# Project Purpose

This project aims to develop a pricing model for ski resort tickets at Big Mountain. Despite its strong market position, Big Mountain suspects it isn’t maximizing its returns and lacks a clear understanding of which facilities visitors value most—especially those they’re willing to pay for. Our goal is to build a predictive model that accurately prices tickets based on the available facilities at the resorts.

# Tasks Completed

**Data Wrangling**

We examined the raw data, explored data for visualization, and explored relationships between different attributes of the data. Based on initial exploration, the target feature utilized for predicting ticket prices was ‘Adult Weekend’ due to its lack of null values compared to ‘Adult Weekday’.

**Exploratory Data Analysis**

The dataset included both numerical and categorical features. I analyzed the distributions and correlations among these variables, focusing on those most related to the ‘Adult Weekend’ ticket price. A Principal Component Analysis (PCA) & multicollinearity heatmap analysis were performed to reduce redundancy in the features.

A screenshot of a computer generated image

Description automatically generated

**Preprocessing & Training**

After preparing the data, I split it into training and testing sets, then built both a linear regression and a random forest model. The random forest model outperformed the linear regression, offering better predictive power.

|  |  |  |
| --- | --- | --- |
| Model | Mean Absolute Error (deviation between actual & predicted values) | R^2 (predictive power) |
| Linear Regression | 11.8 | 63.7% |
| **Random Forest** | **9.5** | **70.6%** |

**Modeling, Pricing Recommendation, & Conclusion**

With the model in place, the predicted ticket price was $93.73, compared to the current price of $81. This suggests that prices should be increased. To support this, I recommend enhancing marketing efforts and brand perception to justify the higher price. Additionally, closing certain runs during off-peak periods and monitoring customer feedback could provide further insights.

I made this conclusion from looking at different scenarios (closing runs, adding a vertical drop & chair lift, adding acres of a snowmaking, and increasing the longest run by 0.2 miles), and examined different scenarios affect on revenue, potential profits, and customer satisfaction.

**Future Scope of Work**

Future improvements could include incorporating expense data and customer service surveys to evaluate profitability and customer satisfaction. These additions would further refine the pricing model and provide a more comprehensive analysis. Developing a dashboard could also enhance data visualization and decision-making.