

# Big Mountain Resort key findings

*Aim: To provide evidence of the best suitable method for Big Mountain Resort to implement in order to maintain their current profit margin.*

- With the installation of a chairlift, operational cost has increased by \$1.54million this season.
- Big Mountain Resort needs to maintain or exceed a profit margin on 9.2%.
  - focusing on mutable features of the resort.
  - Which strategies can Big Mountain Resort Implement?

- Problem identification
- We have recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increases our operating costs by \$1,540,000 this season.
- Can we increase ticket prices, or, find another way to cut costs to recoup this loss?

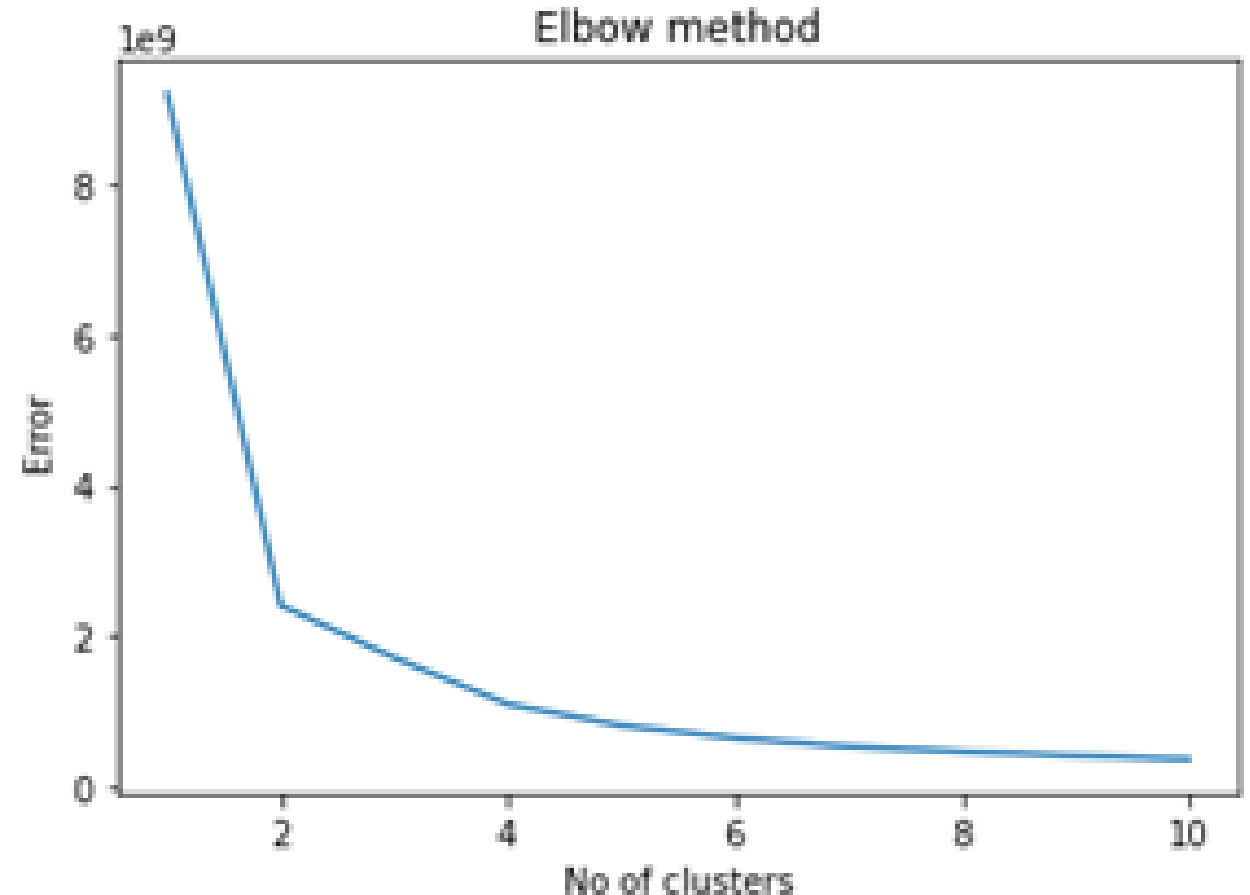
# Recommendation

- Adult admission price of \$64.07 is suitable for current operations.
- With a current price of \$81.00 and an average of 350,000 customers,operational costs of the chair lift will be covered.
