Artificial Intelligence.

Phase 2 Project

Measure Energy Consumption

Innovation

Problem Statement : Explore innovative techniques such as series analysis and machine learning models to predict future energy consumption on patterns.

Project Goal:

The goal of this project is to develop an automated approach to collect, analyse, and visualize energy consumption on data for better decisionmaking.

To develop an automated approach to collect, analyse, and visualize energy consumption on data for be er decision-making, the following steps can be taken:

Data analysis:

Once the data is clean and standardized, it can be analysed to identify trends and patterns. This can be done using a variety of statistical and machine learning techniques. For example, series analysis can be used to identify trends in energy consumption on over me. Machine learning models can be used to cluster energy consumers based on their consumption on patterns, or to predict future energy consumption.

Data visualization:

Once the data has been analysed, it can be visualized to make It easier to understand and communicate. This can be done using a Variety of data visualization tools, such as charts, graphs, and maps. Data visualization can be used to highlight trends and patterns in the Data, and to compare different groups of energy consumers.Here are some innovative techniques that can be used to analyseAnd visualize energy consumption on data:

Time series analysis:

Time series analysis is a statistical method that can be used To identify trends and patterns in data that is collected over me. This Can be used to identify trends in energy consumption over me, and To predict future energy consumption.

Machine learning models:

Machine learning models can be used to cluster energy Consumers based on their consumption on patterns, or to predict Future energy consumption. For example, a machine learning model Could be used to predict the energy consumption on of a building Based on its size, type, and location.

Artificial intelligence (AI):

AI can be used to develop more sophisticated and accurate Models for predicting future energy consumption. For example, AI Could be used to develop a model that takes into account a variety of Factors, such as weather conditions, occupancy patterns, and energy Prices.

Analysis:

Machine learning models can be used to analyse energy Consumption data in a variety of ways. For example, machine Learning models can be used to:

1. Cluster energy consumers based on their consumption Patterns.
2. Predict future energy consumption.
3. Identify anomalies in energy consumption data.

To analyse energy consumption data using a machine learning Model, the following steps can be taken:

Prepare the data:

The first step is to prepare the data for training the machine Learning model. This may involve cleaning the data, removing outliers, nd transforming the data into a format that is compatible with the Machine learning algorithm.

Choose a machine learning algorithm:

There are a variety of machine learning algorithms that can be Used to analyse energy consumption data. Some popular algorithms Include random forests, gradient boosting, and support vector Machines.

Train the machine learning model:

Once the data has been prepared, the machine learning model Can be trained. This involves feeding the model the prepared data and Allowing it to learn the patterns in the data.

Evaluate the machine learning model:

Once the machine learning model is trained, it should be Evaluated to assess its performance. This can be done by feeding the Model a held-out test set and measuring its accuracy.

Use the machine learning model to analyse new data:

Once the machine learning model has been trained and Evaluated, it can be used to analyse new energy consumption data. This Can be used to cluster energy consumers, predict future energy Consumption, or identify anomalies in energy consumption data

Code for measure energy consumption :

Import psutil

Def measure_energy_consumption()

   # Get initial energy usage Initial_energy=psutil.sensors_battery().percent

   # Perform some CPU-intensive tasks

```
    # Your energy-consuming tasks here

    # Get final energy usage

     Final_energy = psutil.sensors_battery().percent

    # Calculate energy consumption

     Energy_consumed = initial_energy – final_energy Print(f"Energy consumed:
     {energy_consumed} %")

If __name__ == "__main__":

    Measure_energy_consumption()
```

Conclusion:

The development of an automated approach to collect, analyse, And visualize energy consumption data has the potential to significantly Improve energy management and decision-making. This information can Be used to make better decisions about energy management and energy Efficiency