Appliance Energy Prediction

1. subject description

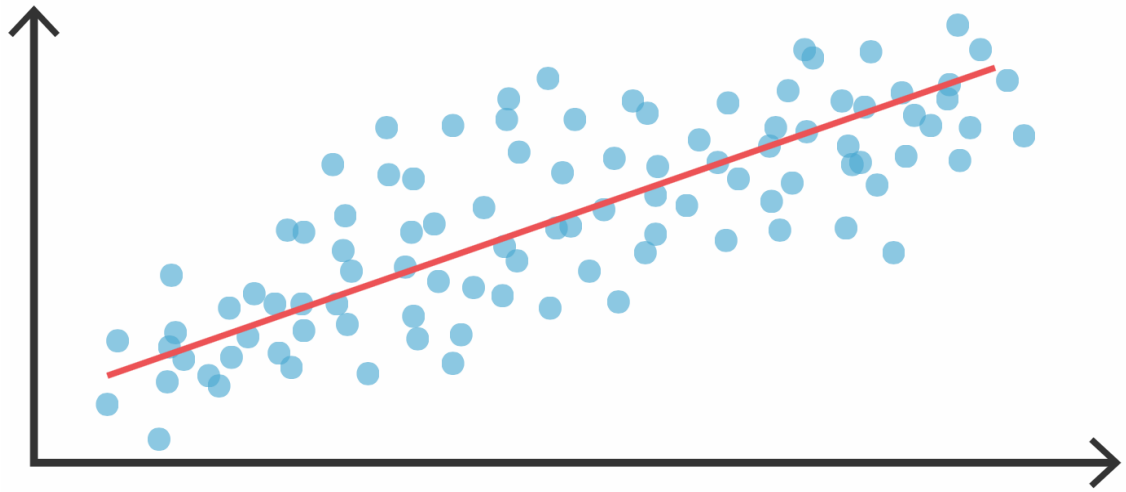
In this time of global uncertainty, the world needs energy and in increasing quantities to support economic and social progress and build a better quality of life, in particular in developing countries. But even in today's time there are many places especially in the developing world where there are outages. These outages are primary because of excess load consumed by appliances at home. Heating and cooling appliances take most power in the house. In this project we will be analyzing the appliance usage in the house gathered via home sensors. All readings are taken at 10 mins intervals for 4.5 months . The goal is to predict energy consumption by appliances .
So the objective is to build a model that can accurately predict the energy usage of appliances based on these input variables.
In the following we introduce the project goals, data description evaluation measure and some important references.

2. goals

- Feature Selection: Identify the most relevant features that contribute significantly to the energy consumption prediction. Apply appropriate feature selection techniques.
- Train a regression model.

3. previews

The figure below shows an example of regression model prediction.



4. data description

The Appliance Energy Prediction dataset typically consists of several attributes that describe various aspects related to energy consumption. The dataset contains a total of 28 attributes, excluding the date attribute. These attributes are of various types, including 26 attributes of type float and 2 attributes of type int.

	date	Appliances	lights	T1	RH_1	T2	RH_2	T3	RH_3	T4	RH_4	T5	RH_5
0	2016-01-11 17:00:00	60	30	19.89	47.596667	19.2	44.790000	19.79	44.730000	19.000000	45.566667	17.166667	55.20
1	2016-01-11 17:10:00	60	30	19.89	46.693333	19.2	44.722500	19.79	44.790000	19.000000	45.992500	17.166667	55.20
2	2016-01-11 17:20:00	50	30	19.89	46.300000	19.2	44.626667	19.79	44.933333	18.926667	45.890000	17.166667	55.09
3	2016-01-11 17:30:00	50	40	19.89	46.066667	19.2	44.590000	19.79	45.000000	18.890000	45.723333	17.166667	55.09
4	2016-01-11 17:40:00	60	40	19.89	46.333333	19.2	44.530000	19.79	45.000000	18.890000	45.530000	17.200000	55.09

5. evaluation measures

- mean squared error (MSE), root mean squared error (RMSE), R-squared.

6. references

- https://www.sciencedirect.com/science/article/abs/pii/S0378778816308970?via%3Dihub
- https://medium.com/analytics-vidhya/appliances-energy-prediction-2562af6ad3d9
- https://www.sciencedirect.com/science/article/abs/pii/S0360544212002903
- https://www.academia.edu/48852012/Appliance_Energy_Prediction_Using_Time_Series_Forecasting_A_comparative_analysis_of_different_Machine_Learning_Algorithms