

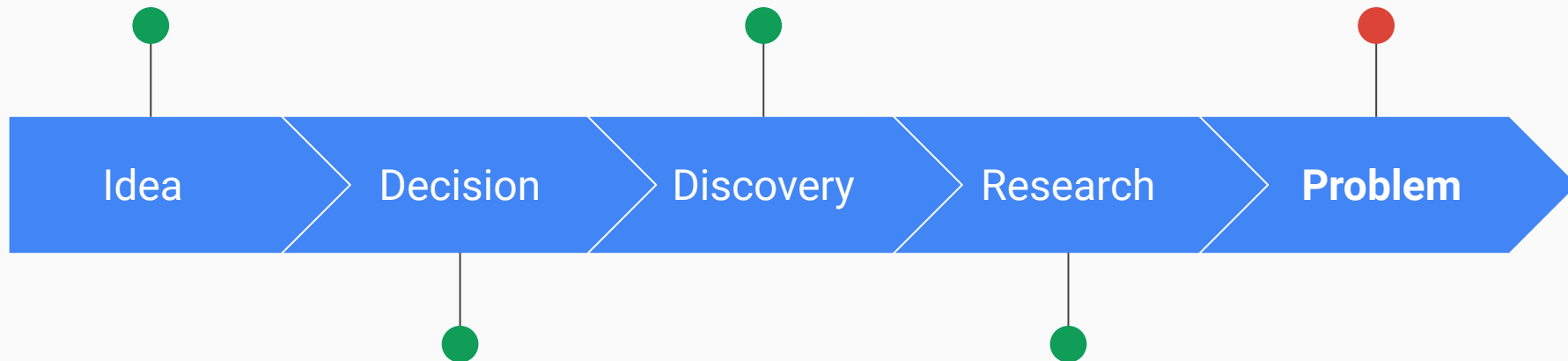
Citi Bike Predictor: Planning Your Bike-Friendly Visit to NYC

Brian Lewis
June 7, 2021

You decide you want to plan a trip to the Big Apple

Wow! NYC has a bike-sharing program called Citi Bike

But how do I know what bike inventory will be when I visit?



After seeing car rental and taxi prices, you decide you want to bicycle through the city

And they have a map of all the stations with real-time bike inventory!

Link to Live App



[Citi Bike Predictor App](#)

Data: Stations + Trips

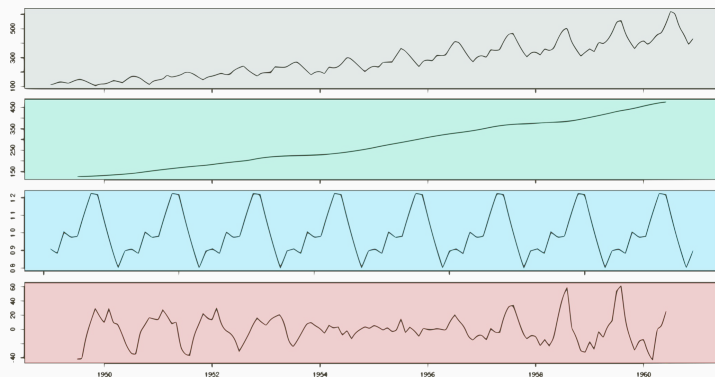
Bike Stations:

- [City of New York .json feed](#)
- 509 locations included
- Relevant Variables:
 - Station_id
 - Name
 - Latitude
 - Longitude
 - Capacity (Total Bike Docks)

Bike Trips:

- [Citi Bike \(Lyft\) S3 Bucket](#)
- March 2020 - March 2021
- Relevant Variables:
 - Timestamp
 - Departure_station_id
 - Arrival_station_id

ARIMA



MAPE

$$MAPE = \frac{100\%}{n} \sum \left| \frac{y - \hat{y}}{y} \right|$$

\hat{y} is smaller than the actual value

$n = 1 \quad \hat{y} = 10 \quad y = 20$

MAPE = 50%

\hat{y} is greater than the actual value

$n = 1 \quad \hat{y} = 20 \quad y = 10$

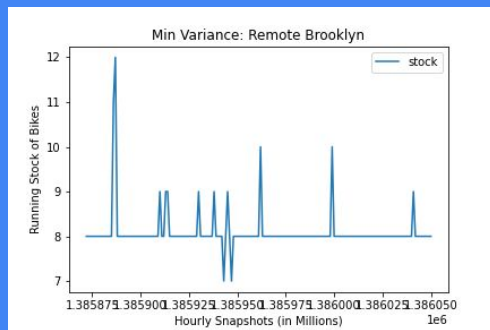
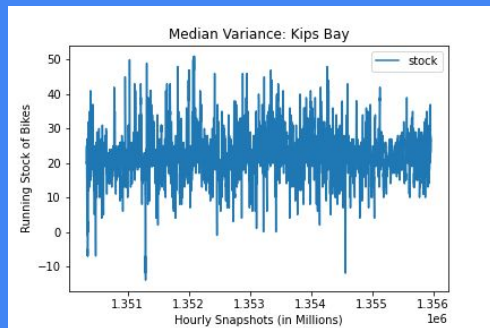
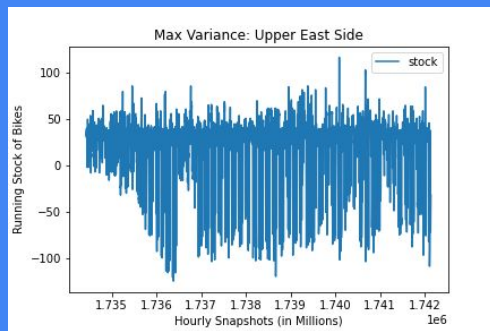
MAPE = 100%

ARIMA: Auto Regressive Integrated Moving Average

- Regresses a time series variable on past values of itself and integrates seasonality components

MAPE: Mean Absolute Percentage Error

- Measures accuracy as a percentage and incorporates absolute differences
- Success: $\leq 15\%$ MAPE



- Hundreds of bikes “drain” from Upper West and Upper East side locations, requiring *rebalancing*



- Remote Brooklyn has some “wishful thinking” locations

Thank you!

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