Data, at Your Service

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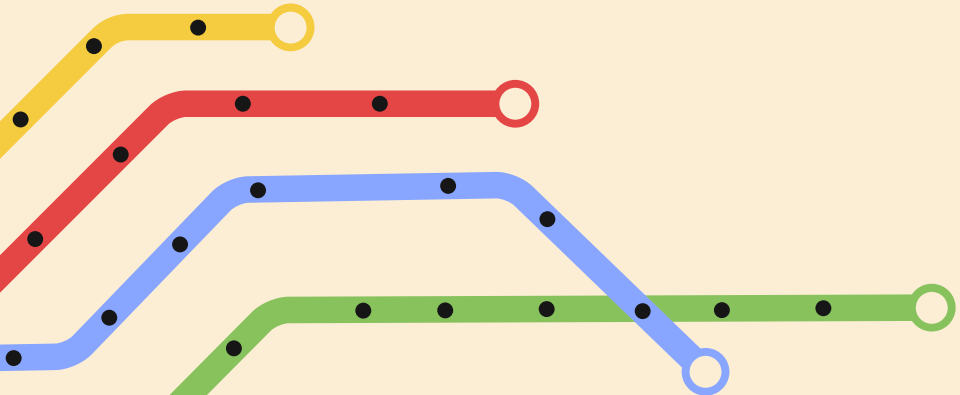
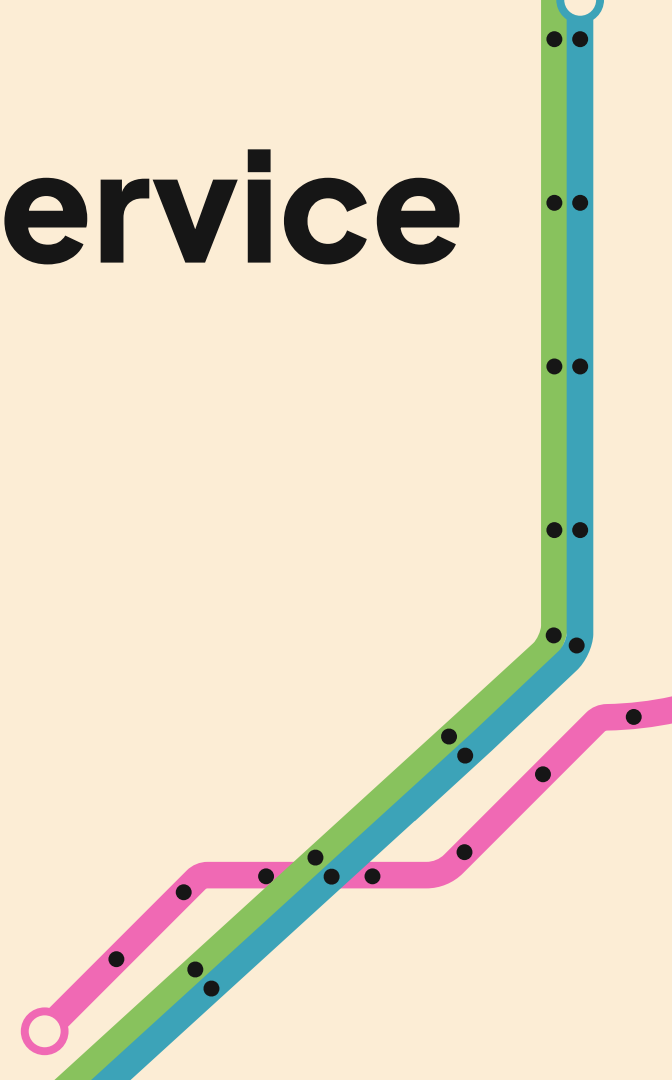




