Project 4 - Greece Travel Insights

By: Reinforcement Learning Rockstars

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Introduction

- Retrieved our dataset from Kaggle
- Project focused on analyzing Greek tourism insights
- Some of our topics of discovery were:
  - Best times to travel to Greece
  - What type of accommodation people used when travelling
  - Exploring relationships between cost and accommodation, date of travel and length of stay

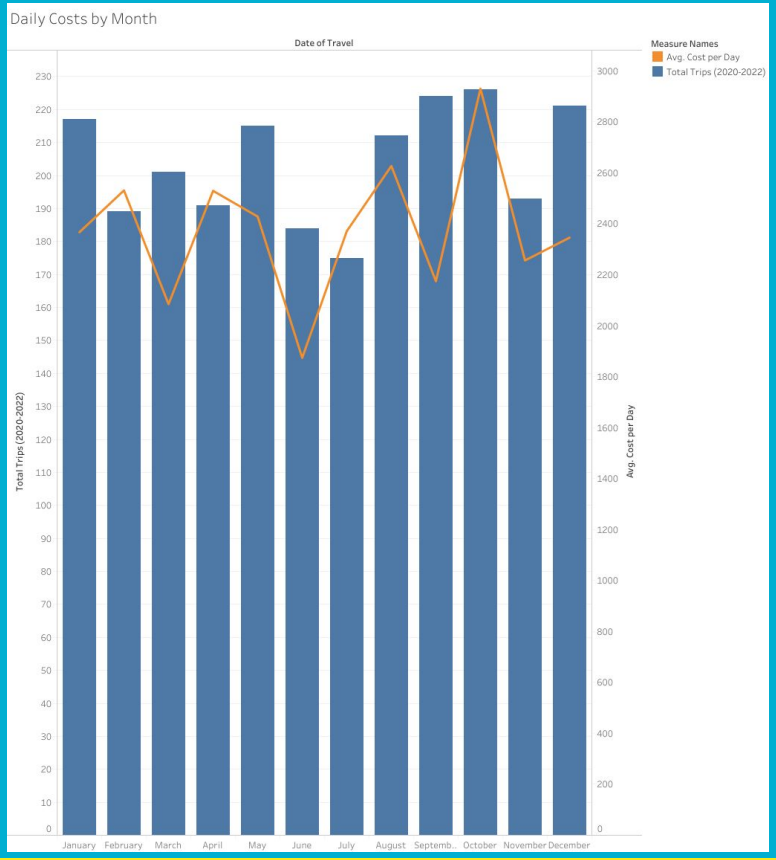
Data Source and Limitations

- Greek tourism data from Kaggle
  - Data from January 2020 - August 2023
  - 3,000 rows, 13 columns
- Mix of authentic and synthetic data.
- Data source did not specify a currency in the documentation
  - We assumed cost in Euros
- Cost column varies wildly
  - Examples:
    - 28 day trip costing 5,032
    - 1 day trip costing 29,909

What are the best months to travel to Greece?