- It would be possible to increase the adult weekend lift price to \$98. Because the “Adult Weekend” ticket price is \$81, the predicted value is over \$98. That is \$17 of profit increase every “Adult Weekend” ticket sold.

# Modeling results and analysis

- With the use of the unsupervised classification algorithm, K-means clustering, unknown patterns were identified.
- The k parameter 3 proves to be the most suitable which can be seen in figure 1 below.

*Figure 1:* Elbow plot showing optimum number of clusters.



- Machine Learning Model
- Model the predicted value for the adult admission price using linear regression model.
- By comparing immutable features of the resort, model 3 was chosen from table 1, which is based on model performance metrics.

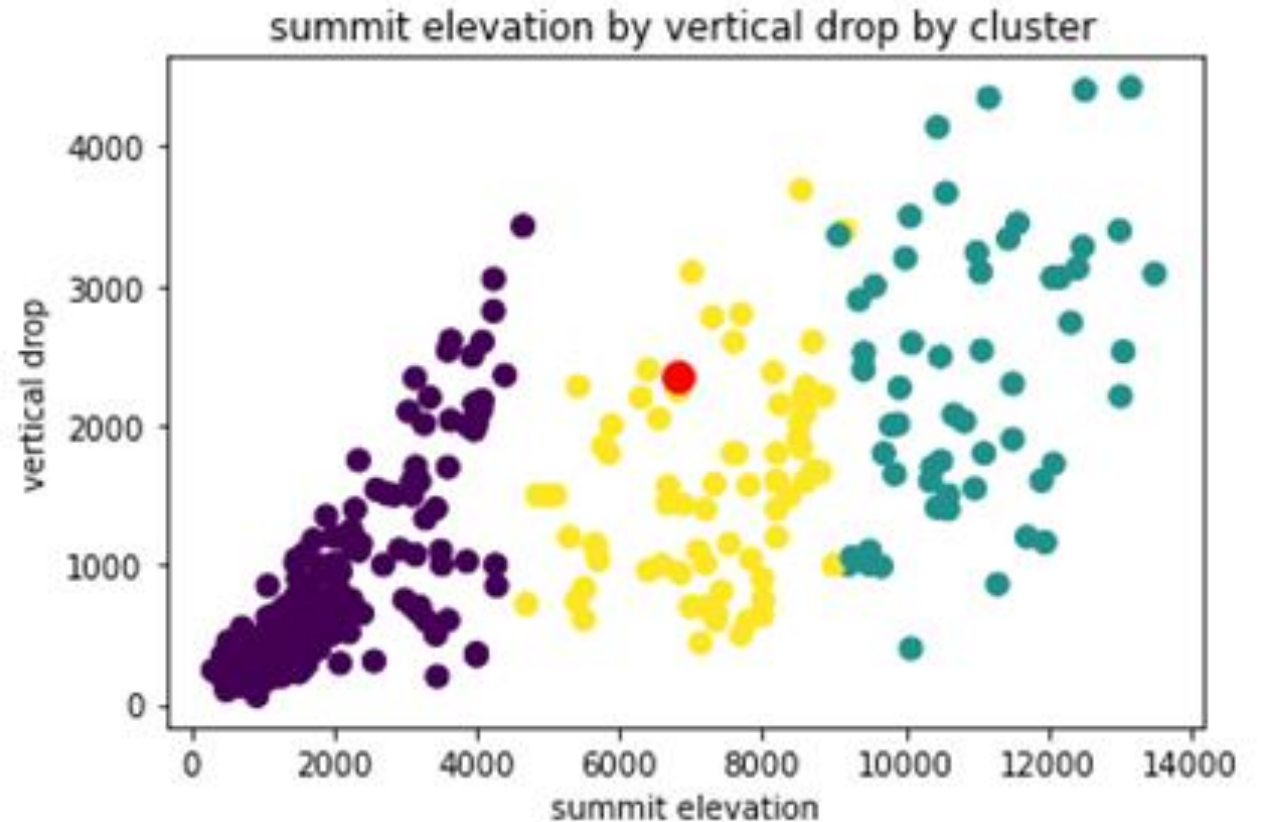
Model	EVS	MAE	Features Dropped
model 1	0.934765	5.045501	-
model 2	0.925548	5.473406	state
model 3	0.931013	5.276298	state,summit elevation, base elevation

