Guided Capstone Project Report by Shailaja

Problem Statement:
What opportunities exist for Big Mountain Resort to effectively develop and implement a new pricing strategy that can maximize capitalization in their facilities investments to offset their recent additional operating cost by $1.54M this season, and maintain the annual profit margin at 9.2%.

Big Mountain Resort has recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increased their operating costs by $1,540,000 this season. Every year about 350,000 people ski or snowboard at Big Mountain. This business profit margin is 9.2% and the investors would like to keep it there. The business wants to know the recommendations on increased operating costs from the new chair this season, so that NNUl profit margin stays at 9.2%

Data
Data cleansing was performed primarily focusing on the following
- Handling the missing and NA values
o Which were handled mostly using mean, ffill and fillna methods
- Removing duplicate rows
o However, no duplicate rows were identified

Findings
Based on exploring the relationships between ticket price and other factors of resorts from all states, we listed out facilities/ factors with the highest correlation as below:
- Vertical drops
- FastQuads
- Runs
- Total chairs
- Snow Making area
- Night skiing capacity

Scenarios:
4 strategies were shortlisted and presented to the data science team, to maximize profits and revenue,

- Permanently closing down upto 10 of the least used run
- Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage
- Same as number 2, but adding 2 acres of snow making cover
- Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

To investigate the impacts of these 4 changes on the supported ticket price and the resort's revenue, a predictive model was built on the dataset and used to predict supported ticket prices and revenues for the current feature levels of Big Mountain, and then for feature levels reflecting each of these changes individually.
The third scenario provided support for an increase in ticket price by $10.39 and projected over the season, to amount to $15,782,717 dollars, once the operating costs for an additional chair are taken into consideration. This additional $10.39 a ticket, puts Big Mountain Resort, if rounded up, to $91.00 dollars a ticket. This puts the resort closer to the suggested ticket price of $94.22. Additionally, closing one run , to decrease any associated operating costs caused by having a chair lift, should be considered as well.

Chart: Heat map showing correlations among features
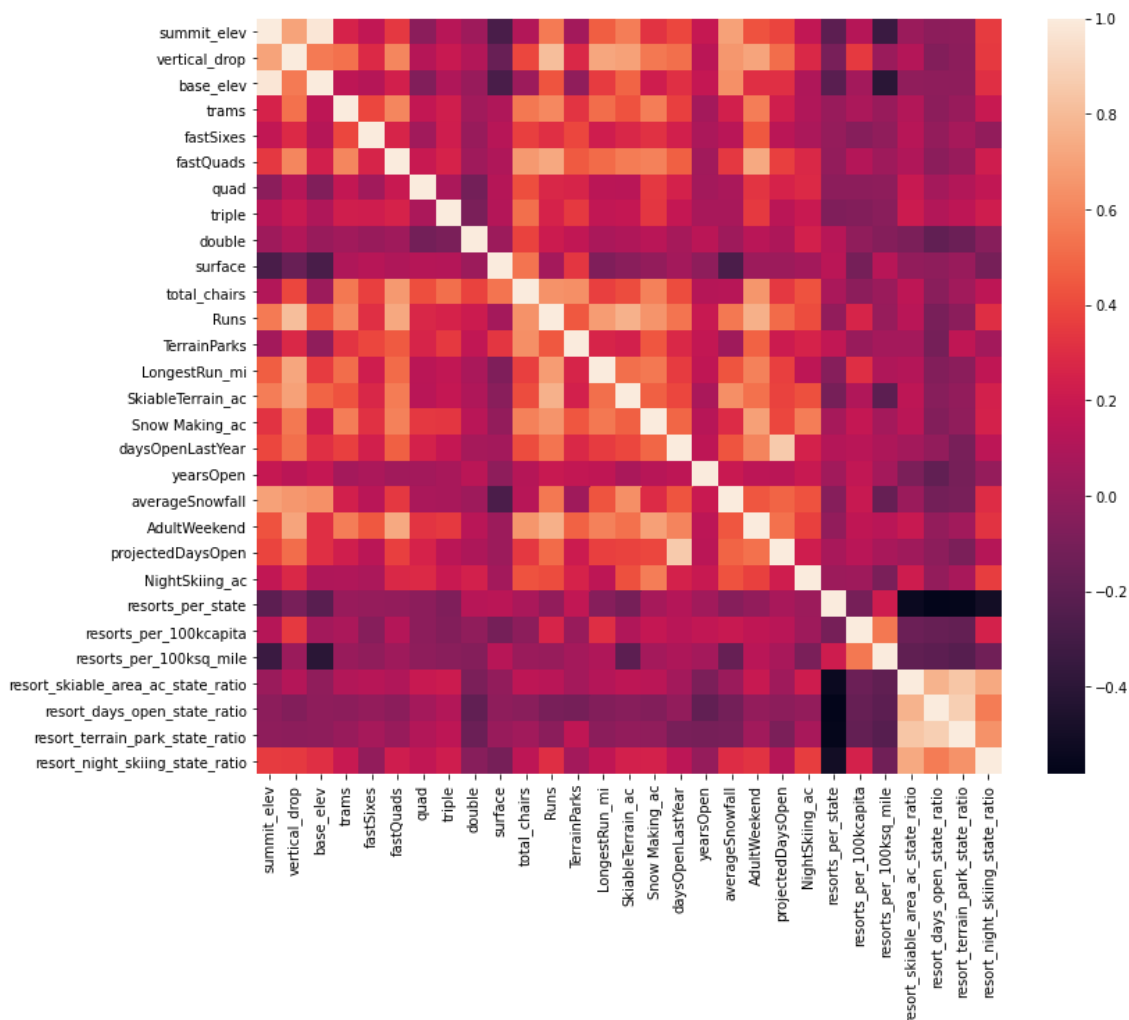
The below plots illustrate the effects of closing a certain number of runs on the supported ticket price and on revenue. The shapes of the graphs are similar because the revenue delta is calculated using the ticket price delta times some constant scale factor (the expected number of visitors 350,000 times the expected number of tickets each visitor will buy 5)

The graph essentially conveys these facts :
● Closing 1 run will have no impact on the supported ticket price
● 3-5 runs can be closed with the same effect
● Closing more than 6 runs leads to a significant price drop

In conclusion, the data science team therefore recommends either closing 1 run or 5 runs if

the expected savings of closing 5 runs exceeds the potentially lost revenue of doing so, reflected by the second graph.