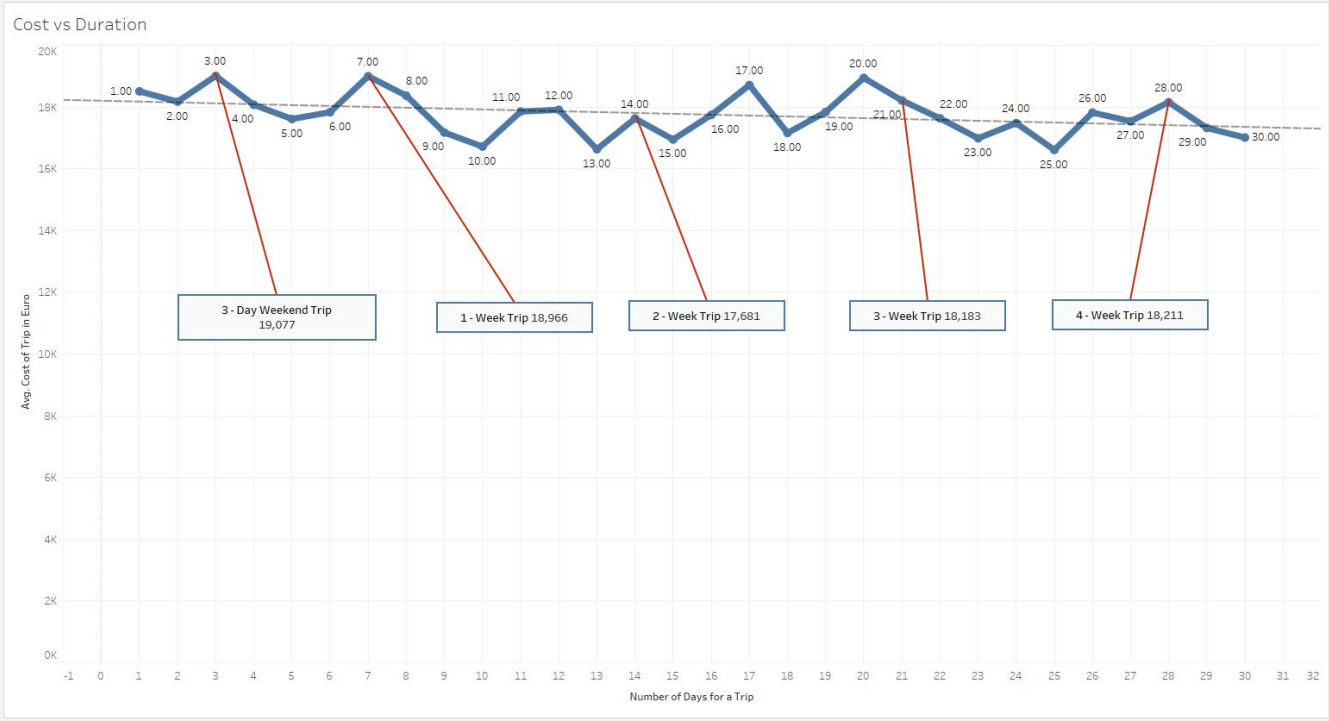
- Most Affordable:
  - June
  - March
  - September
- Smallest Crowds:
  - July
  - June
  - February

