Steps

1. Write a 1-2 page report summarizing your recommendations for Big Mountain Resort. Be sure to include the figures you created to back up your recommendations. See what should be included in this rubric.
2. Title this document "Guided Capstone Project Report"
3. Add your project report to your GitHub repo Guided Capstone folder
4. Submit a link to the folder below

The objective of this project was to predict the adult weekend ticket price through model comparison. After completing data cleaning and imputing missing values in both the training and test datasets, several key features emerged as significant predictors:

- Vertical drop.
- Snow-making area.
- Total number of chairs.
- Number of fast quads.
- Number of runs.
- Longest run length.
- Presence of trams.
- Skiable terrain area.

Subsequently, we tested Linear Regression and Random Forest models. Ultimately, the Random Forest model exhibited a lower cross-validation mean absolute error, nearly $1 less than the Linear Regression model. However, it was observed that the modeled price exceeded the actual price by over 15%, raising concerns about competitiveness as shown in the screenshot below.

5.7 Calculate Expected Big Mountain Ticket Price From The Model ¶

```
]: X_bm = ski_data.loc[ski_data.Name == "Big Mountain Resort", model.X_columns]
   y_bm = ski_data.loc[ski_data.Name == "Big Mountain Resort", 'AdultWeekend']

]: bm_pred = model.predict(X_bm).item()

]: y_bm = y_bm.values.item()

]: print(f'Big Mountain Resort modelled price is ${bm_pred:.2f}, actual price is ${y_bm:.2f}.')
   print(f'Even with the expected mean absolute error of ${mae_mean:.2f}, this suggests there is room for an increase.')

   Big Mountain Resort modelled price is $93.63, actual price is $81.00.
   Even with the expected mean absolute error of $10.20, this suggests there is room for an increase.
```

This result should be looked at optimistically and doubtfully! The validity of our model lies in the assumption that other resorts accurately set their prices according to what the market (the ticket-buying public) supports. The fact that our resort seems to be charging that much less that what's predicted suggests our resort might be undercharging. But if ours is mispricing itself, are others? It's reasonable to expect that some resorts will be "overpriced" and some "underpriced." Or if resorts are pretty good at pricing strategies, it could be that our model is simply lacking some key data? Certainly we know nothing about operating costs, for example, and they would surely help.

Adult weekend ticket price ($) distribution for resorts in market share
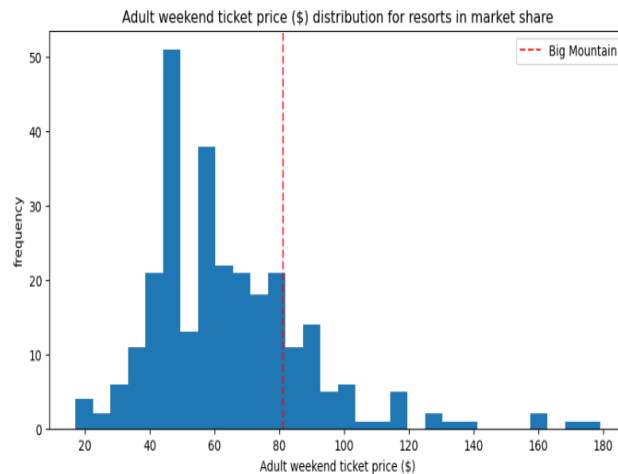
Given this discrepancy, Big Mountain Resort should explore scenarios aimed at either reducing costs or increasing revenue, or ideally, both. For example, based on the dataset, implementing changes such as adding a run, increasing the vertical drop by 150 feet, and installing an additional chairlift would only marginally increase the ticket price by $0.52, resulting in an expected revenue boost of $907,407 as depicted in the screenshot below.

5.9.2 Scenario 2

In this scenario, Big Mountain is adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift.

```
#Code task 4#
#Call `predict_increase` with a list of the features 'Runs', 'vertical_drop', and 'total_chairs'
#and associated deltas of 1, 150, and 1
ticket2_increase = predict_increase(['Runs', 'vertical_drop', 'total_chairs'], [1, 150, 2])
revenue2_increase = 5 * expected_visitors * ticket2_increase
```

```
print(f'This scenario increases support for ticket price by ${ticket2_increase:.2f}')
print(f'Over the season, this could be expected to amount to ${revenue2_increase:.0f}')
```

```
This scenario increases support for ticket price by $0.52
Over the season, this could be expected to amount to $907407
```

In summary, Big Mountain Resort should prioritize investment in three key features: runs, vertical drop, and chairlifts, as these are areas where the resort already ranks among the top competitors. By enhancing these features, Big Mountain can further solidify its position in the market and potentially attract more visitors.