

Assignment

About

Load Forecasting refers to the process of predicting future electricity load consumption, from historical data. It involves forecasting average load in MW or total load in MWh for blocks of 15', 30', hour, day, week, month or year for a daily forecast, weekly forecast, monthly forecast, yearly or multi year forecast. It helps an electric utility to make important decisions including decisions on purchasing and generating electric power, load switching, and infrastructure development. Load forecasts are extremely important for energy suppliers, ISOs, financial institutions, and other participants in electric energy generation, transmission, distribution, and markets. Various factors can also be taken into consideration while forecasting, for instance, weather conditions can be sent as an input in the mathematical foreteller function to improve accuracy parameters in certain scenarios.

Problem Statement

The actual load demand data of a northern Indian state, along with the weather conditions is provided for three subsequent years.

- **Task 1** - Do a short term forecast for the day 14 December 2020 in the frequency of 15 minutes.
- **Task 2** - Do forecast for the rows where load values are NaN.

Hints

- **Rainfall Effects**
Rainfall is expressed in inches or centimeters of water. Precipitation can affect load consumption directly as well as indirectly.
- **Festivals & National Events Effects**
Load is affected by such factors as deviations depend on mass psychology on that particular day.

Submission

Candidate is required to submit the following-

- A .csv file containing forecast values of both tasks. Columns will be "datetime" and "forecast". Datetime should be in ascending order.
- Code notebook (.ipynb file). Add comments and documentation wherever necessary.
- HTML file of the code.
- Synopsis including explanation of the approach, insights and conclusions. Hence, an overall summary.

Judgement Criteria

- Insights one has dug out of the data and how those insights have assisted in model selection and outcoming results.
- Mean Absolute Percentage Error (MAPE) values. It is calculated as

$$MAPE = [abs(actual_values - forecast_values) / actual_values]*100$$

- Explanation of the thought process and results in the Synopsis.