- Best Overall: June
- Worst Overall: October



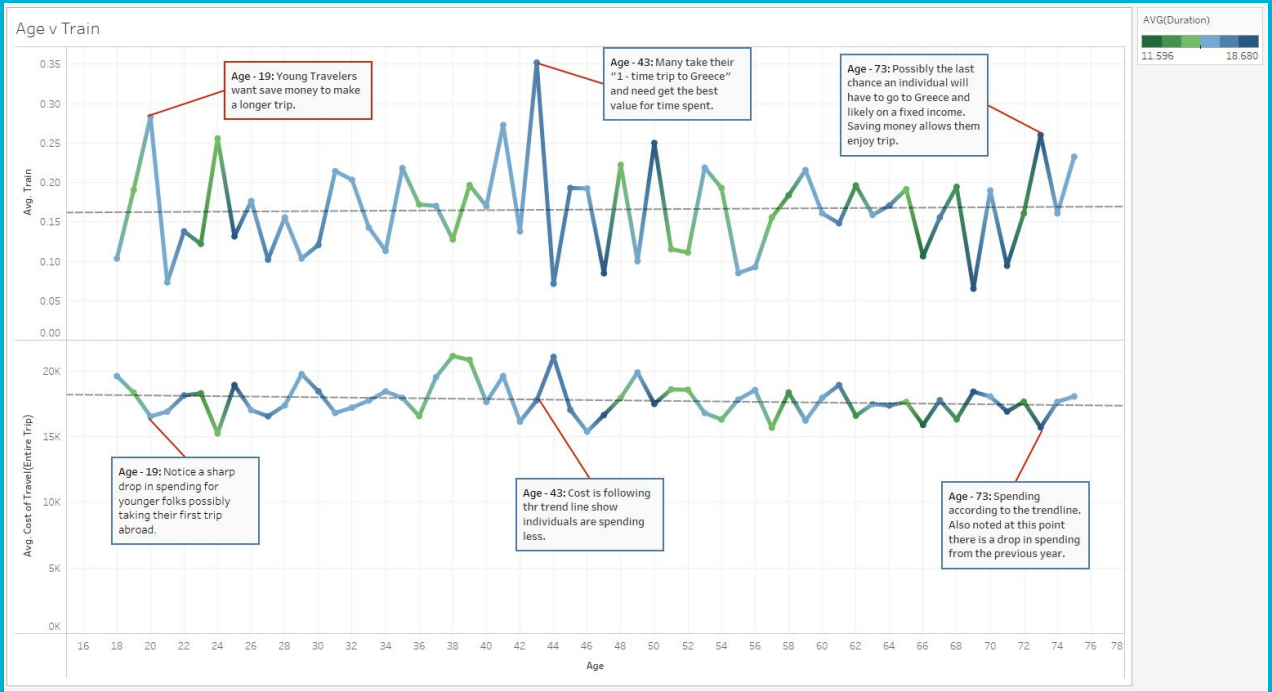
Andrew Insights

Cost of a Trip vs Number of Days for a Trip



Andrew Insights

Age vs Traveling by Train with Respect to Duration of Trip



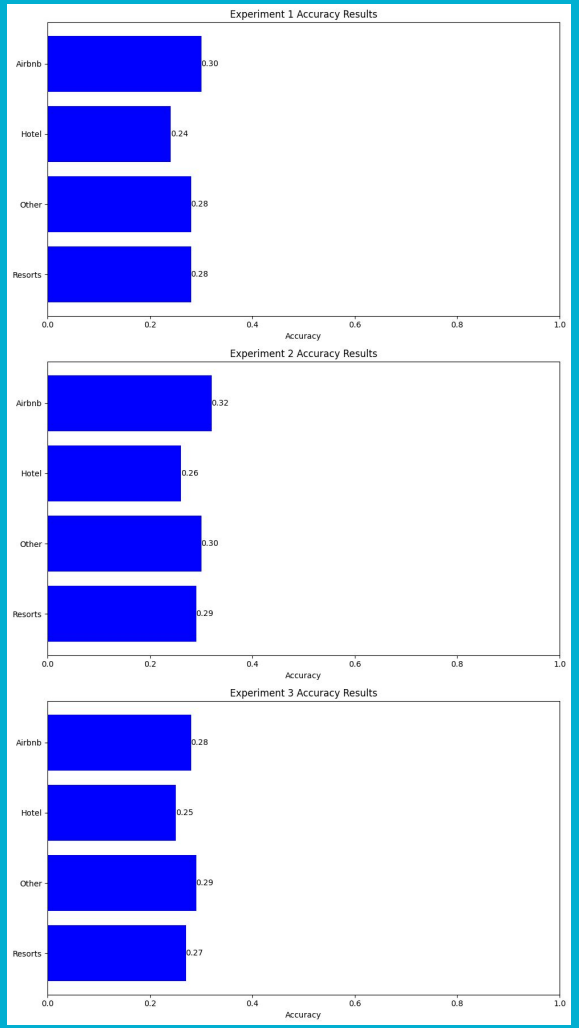
Machine Learning

Type of Accommodation:

- We created a Logistic Regression model focused on the ‘type of stay’ that tourists used most often.
- Ran 3 models:
  - 500 iterations
  - 750 iterations
  - 1,000 iterations
- Accuracy of the model with 1,000 iterations was the strongest, at 27%

