

Dynamic Pricing for Parking - Summer Analytics 2025

This repository contains two models that simulate dynamic pricing mechanisms for parking spaces using data-driven strategies.

Files Included

File Name	Description
Model1DynamicPricingProject.ipynb	Streaming-based price modeling using Pathway
Model2DynamicPricing_Final.ipynb	Linear-based batch model for demand + price
dataset.csv	Dataset used in both models

Tech Stack Used

- Python
 - Google Colab
 - Pandas
 - Pathway
 - Bokeh
 - Panel
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Project Overview

- **Model 1:** Uses real-time streaming via Pathway to aggregate occupancy and calculate dynamic pricing.
 - **Model 2:** Uses a linear formula for demand estimation followed by price computation.
 - Both models visualize final price using interactive Bokeh plots.
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Architecture Diagram

You can copy this diagram into [Mermaid Live Editor](#) for better visualization.

```
graph TD
  A[dataset.csv] --> B[Data Preprocessing (Combine Date & Time)]
  B --> C[Feature Engineering (Traffic Encoding, VehicleType Mapping)]
  C --> D[Model 1 (Streaming: Pathway)]
  C --> E[Model 2 (Batch Linear Model)]
  D --> F[Final Price (Streamed)]
  E --> G[Final Price (Batch)]
  F --> H[Bokeh Visualization]
  G --> H
```

Repository Structure

```
. ├── Model1_Dynamic_Pricing_Project.ipynb ├──  
Model_2_Dynamic_Pricing_Final.ipynb ├── dataset.csv └── README.md
```

How to Use

1. Clone the repository or open notebooks in Google Colab.
 2. Ensure `dataset.csv` is present in the same directory.
 3. Run each notebook step by step to visualize the pricing model.
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Contact

For any queries, raise an issue or contact [Your GitHub Username].