**Optimizing Energy Consumption in Smart Homes Using Machine Learning**

**Project Description:**

Smart homes produce significant amounts of data from appliance usage, making it possible to optimize energy consumption. This project aims to develop a machine learning model that predicts energy consumption based on historical data from smart homes, allowing for optimization of appliance usage to reduce energy waste and costs. The project will use the "Individual household electric power consumption**"** dataset from the UCI Machine Learning Repository.

**Research Question:**

Can a machine learning model predict smart home energy consumption based on historical usage data, and can this model help optimize energy consumption patterns to reduce waste and costs?

**Hypothesis:**

The hypothesis is that energy consumption patterns can be effectively predicted using historical data, and the resulting model will allow for optimizing energy consumption in smart homes.

**Importance:**

* **Cost Reduction**: Predicting energy consumption enables households to lower electricity bills.
* **Sustainability**: Reducing energy waste contributes to lower carbon footprints.
* **Smart Home Efficiency**: Enhances smart home systems by allowing data-driven automation of energy-saving behaviors.

**Data Sources:**

**Dataset**: "Individual household electric power consumption" from the UCI Machine Learning Repository, including:

* Energy usage data (e.g., Global\_active\_power, Sub\_metering\_1, 2, 3).
* Time-based records (hourly, daily).

**Project Impact:**

This project will enable smart home users to optimize energy consumption, resulting in cost savings and a reduced environmental impact by minimizing energy waste.

A screenshot of a computer

Description automatically generated