Measure Energy Consumption

Phase 1: Problem Definition and Design Thinking

Problem Definition:

The problem at hand is to create an automated system that measures energy consumption, analyzes the data, and provides visualizations for informed decision-making. This solution aims to enhance efficiency, accuracy, and ease of understanding in managing energy consumption across various sectors.

Design Thinking:

Data Source:

- Identify an available dataset containing energy consumption measurements.
- Example: Consider using publicly available energy consumption data from government sources or utility companies.

Data Preprocessing:

- Clean, transform, and prepare the dataset for analysis.
- Remove duplicates, handle missing values, and perform any necessary data transformations.
- Convert data into a standardized format if needed.

Feature Extraction:

- Extract relevant features and metrics from the energy consumption data.
- Identify key parameters like date, time, location, type of energy source, and consumption values.

Model Development:

- Utilize statistical analysis to uncover trends, patterns, and anomalies in the data.
- Apply exploratory data analysis (EDA) techniques to understand data distributions and relationships.
- Consider implementing time-series analysis to capture temporal patterns in energy consumption.

<u>Visualization:</u>

- Develop visualizations (graphs, charts) to present the energy consumption trends and insights.
- Use tools like Python's Matplotlib, Seaborn, or Tableau for creating informative visual representations.
- Generate charts depicting trends over time, seasonal variations, and comparative analysis across different sectors or regions.

<u>Automation:</u>

- Build a script that automates data collection, analysis, and visualization processes.
- Write a script (Python, for instance) that can fetch the latest data, perform data preprocessing, execute the analysis, and generate visualizations.
- Schedule regular updates or data retrieval intervals for real-time monitoring.