

Big Mountain Resort Project





Outline

- 1 **Problem Identification**
- 2 **Recommendation & Key Findings**
- 3 **Modeling Results & Analysis**
- 4 **Summary & Conclusion**

Problem Identification

Context: Big Mountain Resort (BRM) recently installed a new chair lift to help increase the distribution of visitors across the mountain. This increased their operating costs by \$1,540,000. Management wants recommendations on recouping the increased costs

“How can we increase this year’s profit in at least \$1.540.000 to recover the increased operating costs resulting from the investment in a new chair lift?”



RECOMMENDATIONS

We suggest that BRM increases their weekend ticket price by about \$5 to cover the costs incurred with the new lift chair.

Recommendations & Findings



FINDINGS

BRM has a lower price than their competitors in term of weekend ticket price. Our model shows that they could consider increasing their ticket price between \$3-\$8

Modeling Results & Analysis

Our Data

We had data for 303 resorts (including BRM). The dataset contained 26 features on topics like geography (state, elevation, etc.), chairs (double, triple, etc.) days and years open, prices, and other features



Limitations

The data was not complete so some assumptions had to be made like filling missing data with the mean of the dataset. These actions did not undermine the study.



Outliers

The case for the outliers is particularly interesting. There are several outliers in our dataset but they were considered correct observations (except one) and thus they were left in the study.



Figure 1: Resort locations

There is a division of the number of resorts per each state. The dataset might at first look a little bit more skewed towards the East side but it is not very accentuated.

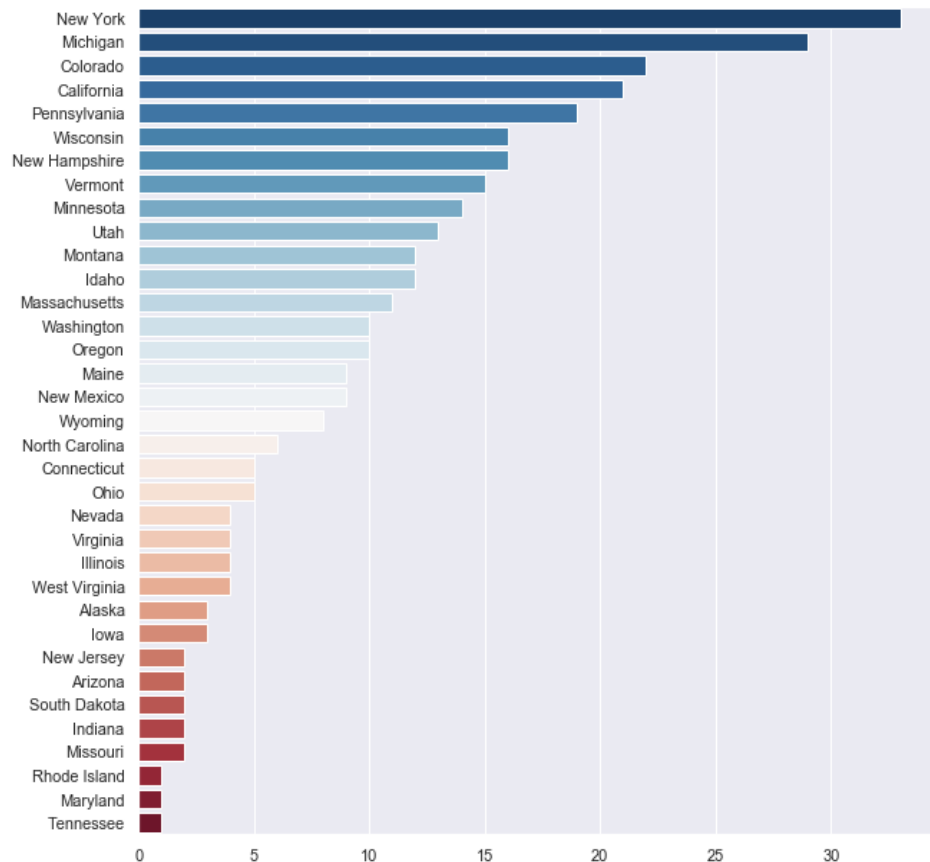
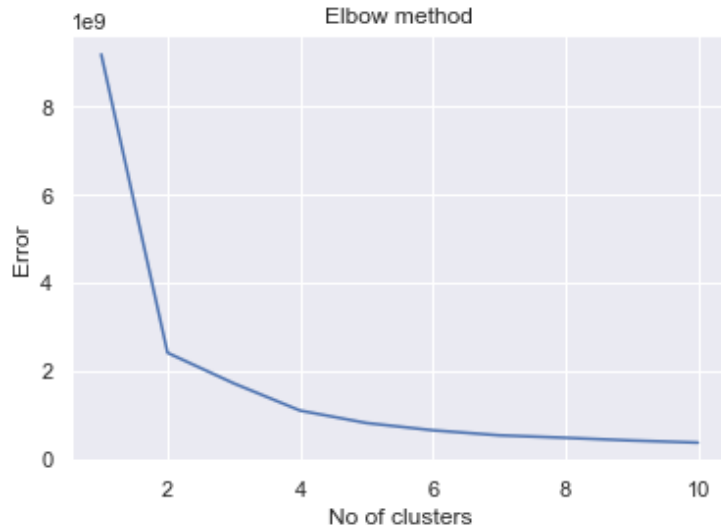
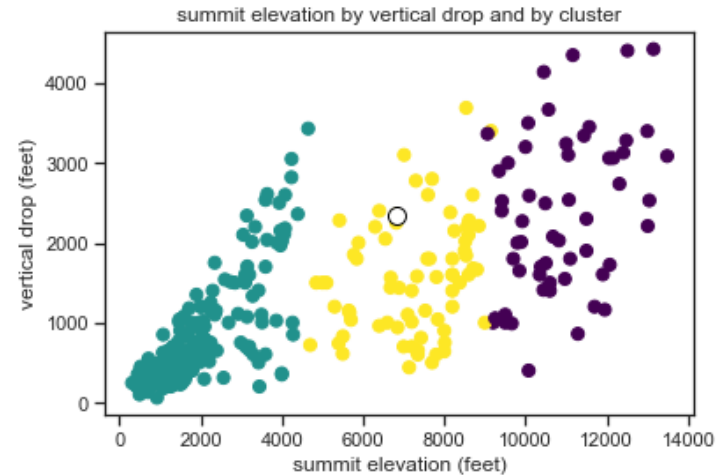