Table 1: Model performance metrics

# Results

- In terms of immutable features, Big Mountain Resort falls in the second cluster which is identified from figure 2 below as the red circle.
- From the linear regression machine learning model, a predicted value of \$64.07 is suitable for current operations.
- The greatest influence which can be seen as the coefficient amongst all the features proved to be the adult weekday price.

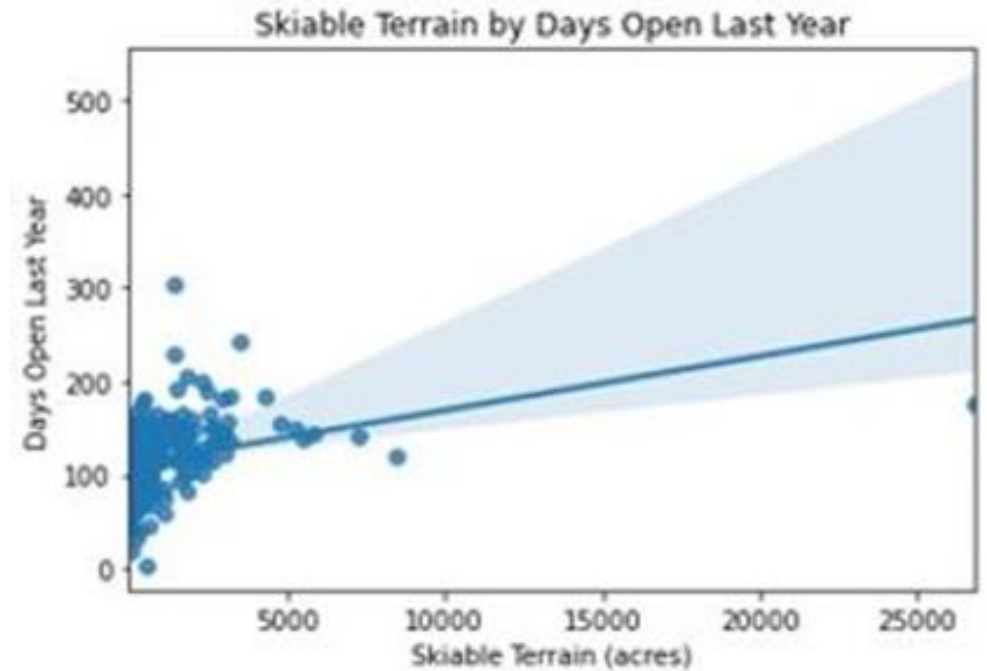
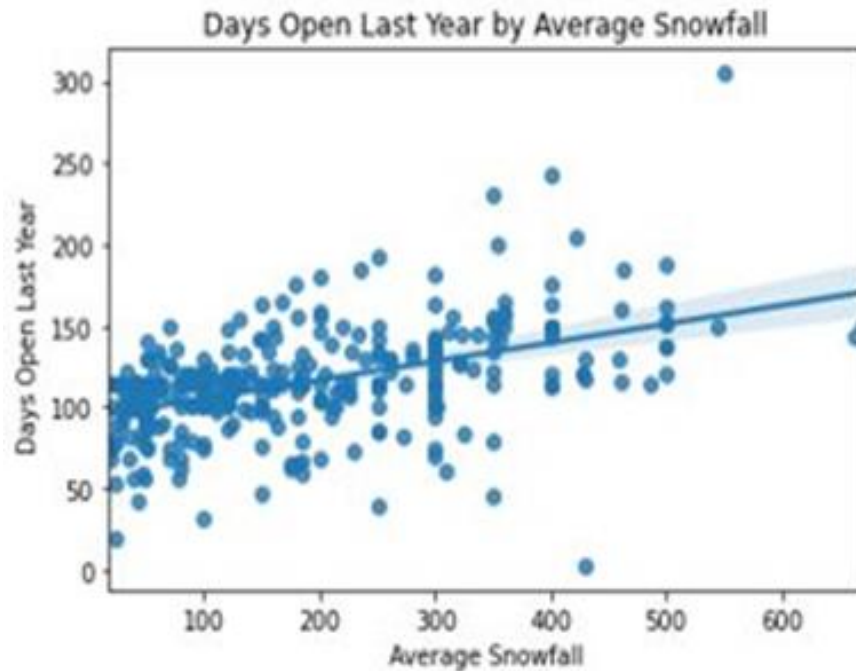
*Figure 2:* Red circle identifying Big Mountain Resort compared to other resorts in the USA.