Machine Learning - Visuals

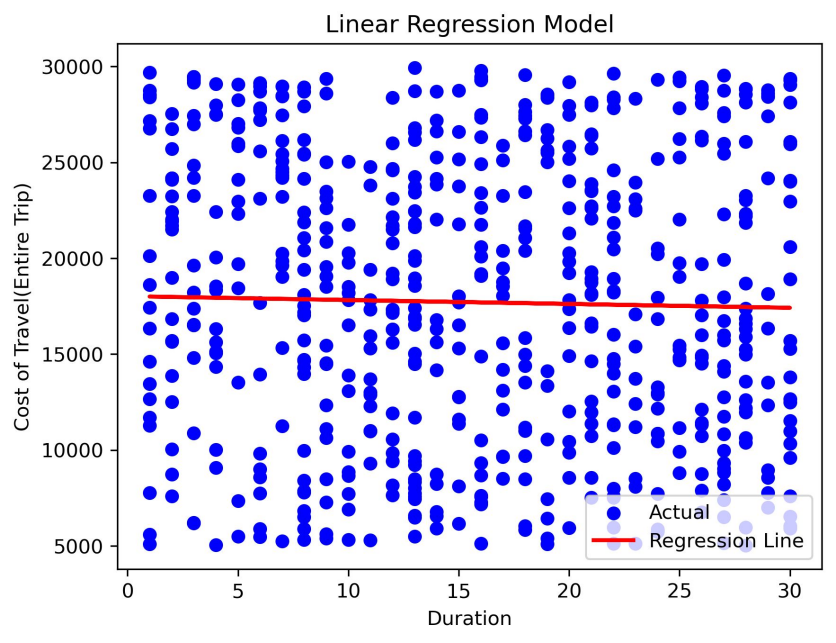
- Using Matplotlib, we created visual representations of the 3 trials.
- Airbnb had the best overall accuracy scores, with an average accuracy percentage of 30% between the 3 models.



Machine Learning (2)

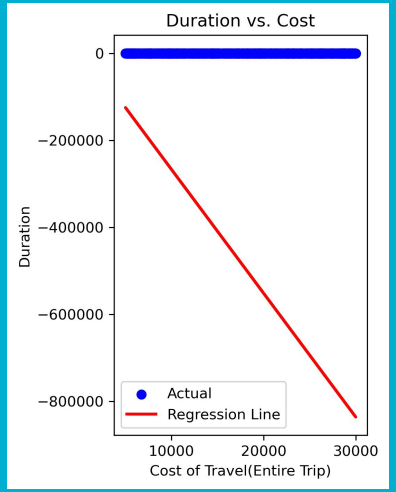
Duration of the Stay and Total Cost.

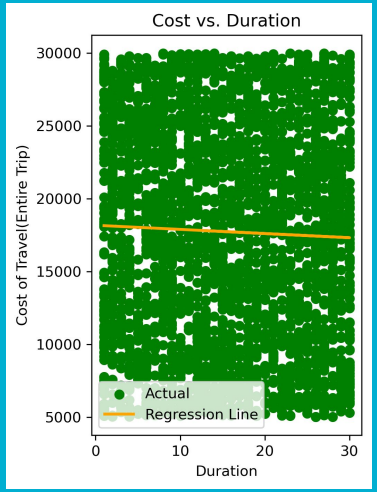
- We created a Logistic Regression model focused on the ‘Duration of the Stay’.
- Ran several models. Accuracy of the model:
  - Default: 38%
  - 500 iterations: 55 %
  - 750 iterations: 55%
  - 1,000 iterations: 62%
  - 2,000 iterations: 79%
- Accuracy of the model with 2,000 iterations was the strongest, at 79%



Machine Learning (2)

- 2 Regression models to predict:
  - Duration of Stay based on Cost
  -
  - Cost based on Duration of Stay
    - Input: Number of days
    - Output: Cost





Limitation:

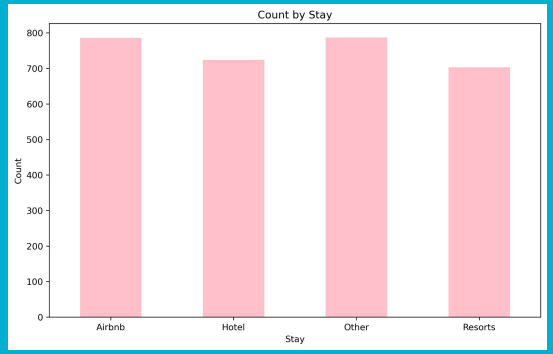
- Uniform dataset due to synthetic data.
- Problems when making predictions.