Figure 2 & 3: Clustering



The data allows us to cluster the resorts into 2 or 3 categories without incurring in a lot of error, for this analysis we chose 3 clusters.



We clustered the resorts through the K-Means clustering technique. BRM falls in cluster 2 (yellow color)

Figure 4 & 5: Explained Variance and MAE

Model	Explained Variance	Mean Absolute Error	Features Dropped
Model 1.	0.94	4.9	-
Model 2.	0.92	5.5	'state'
Model 3.	0.93	5.33	'state','summit_elev'

Model	Explained Variance	Mean Absolute Error	Features Dropped
Model 1.	error	error	-
Model 2.	0.53	7.37	'state'
Model 3.	0.53	7.34	'state','summit_elev'

Keeping Outliers

This table shows that our best models results from taking all our existing data. We selected Model 1 and Model 3 to do further analysis.

Removing Outliers

Removing outliers did not seem to have a good effect on our models, the first model returned a very large MAE. Model 2 and 3 have a very low explained variance.

Figure 6: Correlation Matrix

Summit Elevation

In the previous slide we showed how model 3 dropped "summit elevation" as a feature in our analysis. This was done because the correlation matrix shows that it shares almost a perfect correlation with base elevation and it was considered to be answering the trait.

Adult Weekday

The ticket price of adult weekday has a strong correlation with the ticket price for adult weekend but we decided to leave it in the mix for a reason we will explain later.

