

Big Mountain

Guided Capstone

Data exploration and model processing to create recommendations for Big Mountain Resorts to maintain a 9.2% net profits.

Problem Statement Worksheet (Hypothesis Formation)

How many runs and at what level should the runs that run from the new chairlift that will bring an evenly distributed amount of people to the mountain while maintaining the net profits of 9.2%.

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1 Context

Big Mountain acquired a new chairlift to attract more skiers and snowboarders. This chair's operating cost for Big Mountain is \$1,540,000

The business is eager to get recommendations on recouping the increased operating costs from the new chair this season. What can they expect this years' annual revenue to be if they make the changes you recommend?

2 Criteria for success

Maintaining a 9.2% or higher net profit.
Even distribution of visitors across the mountain. Increase the number of patrons into the resorts by having competitive pricing. What features of Big Mountains should stakeholders consider changing with the chair lift opening.

3 Scope of solution space

Exploring other resorts and their characteristics to make recommendations. Recommending feature upgrades as well as pricing for Big Mountain Ski Resort.

4 Constraints within solution space

Data Constraint, the data provided does not include Big Mountain resort. Gaining proper data sources is difficult and may require user level access to database.

5 Stakeholders to provide key insight

Stakeholders to provide key insight: Sales and marketing. Operating managers that collect data for the resort and the database manager.
Stakeholders that are key decision makers: Investors, Chief Operating Officer, C-level executives.

6 Key data sources

Metadata provided by the database manager.

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Recommendation Key Findings

- Use the dataset with all Ski Resorts in the United states. To find common features that contribute to Adult weekend prices.
- Using a Linear Regression Model to obtain an idealistic Adult Weekend Price that is comparable to other resorts in the United States.
- As well as what other features that contributes to Big Mountain's worth and should be considered when deciding on upgrades or modifications.

Data Exploration and Preprocessing

- Data set with 331 different Ski Resorts were given to analyze with 29 different characteristics.

Description of Characteristics in the Data:

1. chair lift types and speed(fast regular, double, quad, six, eight)
2. Location (State/region)
3. Elevation
4. Prices
5. Area of different types of skiable terrain(skiable area, terrain park)
6. Features of resorts (snow making)
7. Runs (number of , area)
8. Predicted/past days open

Data Cleaning:

1. Deleted Duplicate Data and repeated information
2. Outliers
3. Missing information. Either deletion, mean, or 0's depending on type of data.

Data Preprocessing:

1. changing categorical variables into numerical variables
2. preparing variable for comparison.
3. Created Training set as well as Testing set (75% training, 25% test)

- Resulting data to be processed in the model with 322 different resorts and 26 different characteristics.

Multiple Regression Models were ran with different Parameters

Model Prediction: Adult Weekend Prices

Model Performance: Explain Variance Score, and Mean absolute error

First Model: This model includes all features that were provided in the Data.

Explained Variance Score= 0.77

Mean Absolute Error= 5.94

Second Model: This model excludes states in the model.

Explained Variance Score = 0.82

Mean Absolute Error= 5.84

Third Model: This model excludes states, Base Elevation , and Summit elevation.

Explained Variance Score = 0.79

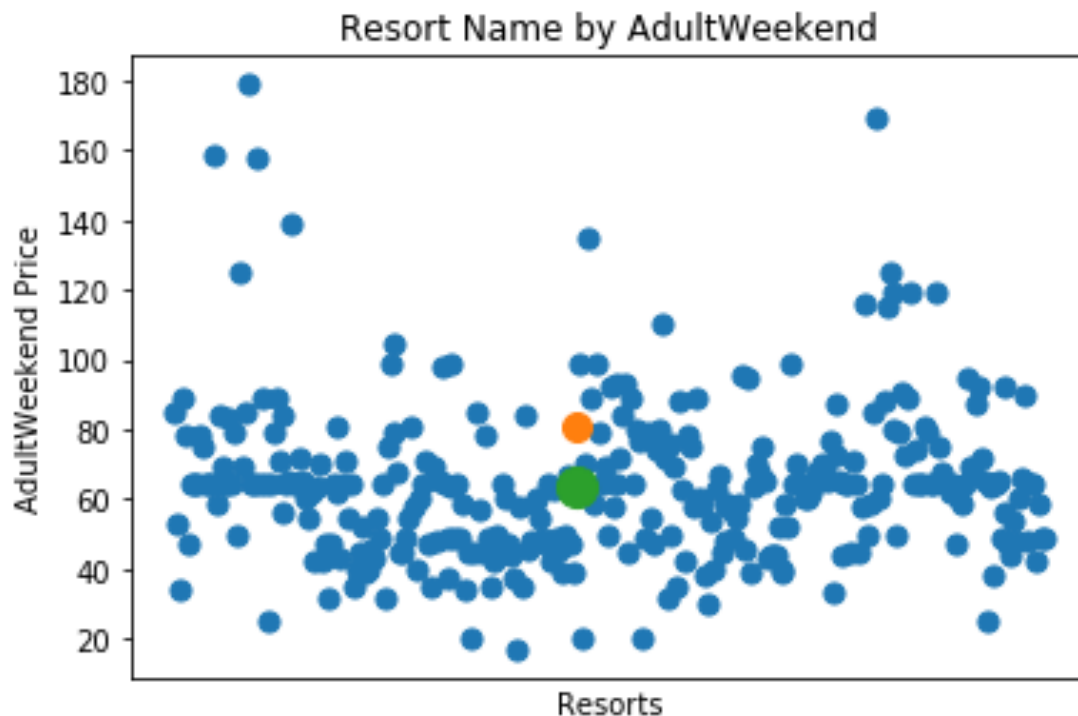
Mean Absolute Error= 6.13

Final Model Selection

The model selected is the second model where the States taken out of the model. This was chosen because it resulted with the best outcome and prediction rate. The explained variance is at the highest and the mean absolute error is the lowest amongst the models. This means that the predicted variable has a smaller room for error.

Predicted Outcomes and performance

Adult weekend Prices were predicted for Big Mountain is 63.94



Variables that effected the model

- Adult Weekday Prices
- Years open
- Skiable square footage
- runs
- The number of regular one person chairlifts
- The number of regular speed four person chairlifts
- The number of fast speed four person chairlifts
- The number of regular speed three person chair life
- The number of days open last year
- Where the location of the mountain is
- projected days open for the ski resort.

Summary and conclusion

Using linear regression model to predict Adult Weekend price which resulted in having 81% explained variance.

Recommendation to Big Mountain Resort is to lower Adult weekend prices to 63 to be competitive amongst other Ski Resort.

Other aspects of the Resort can be improved are:

- Adult Week day pricing
- Increasing Skiable Terrain
- Increasing number of runs

Recommendations:

Further analysis is to consider the following characteristics for improvements or contributing factors to the model.

Implement recommended changes and re-evaluate new data with the old to see if sales increase had happened and that lower the prices to Big Mountain resort was a good way to attract more patrons.