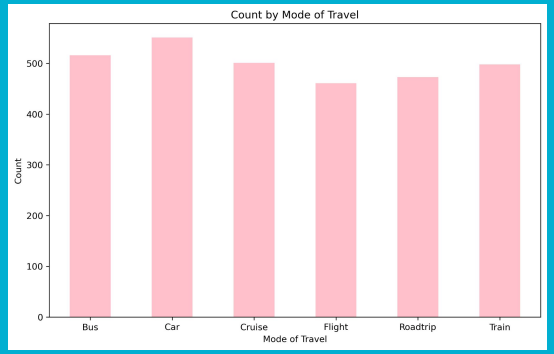
```
# Predict the cost for a 25-day stay
predicted_cost = cost_model.predict(duration_input)

print(f"Predicted Cost for a 25-day stay: ${predicted_cost[0]:.2f}")
```

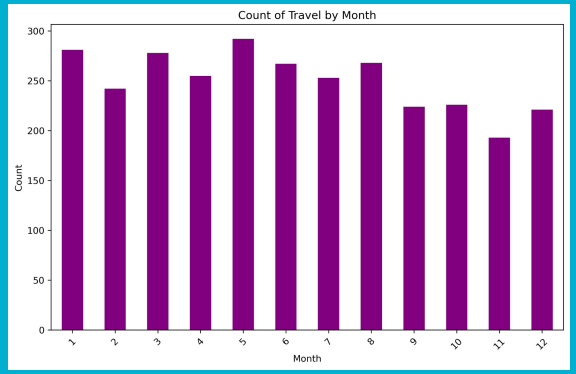
```
Predicted Cost for a 25-day stay: $17475.93
Predicted Cost for a 10-day stay: $17903.16
```

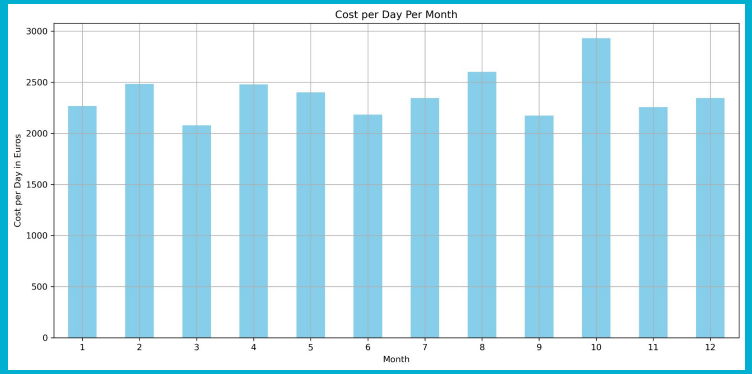
ML Insights

Exploring the dataset and finding limitations due to synthetic data.









Conclusion

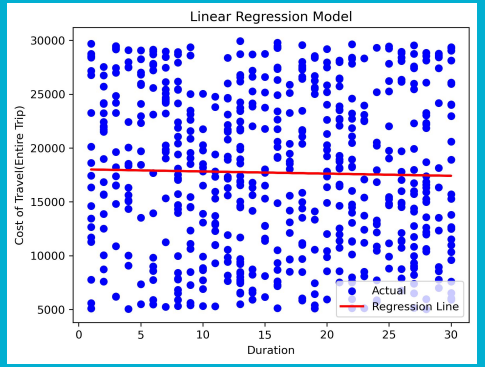
- Best month to travel: June
- Dataset was not very conducive to accurate machine learning models.
    - May be due to inclusion of synthetic data

Our Analysis shows a Linear Regression Model is not optimal for the following reasons:

- The Variance is too high, data is perfectly space with very little clustering,

  not enough data close to the mean.

- The R2 (coefficient of determination) is incredibly low.



Thank You!