# Results

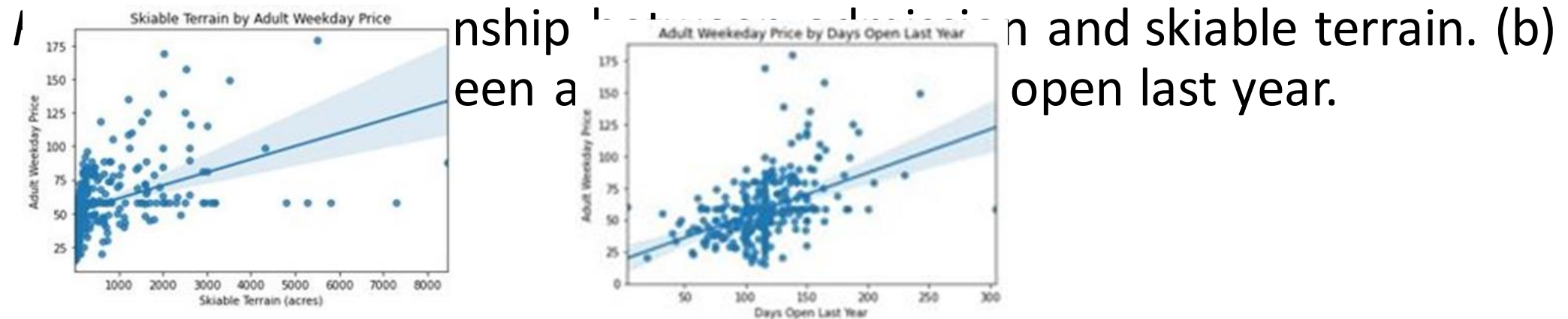
- To increase company revenue , the resort needs to stay open for more days throughout the season.
- From Figure 3, it can be seen with an increase in skiable terrain and average snowfall the resort can stay open for longer.

*Figure 3: (a) Relationship between snowfall and the days open last year. (b) Relationship between skiable terrain and days open last year.*



# Results

- Comparing relationships between other resorts, skiable terrain and admission ticket price. With a larger area per acre, the resort is able to charge a higher price. This can be justified by figure 4a.
- Figure 4b shows how the increase in days open correlates to the price of admission.





# Conclusion

- Since features such as ski resort location, mountain characteristics and transport within the resort poorly explain the outcome of the response variable, my recommendation is that it would not be justified increase the adult price tickets during the weekends just because an additional chair lift was installed in the resort. Therefore, to recover the investment in this equipment, big mountain resort should consider opportunities in decreasing the maintenance cost of the chair lifts.