Guided Capstone Project Report: Big Mountain Resort

Problem Statement

The project aimed to optimize the pricing strategy for Big Mountain Resort by analyzing various factors influencing ticket prices at ski resorts. The goal is to develop a pricing model that maximizes revenue while remaining competitive in the market.

Data Wrangling

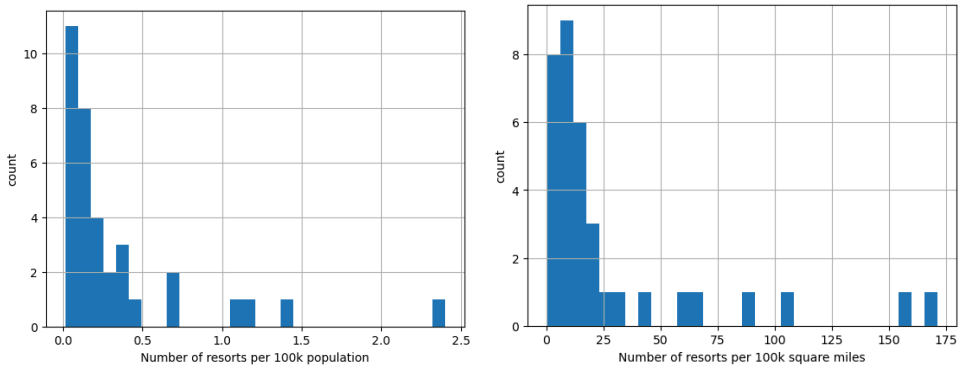
The initial phase involved loading the data and extracting specific data related to Big Mountain Resort. This step was crucial to clean and prepare the data for further analysis. The data set initially contained several features, including ticket prices, resort statistics, and geographical information. The wrangling process involved:

- Handling missing values and removing features with excessive missing data.
- Dropping redundant features and transforming others for better analysis.

Exploratory Data Analysis (EDA)

A thorough EDA was conducted to understand the data's characteristics. This step was crucial in identifying trends, patterns, and anomalies in the data, which informed subsequent modeling decisions. Key insights from the EDA include:

- The distribution of ticket prices across different resorts and regions.
- Correlations between resort features (e.g., size, facilities) and ticket prices.



Model Preprocessing with Feature Engineering

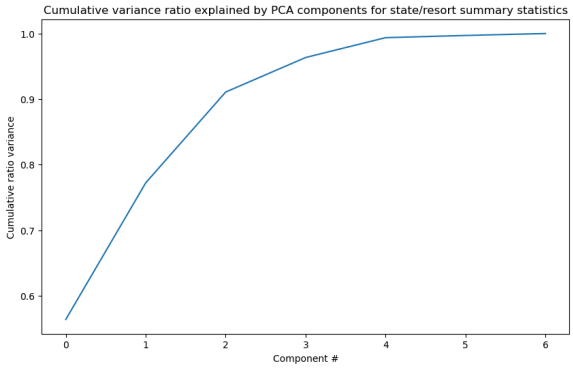
Preprocessing involved handling missing values and scaling the data. Two approaches were used for imputing missing values: using the median and mean values from the training set. This step was crucial for preparing the dataset for effective modeling.

- Categorical variables were encoded, and numerical features were scaled.
- New features were created to capture complex relationships within the data.

Algorithms and Evaluation Metrics

The project experimented with various models, including linear regression and random forest regression. The performance of these models was assessed using metrics like R-squared, Mean Absolute Error (MAE), and Mean Squared Error (MSE).

- Multiple models, including Linear Regression and Random Forest, were evaluated.
- The models were assessed using metrics like Mean Absolute Error (MAE) and R-squared values.



Winning Model and Scenario Modeling

The final model selection was based on the performance metrics. The chosen model best predicted ticket prices based on the features of the resort. Scenario modeling was also conducted to understand how changes in features could impact ticket prices.

- The Random Forest model was selected for its superior performance and ability to capture non-linear relationships.
- Scenario modeling demonstrated how changes in resort features might impact ticket prices.

Pricing Recommendation

Based on the model's insights, a pricing strategy was recommended that aligns with the resort's features and market position. This strategy aims to optimize revenue while maintaining competitiveness.

- Based on the model, it's recommended that Big Mountain Resort increases its weekend ticket prices slightly, as the model indicates a higher potential price point.
- This increase should be gradual to gauge customer response.

Conclusion

The analysis suggests that Big Mountain Resort can optimize ticket pricing by considering various features and market conditions. The selected model provides a robust framework for making data-driven pricing decisions. Big Mountain Resort has room to increase ticket prices without impacting competitiveness. This strategy should be implemented alongside continual market monitoring.

Future Scope of Work

Future work could explore more complex models and incorporate additional data sources for more nuanced insights. Also, regularly updating the model with new data will ensure the recommendations stay relevant.

- Further refinement of the model with more granular data (e.g., customer demographics).
- Regular updates to the model to incorporate new market trends and data.