Predicting NYC Hourly Load

Time Series Forecasting and Analysis: Data Science

Orlando Vilar, May 2023

Introduction

Introduction
Overview & Business Understanding

- Hourly Load in NYC;

  - Proper grid coordination;

- **Solution**: forecasting framework;

- **Relevance**:

  - NYC electricity supply and demand.

Data & Analysis

Data Understanding
Sources of Information

- Databases:

  - New York Independent System Operator (NYISO) dataset;

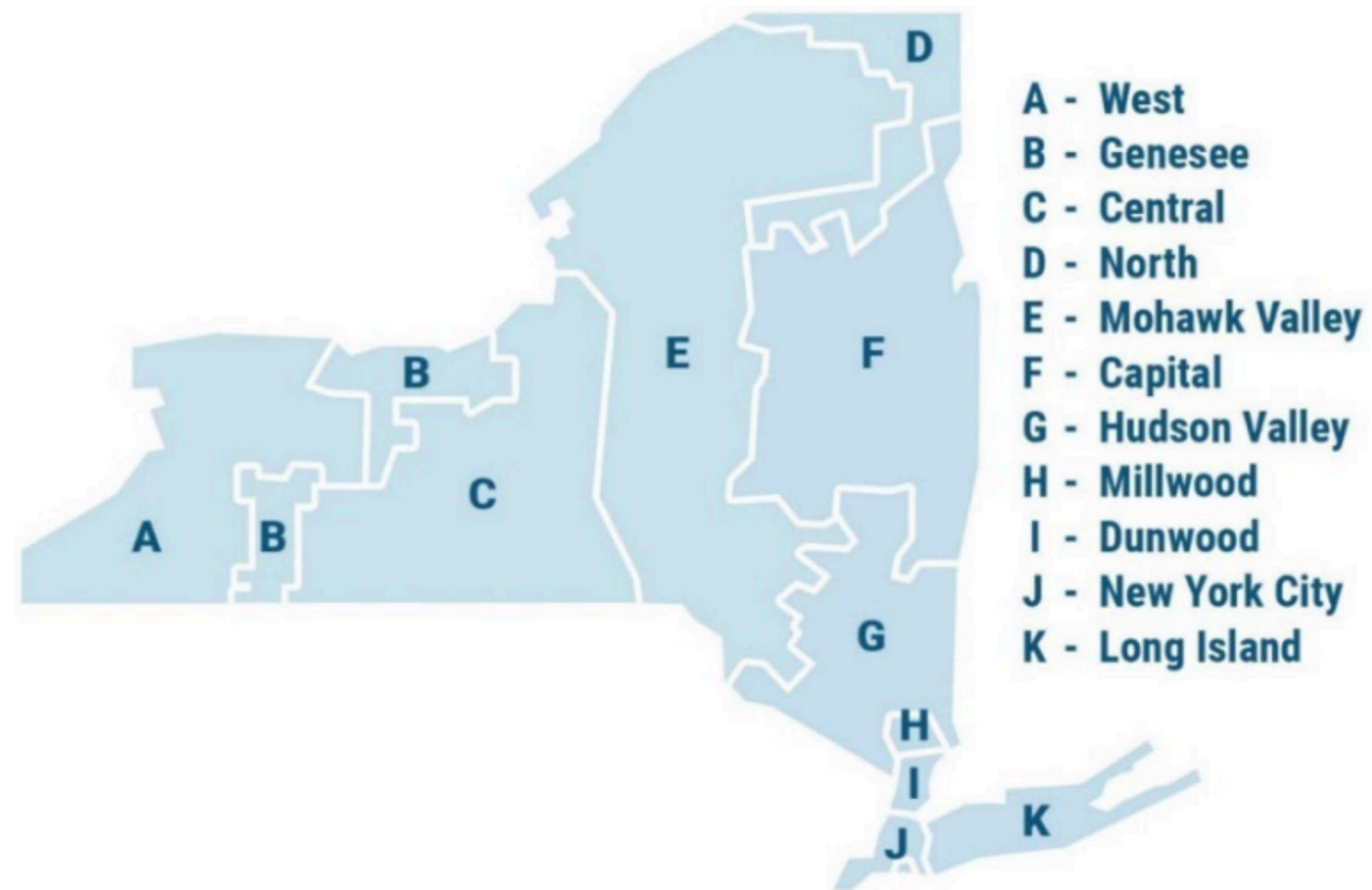   - New York City, 2018 - 2020;

      - 319,938 obs.