Project MTA Roadmap

01

Introduction

Goal: Smooth subway traffic and reduce congestion on peak hours

02

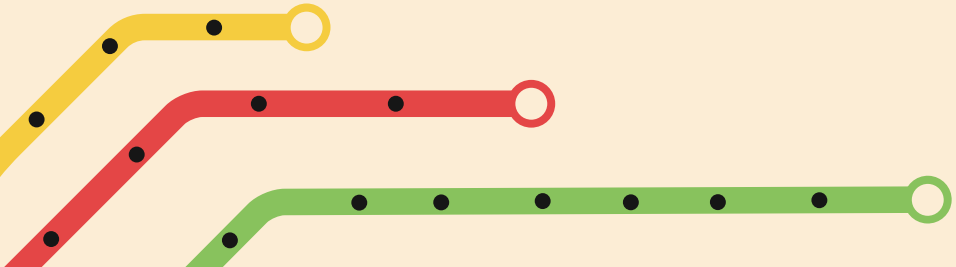
EDA & ML

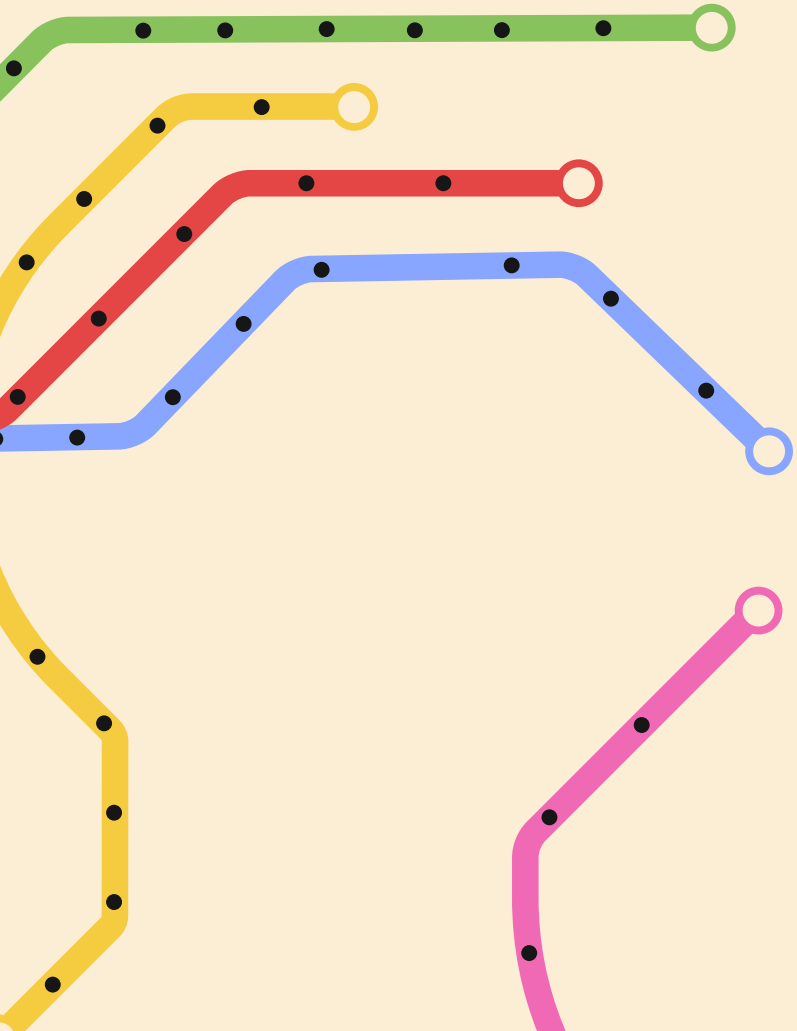
- streamlit

03

Dynamic Pricing

04 Future Research & Limitations

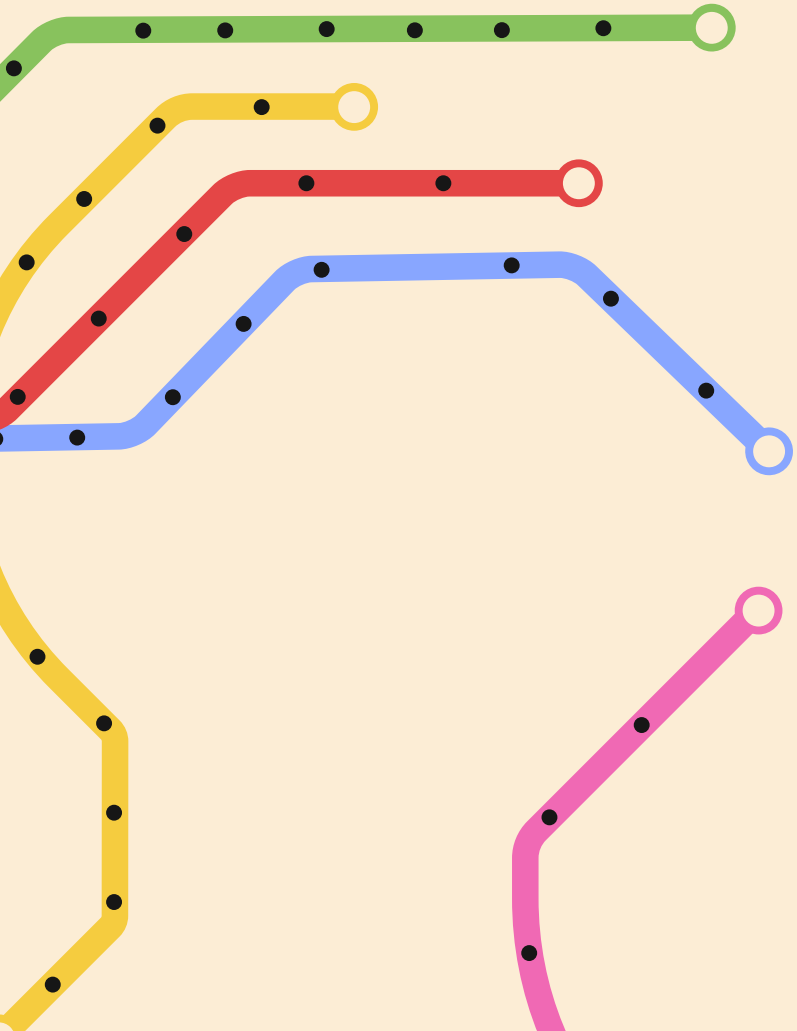




02

EDA & ML

Streamlit with Jerry



03

Dynamic Pricing

Model FlowChart

Input Data

ML model Predictions

Real time Component

Ridership Prediction

Real-Time Event data

eventbrite

API depreciated