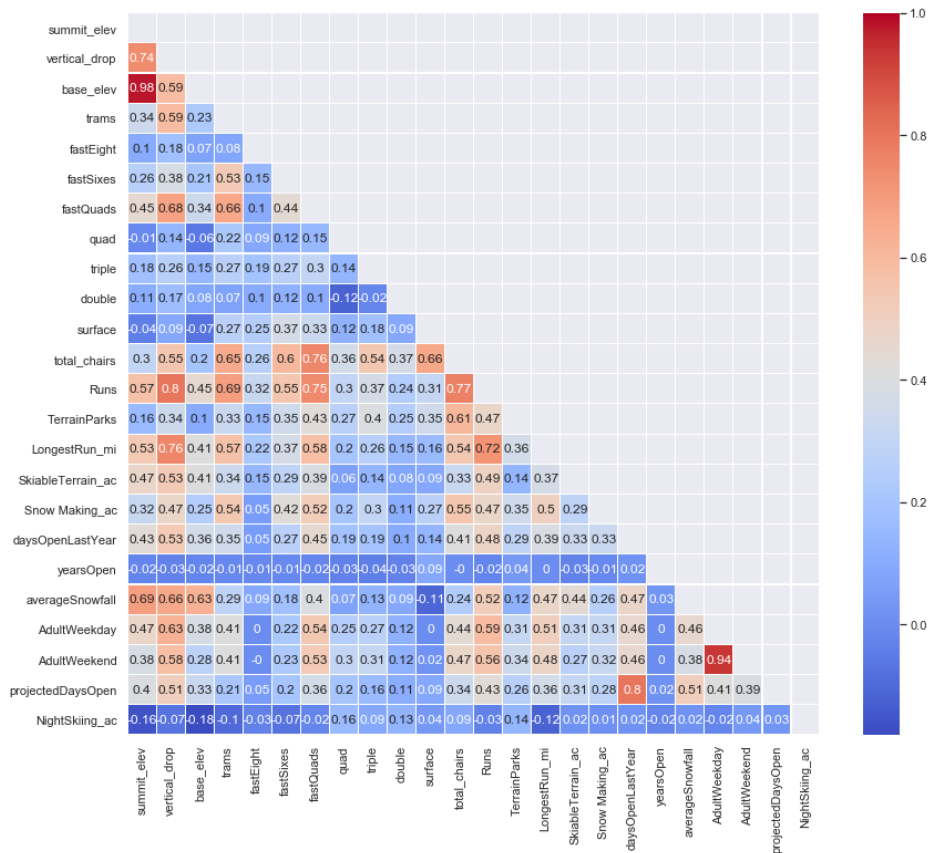


Figure 7: Scatterplot A

Comparison with other resorts

In the following slides you will be able to see how BRM compares in terms of ticket price with other resorts across different variables: **skiable terrain (in acres)**, days open last year, average snowfall (in inches).

The big dots are the current ticket price (left) and the proposed ticket prices (right). The top figure shows the suggested bottom limit of \$84 and the bottom figure shows the upper suggested limit \$89. As a reminder, one considers state and summit elevation (top) and the other one does not (bottom).

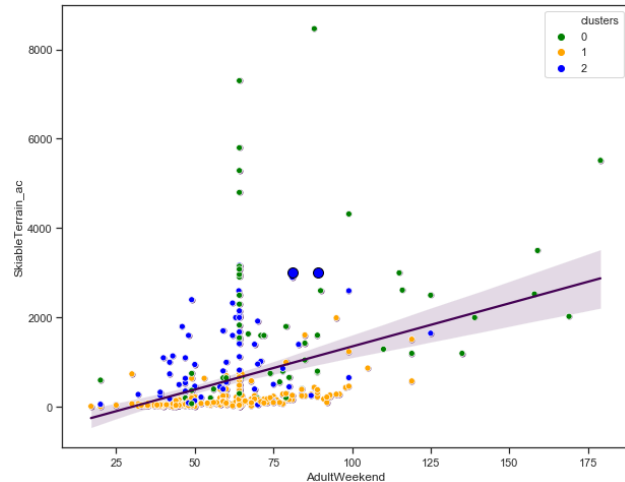
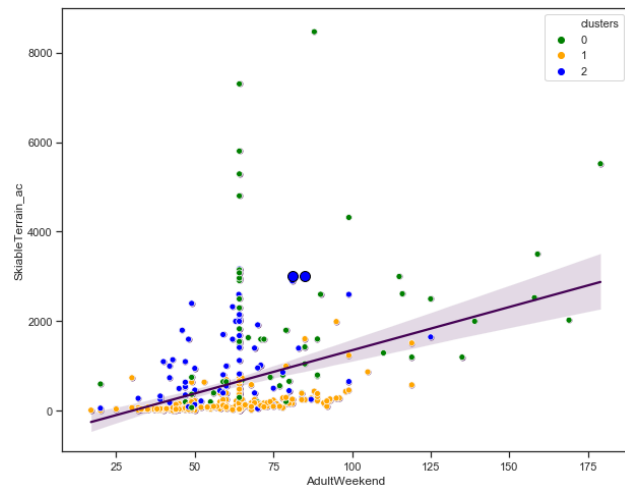


Figure 7: Scatterplot B

Comparison with other resorts

In the following slides you will be able to see how BRM compares in terms of ticket price with other resorts across different variables: skiable terrain (in acres), **days open last year**, average snowfall (in inches).

