This assignment involves analyzing the “Individual household electric power consumption Data Set” from the UC Irvine Machine Learning Repository. Here’s a breakdown of the dataset and its variables:

\*\*Dataset Description:\*\*

- \*\*Dataset Name:\*\* Electric power consumption

- \*\*File Size:\*\* 20MB

- \*\*Description:\*\* Measurements of electric power consumption in one household with a one-minute sampling rate over a period of almost 4 years. The dataset includes different electrical quantities and sub-metering values.

- \*\*Variables:\*\*

1. \*\*Date:\*\* Date in the format dd/mm/yyyy

2. \*\*Time:\*\* Time in the format hh:mm:ss

3. \*\*Global\_active\_power:\*\* Household global minute-averaged active power (in kilowatt)

4. \*\*Global\_reactive\_power:\*\* Household global minute-averaged reactive power (in kilowatt)

5. \*\*Voltage:\*\* Minute-averaged voltage (in volt)

6. \*\*Global\_intensity:\*\* Household global minute-averaged current intensity (in ampere)

7. \*\*Sub\_metering\_1:\*\* Energy sub-metering No. 1 (in watt-hour of active energy). Corresponds to the kitchen, containing mainly a dishwasher, oven, and microwave (hot plates are gas-powered).

8. \*\*Sub\_metering\_2:\*\* Energy sub-metering No. 2 (in watt-hour of active energy). Corresponds to the laundry room, containing a washing machine, tumble dryer, refrigerator, and light.

9. \*\*Sub\_metering\_3:\*\* Energy sub-metering No. 3 (in watt-hour of active energy). Corresponds to an electric water heater and an air conditioner.

The dataset provides detailed information about household electric power consumption, including active and reactive power, voltage, current intensity, and energy usage in different areas of the household. Analyzing this dataset can help identify patterns, trends, and insights related to electricity usage and energy consumption behavior.

Code for the above assignment :

# Import necessary libraries

Import pandas as pd

Import matplotlib.pyplot as plt

Import seaborn as sns

# Load the dataset

Data\_url = “URL\_TO\_YOUR\_DATASET\_FILE.csv” # Replace with the URL to your dataset file

Df = pd.read\_csv(data\_url)

# Display the first few rows of the dataset to understand its structure

Print(df.head())

# Check for missing values

Print(df.isnull().sum())

# Convert Date and Time columns to datetime format

Df[‘DateTime’] = pd.to\_datetime(df[‘Date’] + ‘ ‘ + df[‘Time’])

Df.set\_index(‘DateTime’, inplace=True)

# Visualize global active power over time

Plt.figure(figsize=(12, 6))

Plt.plot(df.index, df[‘Global\_active\_power’], color=’blue’)

Plt.title(‘Global Active Power Over Time’)

Plt.xlabel(‘Time’)

Plt.ylabel(‘Global Active Power (kW)’)

Plt.show()

# Visualize voltage over time

Plt.figure(figsize=(12, 6))

Plt.plot(df.index, df[‘Voltage’], color=’green’)

Plt.title(‘Voltage Over Time’)

Plt.xlabel(‘Time’)

Plt.ylabel(‘Voltage (V)’)

Plt.show()

# Visualize global intensity over time

Plt.figure(figsize=(12, 6))

Plt.plot(df.index, df[‘Global\_intensity’], color=’orange’)

Plt.title(‘Global Intensity Over Time’)

Plt.xlabel(‘Time’)

Plt.ylabel(‘Global Intensity (A)’)

Plt.show()

# Visualize sub-metering values over time

Plt.figure(figsize=(12, 6))

Plt.plot(df.index, df[‘Sub\_metering\_1’], label=’Kitchen’)

Plt.plot(df.index, df[‘Sub\_metering\_2’], label=’Laundry Room’)

Plt.plot(df.index, df[‘Sub\_metering\_3’], label=’Water Heater & AC’)

Plt.title(‘Sub-metering Over Time’)

Plt.xlabel(‘Time’)

Plt.ylabel(‘Energy Consumption (Wh)’)

Plt.legend()

Plt.show()