

Dynamic Pricing for Urban Parking

1. Introduction

This project showcases how to work with parking occupancy data to design pricing strategies. It uses a simplified dataset focused on one parking spot.

2. Dataset Description

The dataset includes fields like Occupancy, Vehicle Type, Traffic Condition, Queue Length, and timestamps. It captures real-world usage trends for parking infrastructure.

3. Exploratory Data Analysis

Initial data analysis explores the correlation between occupancy and factors like vehicle type and traffic conditions. The aim is to understand usage behavior and identify peak periods.

4. Visualization

The following visualizations were created to support exploratory analysis and guide pricing strategies.

[Graph: Occupancy by Vehicle Type]

[Graph: Occupancy by Traffic Condition]

5. Modeling and Pricing Insights

A simple rule-based pricing model was tested. However, this model should be improved by integrating real-time data and machine learning algorithms for accurate demand-based pricing.

6. Conclusion

This report lays the foundation for dynamic pricing in smart parking systems. Further improvements could include predictive analytics, time-series modeling, and real-time traffic integration.