Data Understanding
Sources of Information

- Variables:

  - Load, Region, Holiday, Peak and Off-Peak;

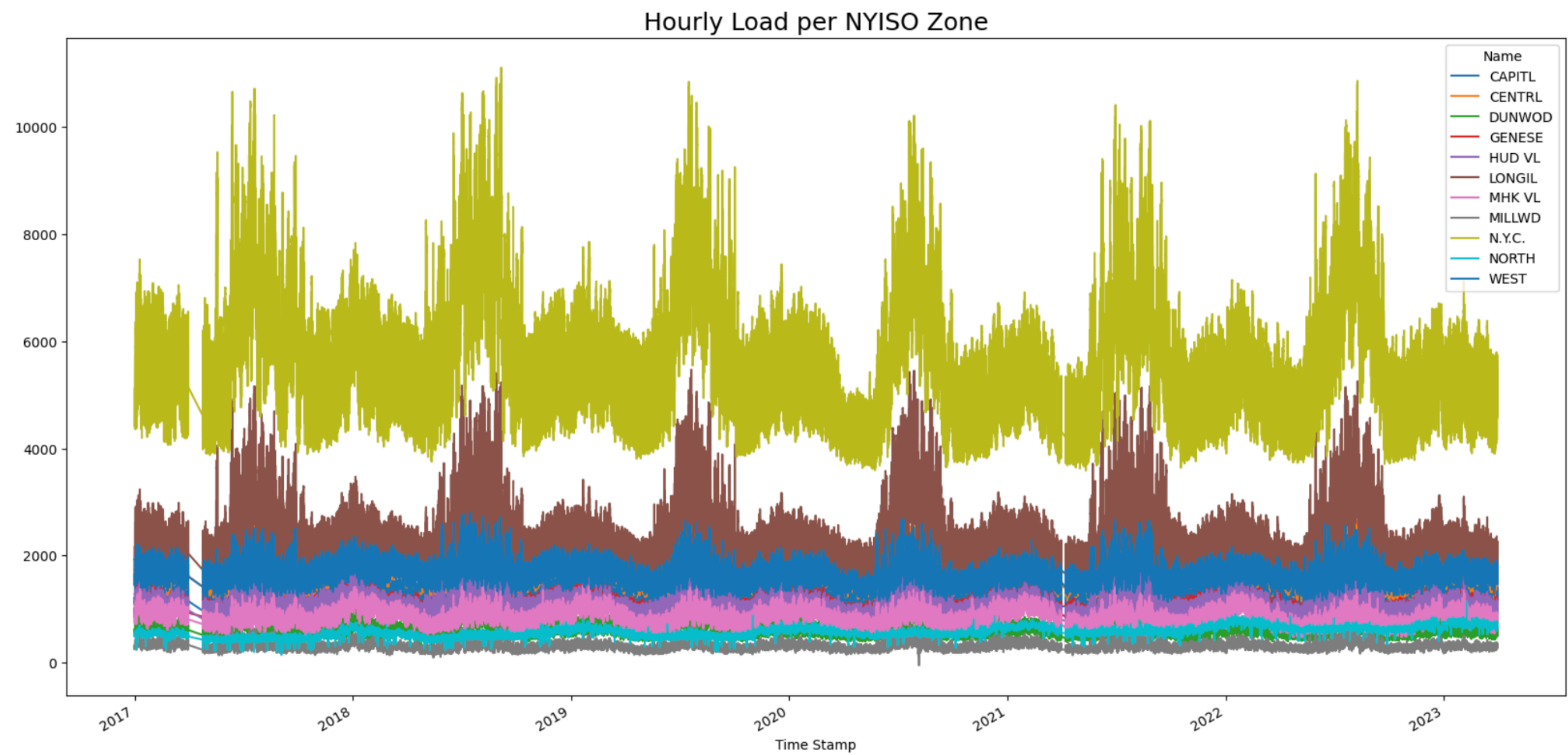- Additional feature:

  - Weather statistics.
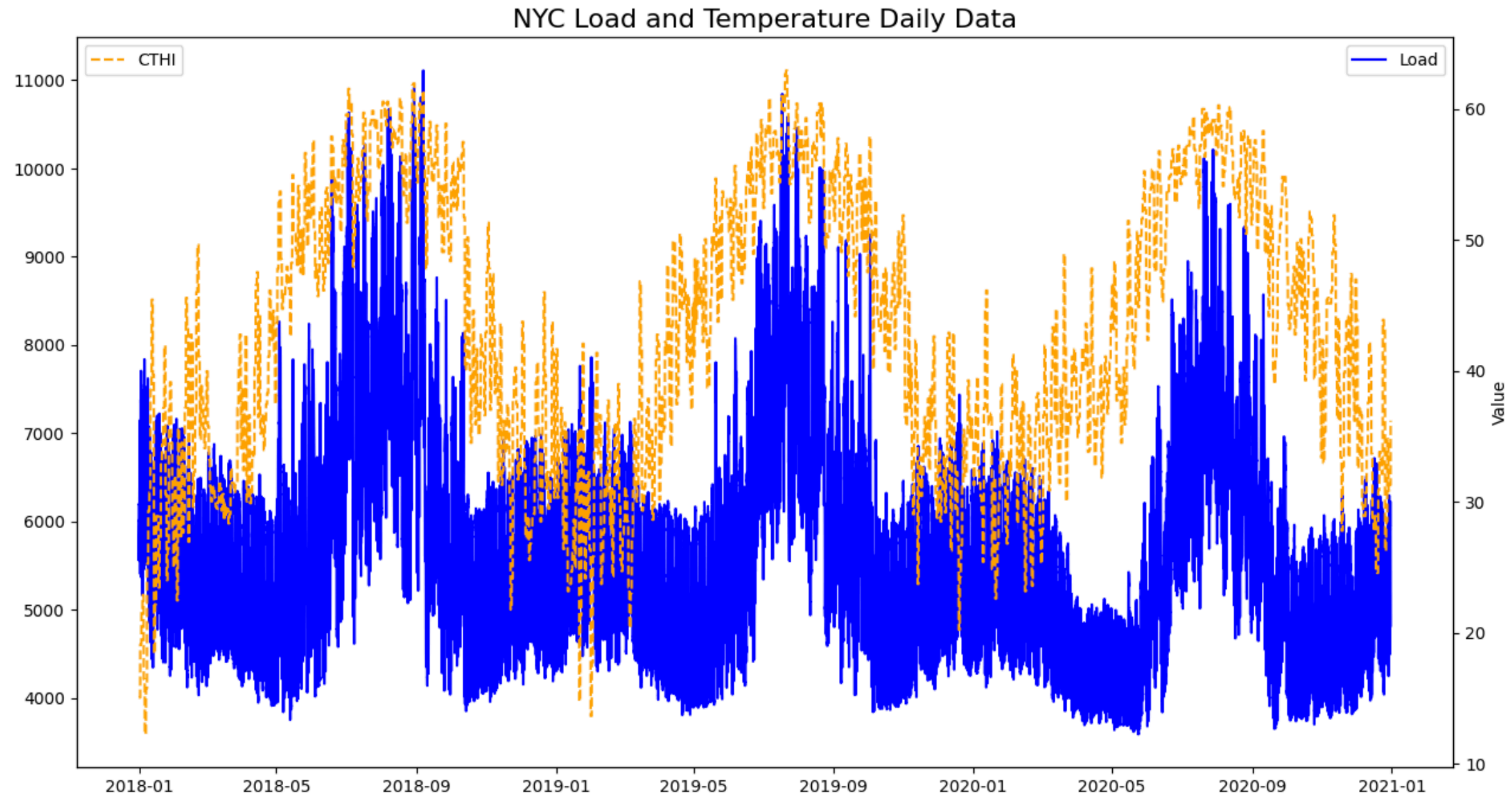
NYISO Load Zone Map
New York City (Zone J)

A - West
B - Genesee
C - Central
D - North
E - Mohawk Valley
F - Capital
G - Hudson Valley
H - Millwood
I - Dunwood
J - New York City
K - Long Island

