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Time Series Challenge

## **Forecasting Household Power Consumption**

#### ***Overview of the Task***

In this challenge, you will use the Individual Household Electric Power Consumption dataset to develop a predictive model that forecasts household power consumption. The task involves analyzing the dataset, preprocessing it, and building a model capable of making accurate predictions. You will also be required to deploy their model in a functional application that can handle real-time predictions.

#### ***Problem Statement***

Your goal is to build a regression or time series model to predict future electricity consumption for a household based on historical usage data. Accurate predictions can help in managing energy consumption better, optimizing energy bills, and implementing energy-efficient measures. This challenge will test your ability to handle real-world data, apply predictive modeling techniques, and create a deployable solution.

#### ***Objective***

1. **Develop a Predictive Model:** Build a regression or time series model to forecast electricity consumption based on historical data.
2. **Deploy the Model:** Create a web application or interface where users can see the data analysis.
3. **Data Collection and Cleaning:** Preprocess the dataset by handling missing values, outliers, and any other data issues to prepare it for modeling.

#### ***Data Description***

You will use the following dataset:

* **Dataset Name:** Individual Household Electric Power Consumption
* **Features:**
  + **Date:** Date in the format (dd/mm/yyyy).
  + **Time:** Time in the format (hh:mm).
  + **Global Active Power:** Household global active power (in kilowatts).
  + **Global Reactive Power:** Household global reactive power (in kilowatts).
  + **Voltage:** Household voltage (in volts).
  + **Global Intensity:** Household global intensity (in amperes).
  + **Sub Metering 1:** Energy sub-metering 1 (in watt-hours of active energy).
  + **Sub Metering 2:** Energy sub-metering 2 (in watt-hours of active energy).
  + **Sub Metering 3:** Energy sub-metering 3 (in watt-hours of active energy).

#### **Notes**

1. (global\_active\_power\*1000/60 - sub\_metering\_1 - sub\_metering\_2 - sub\_metering\_3) represents the active energy consumed every minute (in watt hour) in the household by electrical equipment not measured in sub-meterings 1, 2 and 3.
2. All calendar timestamps are present in the dataset but for some timestamps, the measurement values are missing

#### ***Evaluation Criteria***

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| **Data Collection, Connectivity, and Cleaning** | **30%** |
| **Logic and Results** | **40%** |
| **Presentation** | **5%** |
| **Code Quality** | **5%** |
| **Deployment / Running App** | **20%** |

Good luck, and we look forward to seeing your innovative solutions!