**Project Update**

**Description:**

**Forecast of household electricity demand:**

India frequently experiences a power shortage, especially in Tier 1 and Tier 2 cities. This is primarily due to the unbalanced distribution of electricity across the residential, commercial, and industrial sectors throughout the year. Our main goal is to accurately predict household electricity usage so that it can be distributed to each home. Deep learning algorithms like LSTM and ARIMA can be used to forecast household electricity use for the upcoming quarter. The dataset offers a thorough representation of state-level energy use. Content data in the form of a time series represents the 17-month period between the 2nd of January 2019 and the 23rd of May 2020. Rows are indexed using dates, and nd states are represented in columns. Together, the rows and columns of each datapoint represent the amount of electricity consumed in MU by the specified state on the mentioned date.

**Goals:**

- Gather household electricity consumption data on a daily level.

- Check for its time series components (trend, stationarity, seasonality, etc)

- Doing statistical analysis

- Build a Deep learning LSTM model to predict the next day’s usage for states

- Build an ARIMA model to predict usage for the next quarter.

- Perform basic EDA and visualizations to gain meaningful insights

**Completed:**

**-** Identifying the right dataset

- Diving the dataset state wise to analyse the top 3 and bottom 3 states as per usage

-EDA

-Basic Statistical Analysis

**Future**

Model building – There will be two models primarily. Following are the steps to the model building

In the case of ARIMA

* First find the PQD order
* Correlation and partial autocorrelation
* Divide Train and test data
* Check accuracy of testing ad predict future
* Predicting for the next quarter

LSTM

* Decomposition to find trend seasonality
* Divide into train and test
* Scale the data
* Define epoch loss
* Specifying the output on the basis of input and predict

**List of similar projects:**

● Multi-step short-term power consumption forecasting with a hybrid deep learning

strategy https://www.mdpi.com/363088

● Domain fusion CNN-LSTM for short-term power consumption forecasting

<https://ieeexplore.ieee.org/abstract/document/9229086/>

**Possible bottleneck:**

● Data gathering: collecting data and checking its sanity

● Data pattern: since we are taking household consumption, the consumption can differ

very vastly depending on the income, number of family members, type of house(duplex,

flat, etc). This can lead to wrong assumption.

● Model: LSTM can easily be overfit if not given proper set of data with proper timeline.