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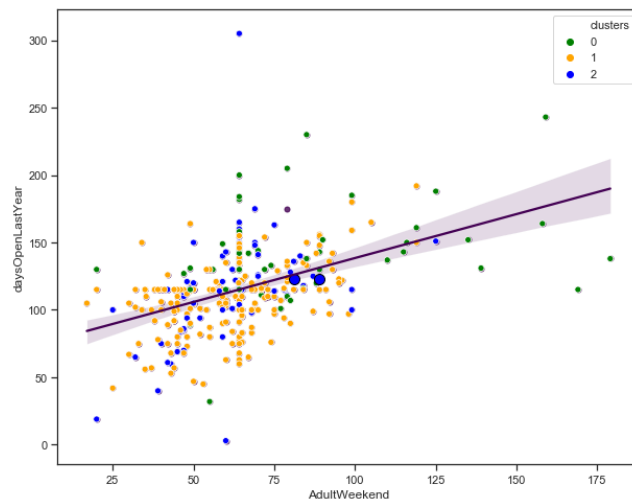
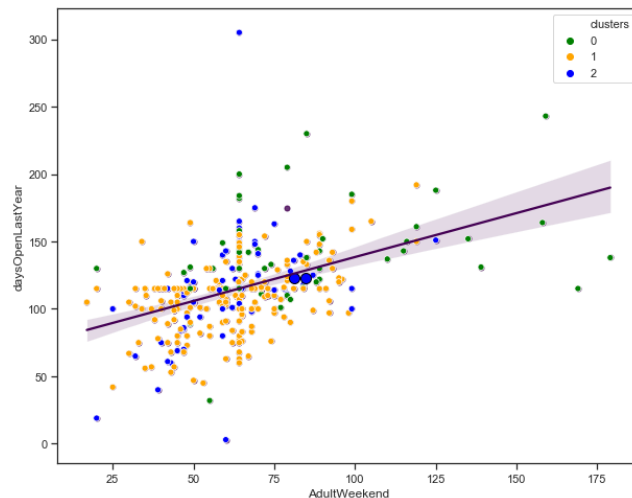


Figure 7: Scatterplot C

Comparison with other resorts

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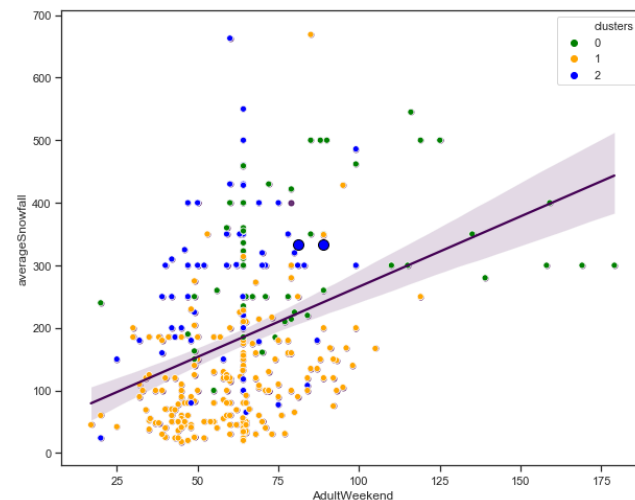
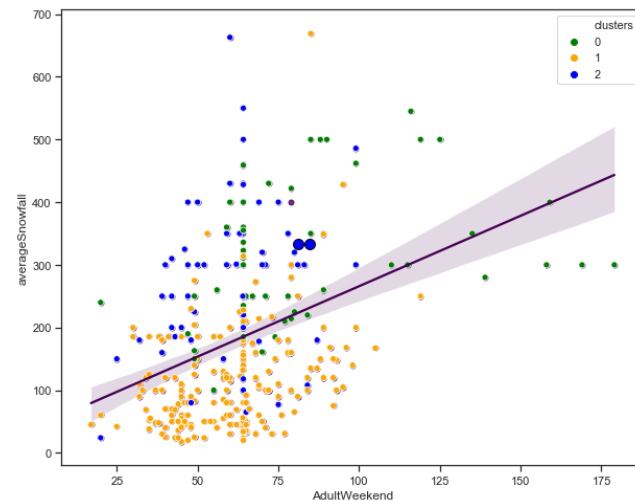
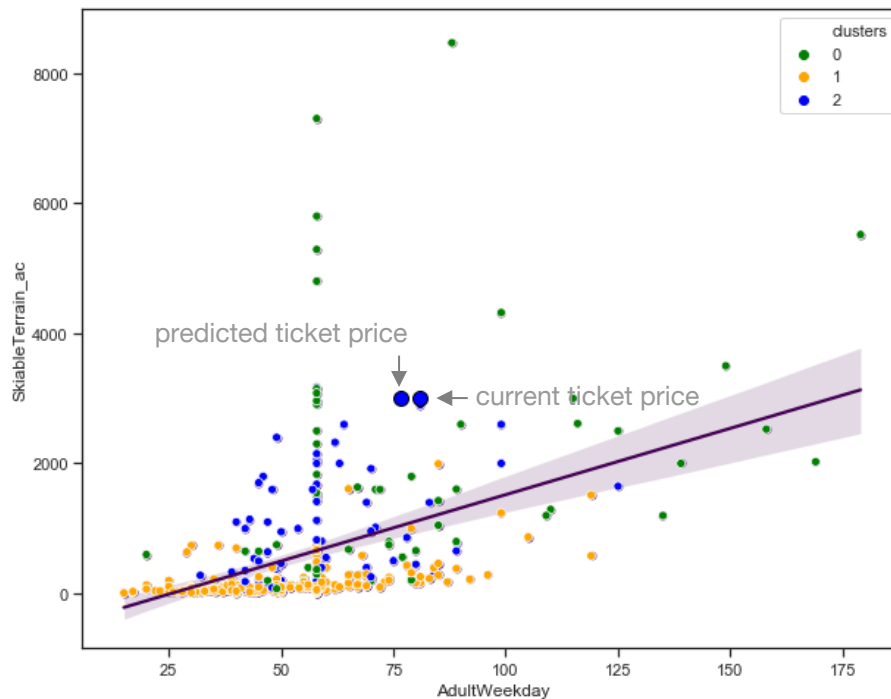


