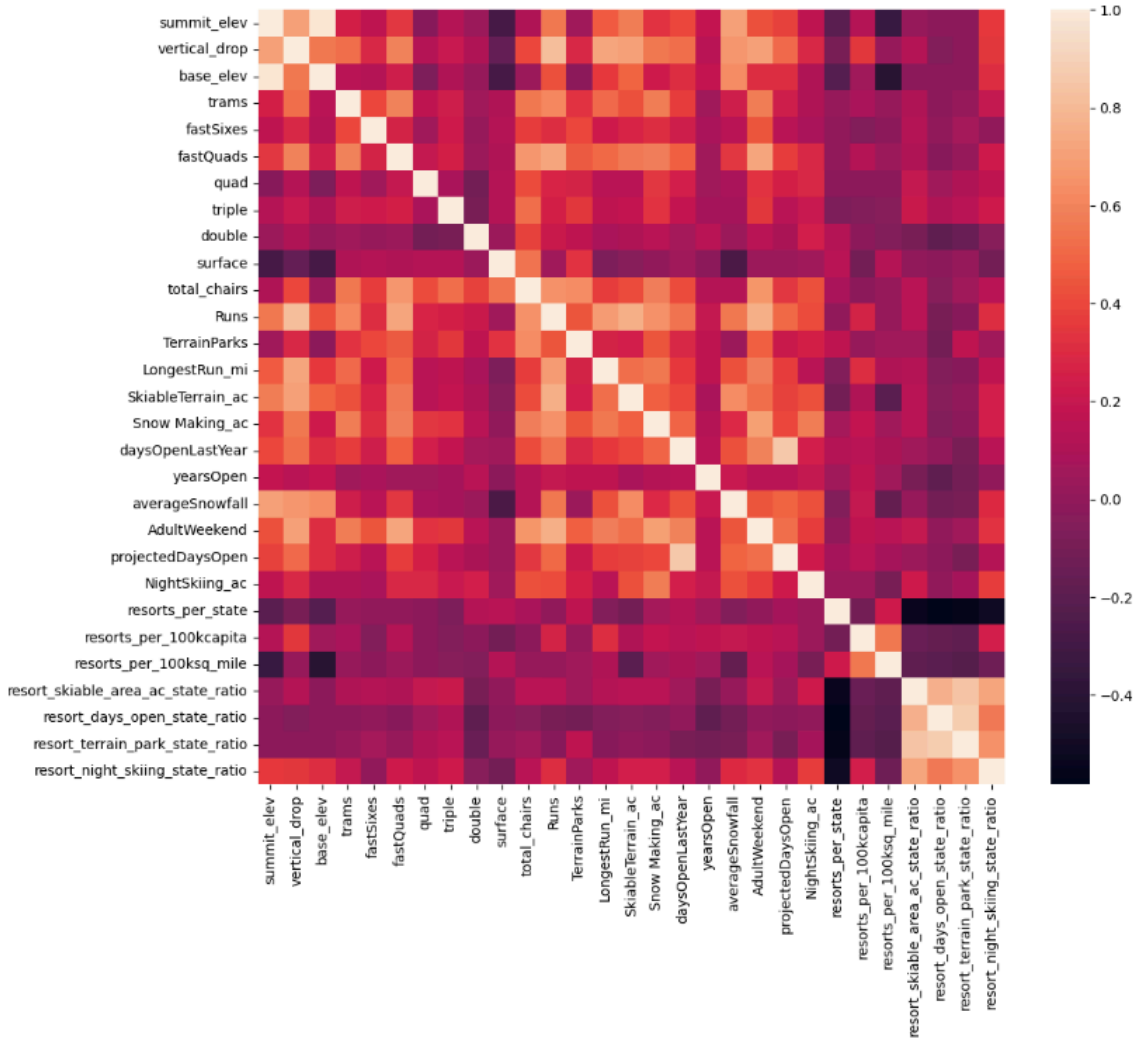
Guided Capstone Project Report

Problem Statement: Big Mountain Resort faces a challenge in optimizing ticket prices given its recent expansion with a new chair lift. The goal is to suggest a suitable pricing strategy considering various factors such as facilities, geographical location, and additional operating costs.

