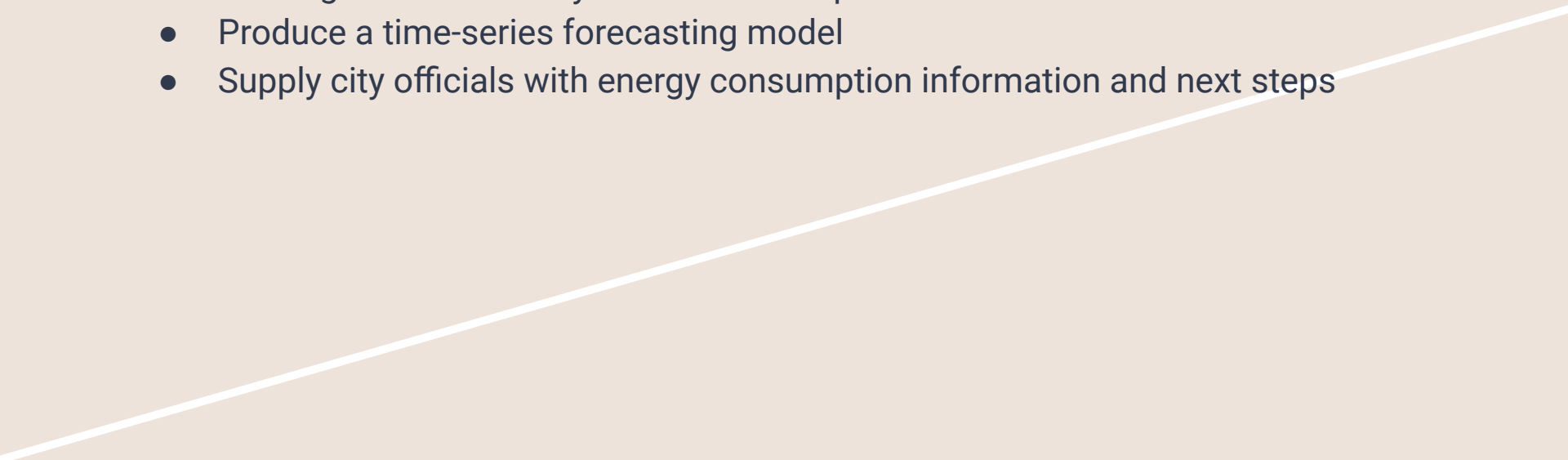


Power Consumption Modeling

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Goals

- Investigate Tetouan City Power Consumption dataset
 - Produce a time-series forecasting model
 - Supply city officials with energy consumption information and next steps
- 

Data Understanding

About the Data

- 52,416 rows
- 9 columns
- Recordings every 10 minutes
- Date Range: January 1st, 2017 → December 30th 2017

Two versions of the dataset were used

1. Data recorded every 10 minutes
2. Data recorded every 1 hour

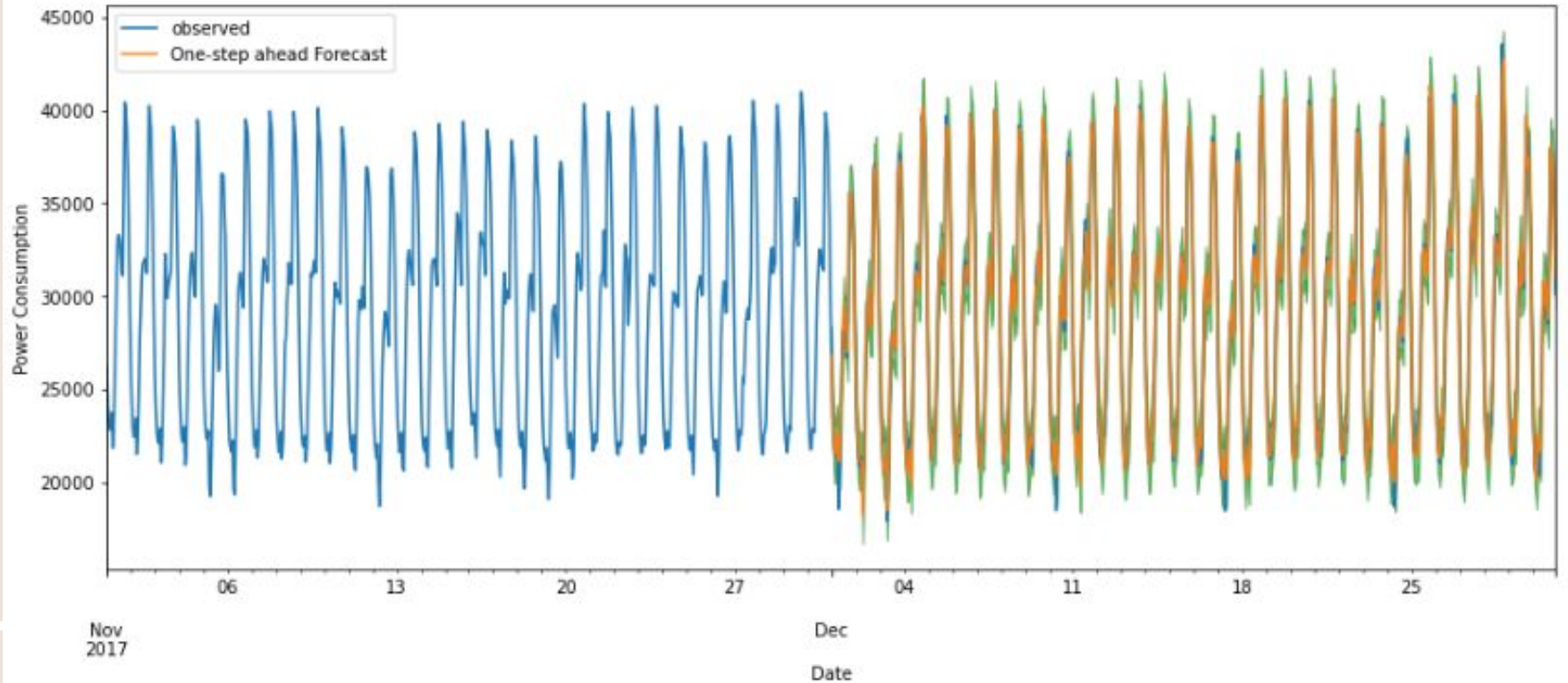
Modeling and Evaluation

- Evaluation metric is Mean Squared Error
- Non Time series Models achieved between 4000 and 7000 MSE
- Time Series Models Achieved as low as 562.02 MSE

Final Model to be deployed is a SARIMA model trained on an hourly aggregate of the data

Insert Plot of MSE of time series and baseline top 3

Forecasting



How to Improve?

Model Performance

- The SARIMA model was incredibly successful
- SARIMA model predicts within 3% of the observed value

Improvements?

- Additional Predictors
- Population / Demographic Information

Recommendations and Next Steps

1. **Temperature Relationship** - Temperature is the most correlated predictor outside of the time series itself. Logically this makes sense, air conditioning and heating usage rise and fall with temperature changes. Consider adding support to energy production centers during intense weather periods like summer and winter.
2. **Forecasting** - SARIMA models worked exceptionally well with this data because of its seasonal aspects, when considering using forecasting for consumption predictions in the future to avoid lack of resources
3. **Further Research into population and demographics** - I think it's important that work is always further built upon. In particular, power consumption will likely go up population, adding population data will go us a correlation between the two. Adding categorical data such as whether the zone in question is residential, commercial, or industrial can also tell us a lot about how different areas are used and how that impacts power consumption

Contact Information

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