1500 requests/mo

Real-Time Traffic Data

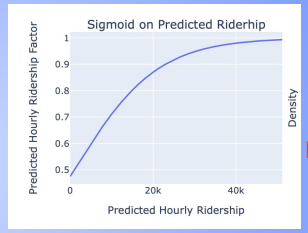
Under development

Real-Time Complaints

Dataset availability

Sigmoid adjustment

allows for smooth transition of fare prices between a lower and upper bound.

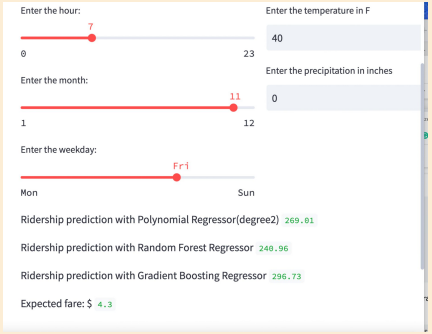


Cluster pricing to avoid Arbitrage

- Distance
- Ridership

-> Cluster Factor

Dynamic Pricing



Better Predictions

LSTM

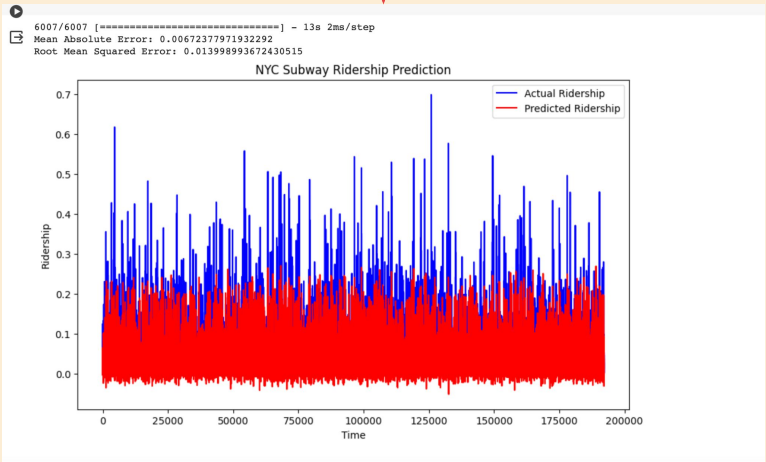
Long Short-Term Memory **recurrent neural network (RNN) architecture**