NYISO Load Zone Map
New York City (Zone J) - 33% of total load

Hourly Load per NYISO Zone

NYC Hourly Load
Cumulative Temperature and Humidity Index
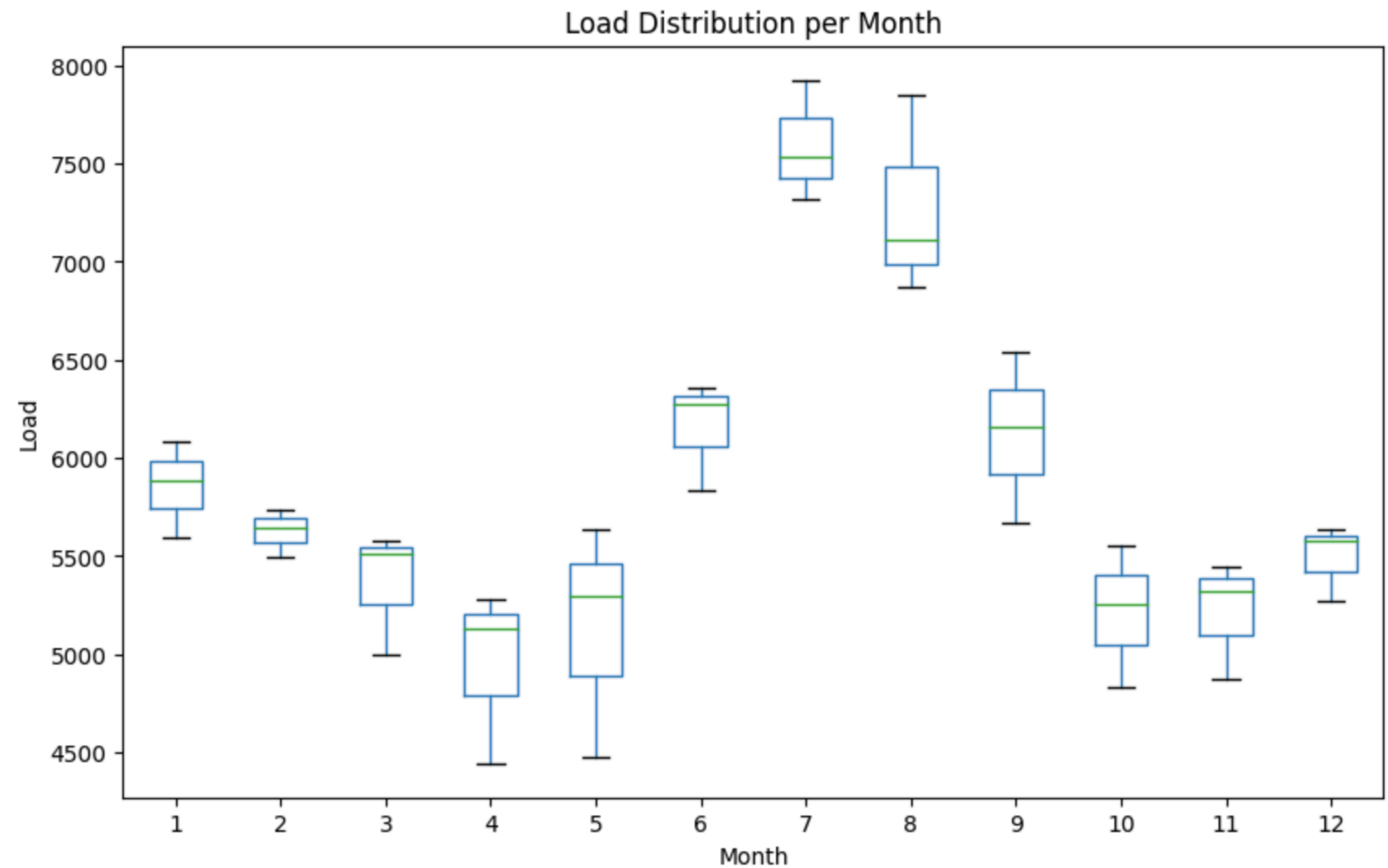

NYC Load and Temperature Daily Data

Closing Remarks

Strategies

Three key insights

- **Peak Forecasting:** simple LSTM;

- **Trough Forecasting:** fully saturated Prophet;

- **Ensemble**: LSTM + Prophet.

Load Distribution per Month

Limitations
Further analysis

- Hourly weather data;

- Generation/transmission data;

- Computational power.

Thank you!

https://github.com/ovilar