Figure 8: Scatterplot Weekday Price

Comparison with other resorts

Currently, BMR has the same price for weekday and weekend tickets (\$81). Our model suggests that in the case of weekday prices BMR's price is higher than what it predicts (\$76.62).

Nevertheless, having the same price for both types of tickets can make sense from a marketing point of view. This graph just shows that according to the model, taking into consideration the other 302 resorts, the predicted price is lower.



Quick Financial Analysis

	Current Scenario	Scenario 1	Scenario 2	Scenario 3
Number of Skiers	350,000	350,000	350,000	350,000
Ticket Price	\$ 81.00	\$ 84.93	\$ 89.04	\$ 86.33
Approx. Revenues	\$ 28,350,000	\$ 29,725,500	\$ 31,164,000	\$ 30,216,117
Approx. Costs	\$ 25,741,800	\$ 26,990,754	\$ 28,296,912	\$ 27,435,800
Profit Margin	9.20%	9.20%	9.20%	9.20%
Cost difference		\$ 1,248,954	\$ 2,555,112	\$ 1,694,000
CAPEX		\$ 1,540,000	\$ 1,540,000	\$ 1,540,000
Approx. OPEX (10%)		\$ 154,000	\$ 154,000	\$ 154,000
Difference		\$ (445,046)	\$ 861,112	\$ -
New Profit Margin		7.70%	11.96%	9.20%

SCENARIO 1

If we were to assign the new price of \$84.93 our net profit margin would be reduced to 7.70% for the first year. The payback would be 2 years instead of 1.

SCENARIO 2

In this scenario we take the most optimistic price predicted: \$89.04. In this case the net profit margin would raise to 11.96% but we do not recommend this.

SCENARIO 3

A middle ground would be to increase the price to \$86.33 which would keep the net profit margin at current levels.



Financial Analysis Assumptions

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ASSUMPTION 1

We assume that the number of annual skiers is kept at 350.000

ASSUMPTION 2

We are considering net profit margins, not gross or operational.

ASSUMPTION 3

Same price for weekday & weekend skiers and only income from ticket prices (not other services like food sales)

ASSUMPTION 4

We assume an increase in OPEX for the new lift chair of 10% of its original price (for salaries, utilities, depreciation, etc.)

Summary & Conclusions!

We recommend BMR
increasing the ticket price to
\$86 or at least to \$84

PRICE



Our focus has been in ticket price
but there can be interesting in
analyzing the number of days open.

FOCUS



This analysis requires further investigation
from Marketing, Finances, and Operations.
Our report provides some suggestions.

NEXT STEPS



A hiker wearing a blue jacket and a yellow backpack is seen from behind, looking out over a vast, snow-covered mountain range. The hiker is holding trekking poles. The scene is set in a mountainous area with evergreen trees in the foreground and a clear sky.

Thanks!

The code for this
analysis can be found
on [GitHub](#).

Credits

This is where you give credit to the ones who are part of this project.

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