# Big Mountain Resort

## Introduction

Big Mountain Resort has recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increases their operating costs by $1,540,000 this season. The business would like to increase their revenue to recoup the increased operating cost. Through this project we want to investigate what opportunities exist for Big Mountain Resort to increase their revenue.

## Problem Statement

We focus on investigate the expected adult weekend price for Big Mountain Resort based on the given resort characteristics.

## Data Wrangling

- Replace the missing values with means or zeros depending on the nature of the feature
- Check for duplicates

## Exploratory Data Analysis

- Evaluate the data for potential outliers or data anomalies
- Review the Pearson correlation coefficient heat map
- Apply k-means clustering and add the clusters as a feature (Figure 1)

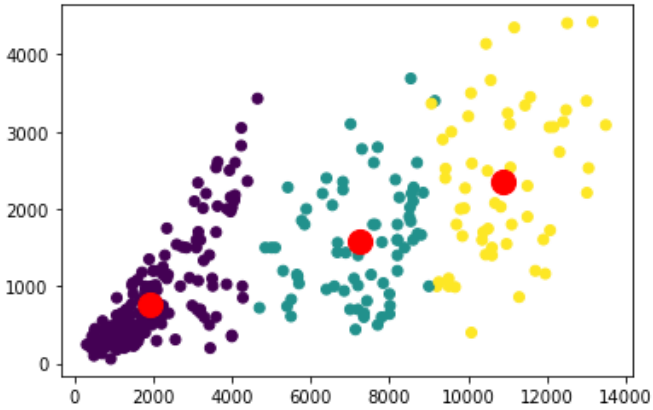


Figure 1. Visualization of Clusters and Cluster Centers

## Modeling

We build three models to predict the adult weekend price and compare their performance on the test dataset (Table 1). We identify model 3 as the final model.

| Model | Explained Variance | Mean Absolute Error | Features Dropped |
|---|---|---|---|
| Model 1. | -2.24333771587819e+22 | 462353067640.7014 | - |
| Model 2. | 0.84 | 6.72 | 'state' |
| Model 3. | 0.84 | 6.69 | 'state','summit_elev','base_elev' |

Table 1. Model Performance Comparison Table

## Recommendations

We recommend Big Mountain Resort to raise their adult weekend price from $81 to $96, based on the prediction from our final model.

From Figure 2 we can see that Big Mountain Resort (the black dot) has one of the largest skiable area among all the resorts, but its adult weekend ticket price is relatively low.

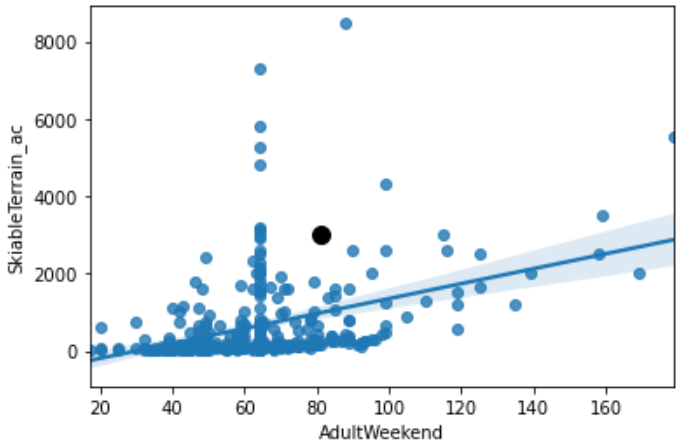


Figure 2. Adult Weekend Price vs Skiable Terrain

If we assume 1) the number of visitors will not be affected by the price change, 2) among the 350,000 visitors of Big Mountain Resort 300,000 of them are adults, and 3) they each visits the resort over the weekend at least one day during the entire season, then Big Mountain Resort can expect $4,500,000 additional revenue if they implement this price increase.