Target Price Analysis: Big Mountain Resort
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Introduction

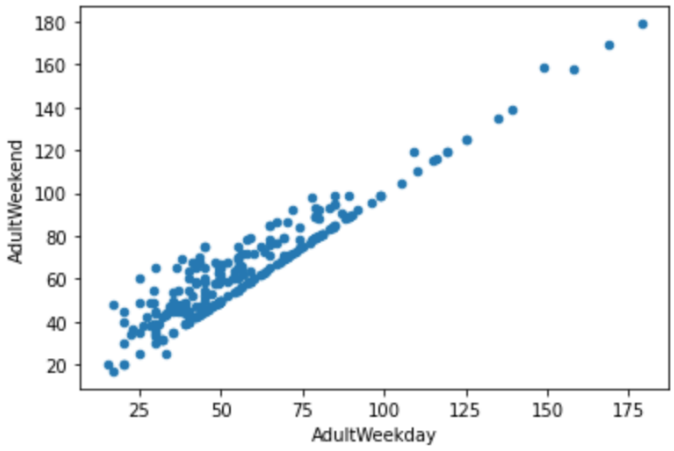
Big Mountain Resort, a ski resort located in Montana has invested in additional chair lifts to increase distribution of skiers across the mountains.Services include 11 lifts, 2-T bars and 1 magic carpet for novice skiers.The base elevation is 4464 feet, summit feet 6817 and longest run is 3.3 mile. However the additional chair lift has increased operation cost for the current season by $1.54M. Currently with a pricing model based on just above market average rate, the resort is not able to offset increased operational cost. Management has expressed desire to implement a data-driven business strategy, reduce operational cost and increase business profitability

Problem Statement

How should Big Mountain Resort develop and implement a new business strategy to increase 10% revenue by offsetting newly season operational cost for the resort by either a) implement changes that will reduce cost without impacting ticket price or b) support an even higher ticket price to meet business profitability.

Data Wrangling

Raw dataset included multiple critical values one off which was AdultWeekday and AdultWeekend Pricing. To evaulate whether a different pricing model was used for weekday vs weekend by different states we graph the points to investigate as shown below. Results from graphing showed most resorts in all states are priced the same.

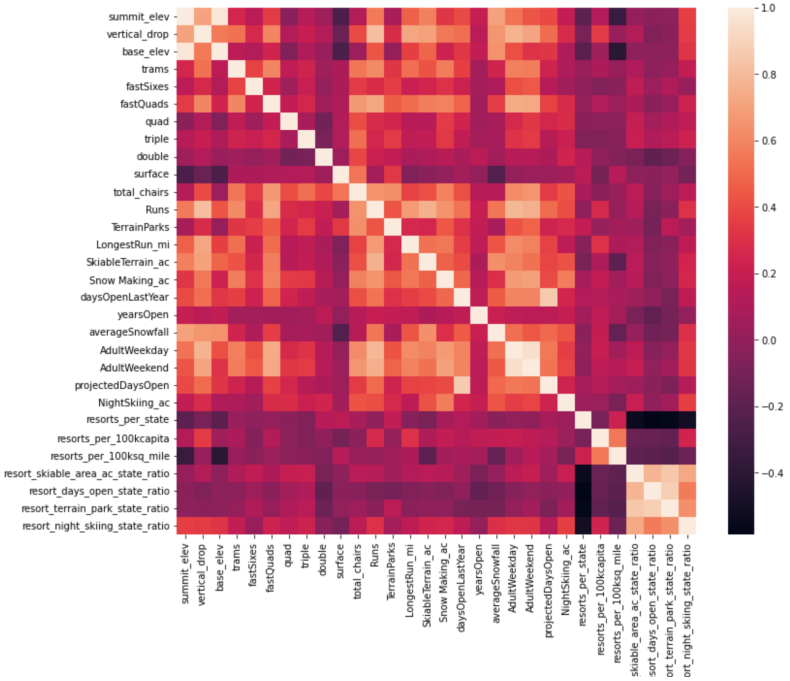


Original ski_data had 330 rows and 27 columns. We had to drop 2019 row in yearsOpen column due to the fact it had non applicable data. fastEight column was also removed due to a great amount of NA values.For Silverton Mountain SkialbeTerrain_ac was altered to accurate data we find through investigation as the original value was an outlier. At the end we are left with a data set with 277 rows and 25 columns.