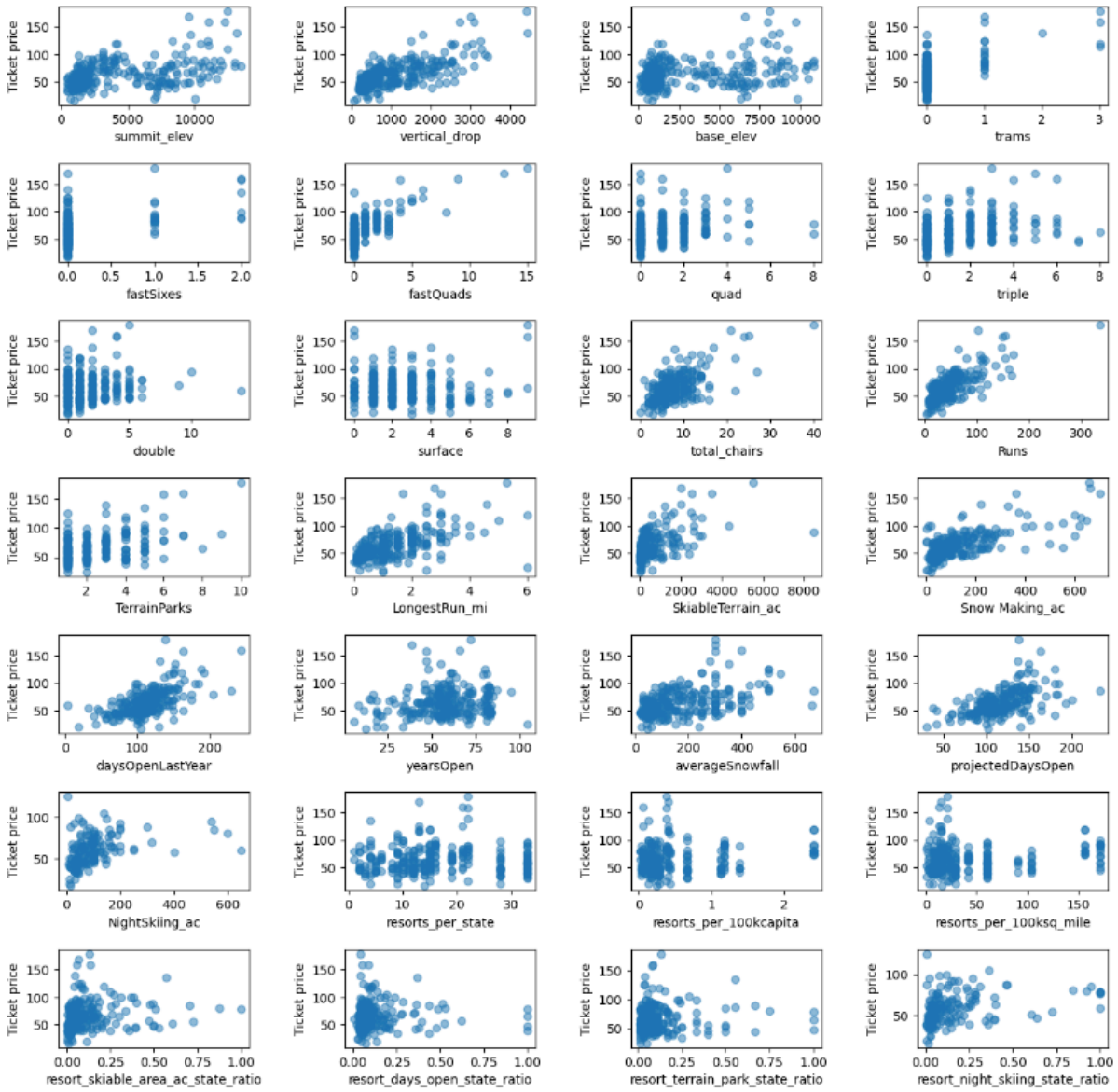
Data Wrangling: The dataset was cleaned and preprocessed to handle missing values and outliers. Relevant features were selected to build a robust model. The target feature for predicting ticket prices is confirmed to be 'AdultWeekend.'

Exploratory Data Analysis: In-depth analysis revealed correlations and patterns. Visualizations, including box plots, heatmap and histograms, provided insights into the distribution of key variables.

- A correlation heatmap was generated to visualize relationships between numeric features, highlighting multicollinearity and providing insights into potential predictors for ticket prices:



- Scatterplots highlighted potential influences on ticket prices:



Model Preprocessing with Feature Engineering: Features were standardized and transformed to meet model requirements. New features, such as the ratio of vertical drop to the number of chairs, were engineered for improved predictive power.

Algorithms and Evaluation Metric: Multiple regression models were employed, with the Random Forest Regressor yielding the best results. Mean Absolute Error (MAE) was chosen as the evaluation metric to quantify model performance.

Winning Model and Scenario Modeling: Evaluated the linear regression and random forest models based on their cross-validated MAE and test set performance. Selected the random forest model for further analysis due to its lower mean absolute error and reduced variability. Various scenarios were modeled, including the impact of the new chair lift on ticket prices and the potential for increased revenue. Scenario 2, which involves adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift is recommended. This scenario, with an estimated increase in support for ticket price by $1.99, shows a positive impact on ticket price and revenue, indicating potential for enhanced visitor

experience and increased profitability. Additionally, Scenario 1- permanently closing down up to 10 of the least used runs - can also be tried by resort. 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.

Pricing Recommendation: The modeling suggests that Big Mountain's facilities could support a higher ticket price in the marketplace. The estimated modelled price is, $83, indicating that there may be room for an increase in ticket prices. The suggested increase aims to reflect the enhanced facilities and maximize profitability.

Conclusion:
The analysis indicates a justifiable increase in ticket prices, aligning with Big Mountain's improved offerings. However, careful consideration of market dynamics and customer sensitivity is crucial.

Future Scope of Work:
Future work should involve expanding the dataset to include detailed cost information beyond the new chair lift. Regular feedback sessions with business leaders can enhance the model's accuracy. Making the model user-friendly for business analysts will facilitate ongoing decision-making processes.