Springboard Guided Capstone for Data Science Track

Big Mountain Resort

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Context

Problem Statement Worksheet (Hypothesis Formation)

What opportunities exist for Big Mountain Resort to increase annual Revenue , particularly by selecting a better value for the ticket price of New Chair Lift to compensate increased operating costs by $1,540,000 this season.

Problem Context

Big Mountain Resort, is a ski company.that has recently invested in an additional chair lift installation to help increase the distribution of visitors across the mountain. This additional chair increased their operating costs by $1,540,000 this season. The business wants some guidance on what should be the ticket price for this chair lift to increase revenue.

Scope of solution space

- Analyse the ski Resorts data and calculate whats the avg number of lifts required with similar base elevation, summit and vertical drop.
- how many lifts other companies have installed and what's percent change in ticket price with increase in elevation and vertical drop. (finding correlation between price and elevation/ vertical drop / summit)
- Then set the ticket price of new lift and change the price of preinstalled ones.

Constraints within solution space

- Limited Data access as Gaining access to the proper data sources can be difficult as it requires specific user level access granted to a SQL database or an S3 bucket.

The business has shortlisted some options to resolve the issue::

1. Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.
2. 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
3. Same as number 2, but adding 2 acres of snow making cover
4. Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

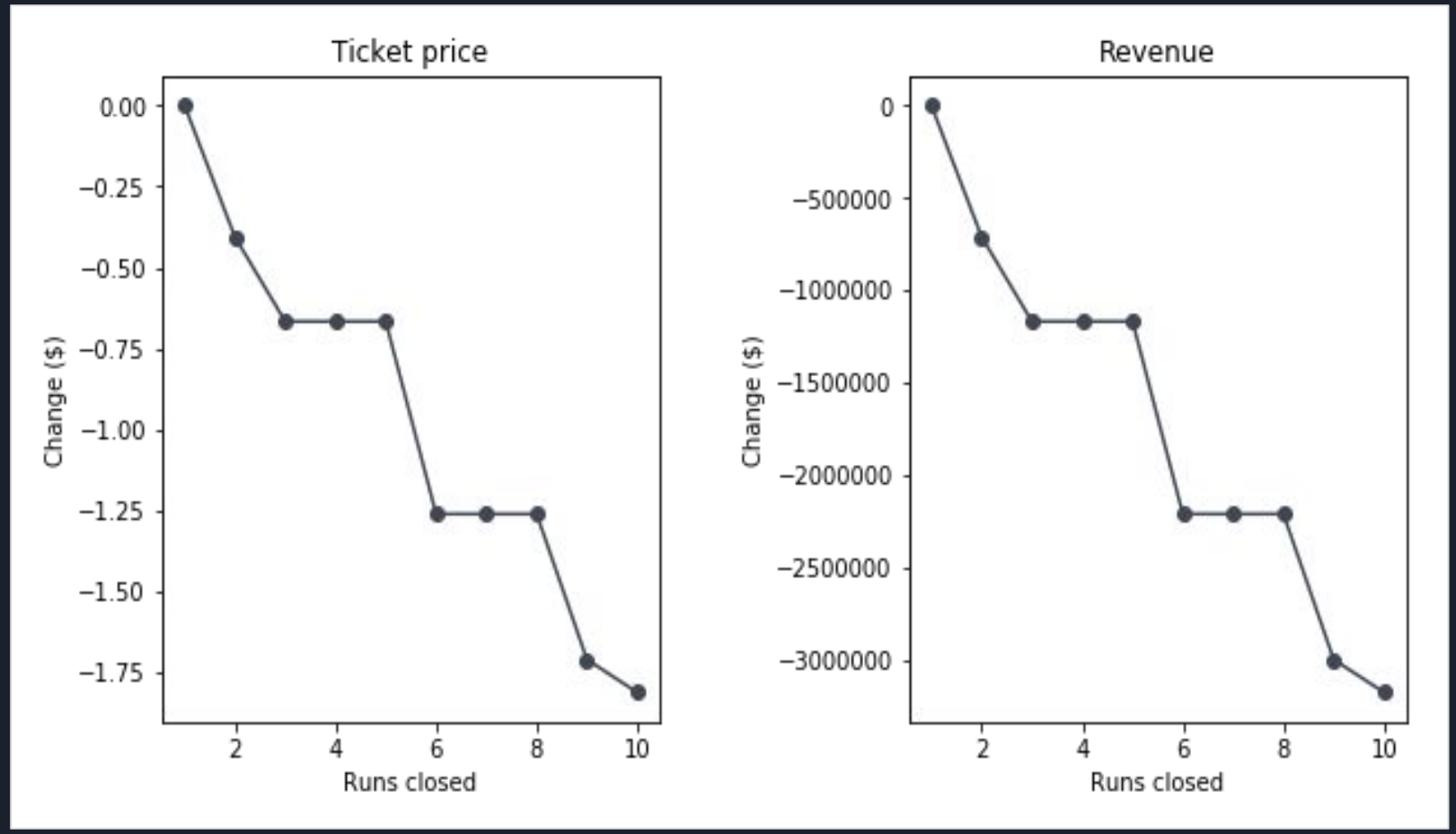
Modeling Results & Analysis

- We standardized our dataset to allow for any machine learning modeling to make predictions, by handling categorical values, in this case the state feature.
- We then standardized the magnitude of the numeric values in the dataset in order to create a training and testing dataset.
- our calculations predicted revenue for each scenarios given by the business

Scenario 1:

Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.

The model says closing one run makes no difference. Closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes down 3 runs, it seems they may as well close down 4 or 5 as there's no further loss in ticket price. Increasing the closures down to 6 or more leads to a large drop.



Scenario 2:

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

- This scenario tends to increase the ticket price by $1.99 generating an annual revenue of $3474638 for Big mountain resort.

- Therefore runs, vertical_drop,total_chair, Snow Making_ac are the facilities that plays most important part in ticket price.

Scenario 3:

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,

with additional snow making coverage adding 2 acres of snow making cover

- Same as scenario 2 except addition of 2 acres of snow cover.

- such a small increase in the snow making area made no difference to revenue calculation.

Scenario 4:

Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

- This scenario calls for increasing the longest run by .2 miles and guaranteeing its snow coverage by adding 4 acres of snow making capability.

- No difference whatsoever. Although the longest run feature was used in the linear model, the random forest model (the one we chose because of its better performance) only has longest run way down in the feature importance list.

Summary & Conclusion

- Thus the best solution would be to Increase the vertical drop by adding a run to a point 150 feet lower down and installation of an additional chair lift to bring skiers back up, without additional snow making coverage and increasing the ticket price by $1.99.