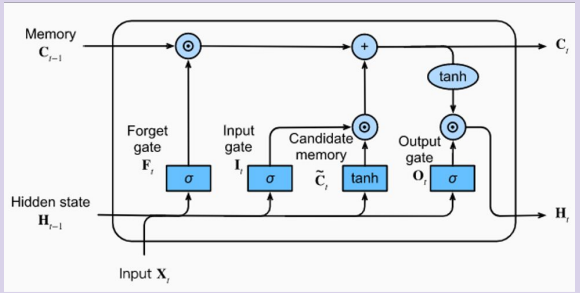
Station-Wide Model

```
# Build the LSTM model
model = Sequential()
model.add(LSTM(50, activation='relu', input_shape=(1, len(features))))
model.add(Dense(1))
model.compile(optimizer='adam', loss='mean_squared_error', metrics=[MeanAbsoluteError()])

# Train the model
model.fit(X_train_array, y_train, epochs=20, batch_size=32, validation_data=(X_test_array, y_test), verbose=1)

# Save the model
model.save('subway_ridership_model.h5')
```

```
WARNING:tensorflow:Layer lstm_2 will not use cuDNN kernels since it doesn't meet the criteria. It will use a
generic GPU kernel as fallback when running on GPU.
Epoch 1/20
```

```
6007/6007 [==============================] - 13s 2ms/step
Mean Absolute Error: 0.00672377971932292
Root Mean Squared Error: 0.013998993672430515
```

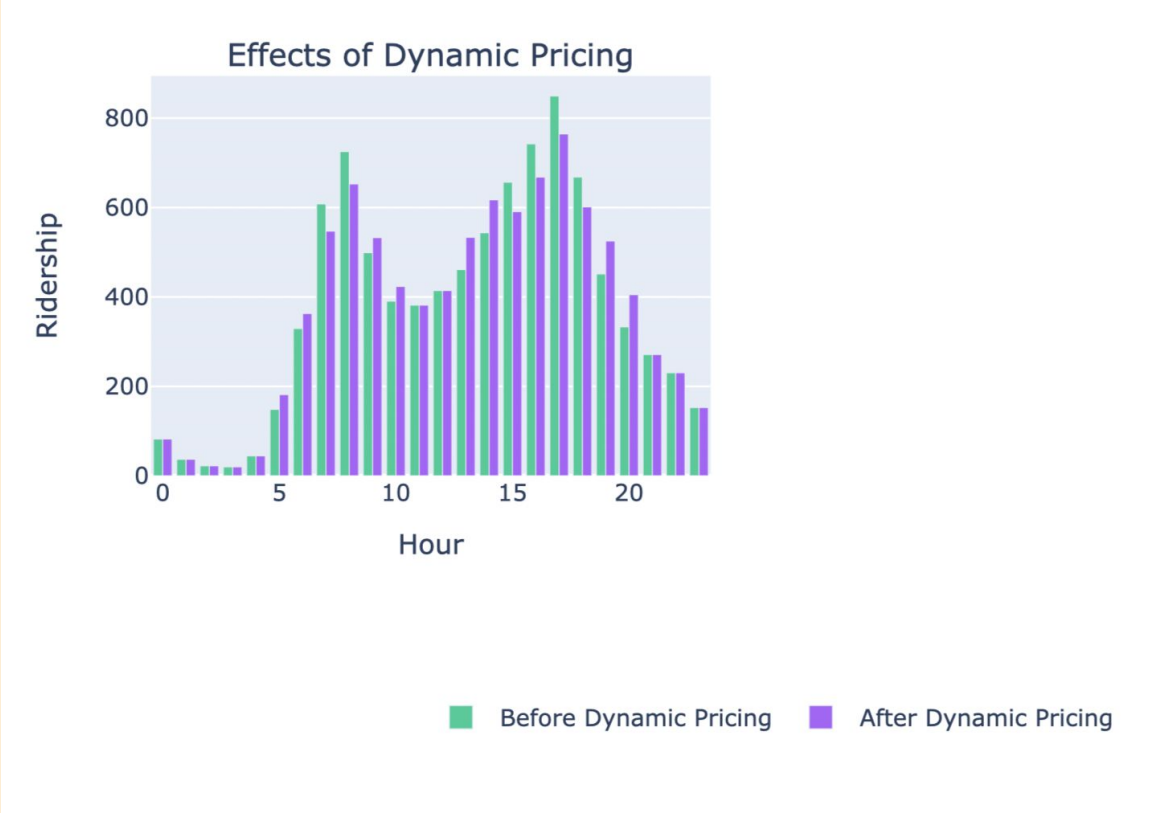




a cell, an input gate, an output gate and a forget gate.

The cell remembers values over arbitrary time intervals and the three gates regulate the flow of information into and out of the cell.

Results on Congestion Reduction



Thanks!

Do you have any questions?

https://github.com/jchen056/MTA_MTA