Exploratory Data Analysis

To find any insights in this structured data we need to find patterns and trends to help guide us in the correct direction. Multiple relationships were investigated to find some clarity on the data set, we scaled

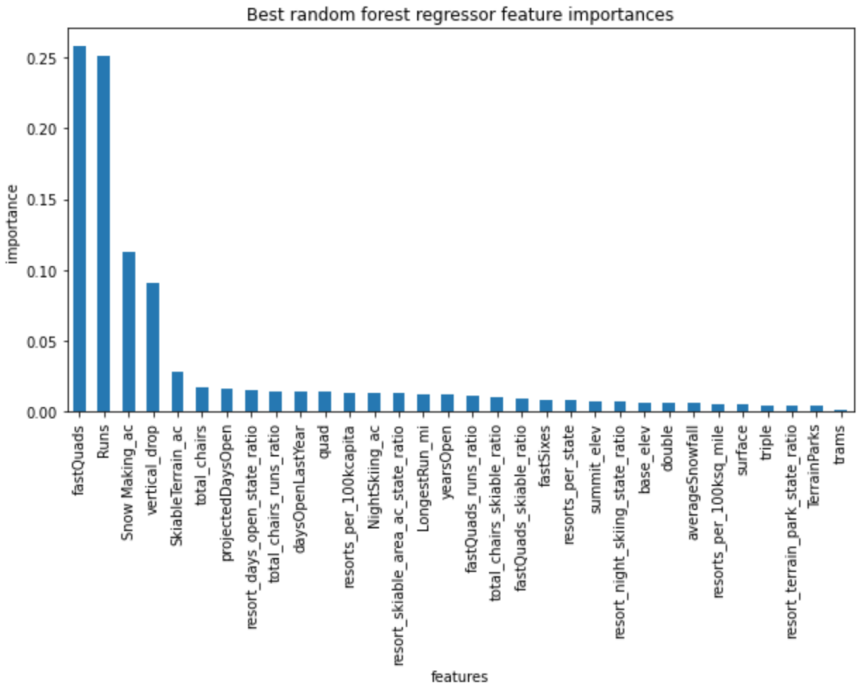
the data using PCA to evaluate columns with different units. By scaling the data we can see the numeric relationship between two datasets that might have different conversion units. We used a heat map to showcase the relationship that were investigated as shown below.



Focusing on the AdultWeekend pricing column we see a positive relationship with Snowmaking_ac,runs,fastQuads and vertical drop. We will use these features to build a model that can help determine a data driven decision on new ticket pricing.

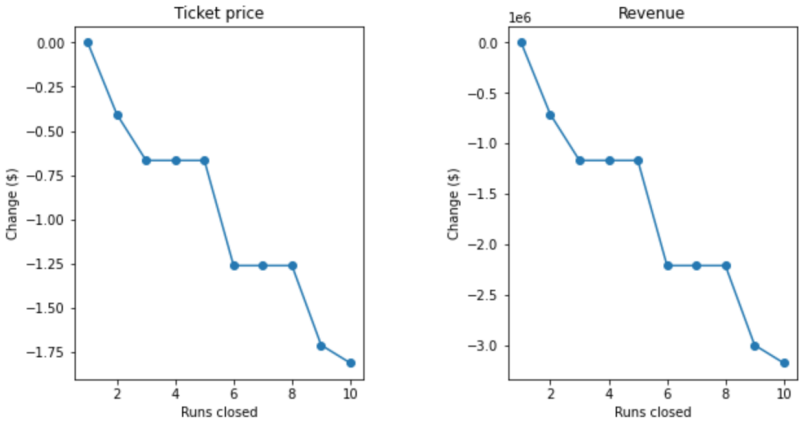
Pre-Processing and Training

Initial step involved isolating the Big Mountain Resort data and performing a train/test spilt(70/30) on the data set. Then we calculated the mean of both set to identify accurate representation off the data, we found linear regression R2 value 0. This indicated the mean data is not accurate in representing the data set. We calculated the MAE of train data and found error of around 19 in test data and ticket price. Then we created a linear regression model using StandardScaler function to correctly rescale the function, after the R2 values came out to 0.82 and 0,72. Using this scaled model, we saw a change in price by $9 rather than 19 providing us with a more reasonable amount. Next step was to create a pipeline, this reduces steps by condensing the rescaling and linear regression into one function. Using SelectKBest and F_regression through sklearn the linear model was improved.We expanded the k value to 15 from default 10 to use all values in the data set for better prediction. During cross-validation using GridSearchCV the best k value turns out to be 8. Observation made from dta was that skiable terrain is negatively associated with price, this could be various reasons. Then we implemented Random Forest Model. We defined another pipeline(RF_pipe) using strategy median instead of mean. For future steps Random Forest model will be implemented as its proven to be most effective and captures top 4 features fastQads,Runs,Snow Making and vertical drop as linear model.



Modeling

Big Mountain resort currently charges $81 as there current price for visitors. Based on the modeling results and resort features compared to remaining resorts, they can charge $95.87. The big mountain resort is undercutting themselves with ticket prices even given they are outperforming the market in 6 out of 7 critical areas. Money for operating cost on additional chairs will be recouped only $1.99/per ticket increase over the season, keeping business in profitable state.If they resolve to closing down 5 lanes to reduce operational cost based on random forest model this will not have a dramatic cost impact and can keep business sustainable.We came to this conclusion by using random forest regression to output a data driven value.



Conclusion

Big Mountain Resort is undervaluing themselves given resort features and market competition when it comes to ticket pricing. The analysis shows that the resort can increase the ticket pricing from $81 to $95.87 without impacting the number of ski-visitors and decrease operation cost by closing down

5 lanes as not all are being used given there 350,000 visitors per year. These steps will help big mountain resorts remain in profitable-state throughout the coming seasons.