Energy usage of Appliances

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# Appliances

In most households around the world, there are multiple electrical appliances that consume energy either throughout the day or when it is used. Modern appliances have the options to be in standby to save energy when they are not used, but some appliances such as refrigerator, internet modems, and security cameras have to be powered all the time and consume energy continuously.

In this dataset, we examine a low-energy home outfitted with multiple IoT devices to measure temperature (T) and relative humidity (RH) in multiple rooms along with the energy expended by lights and appliances in watt-hours (Wh). Weather data is also provided from a nearby weather station to improve the prediction modeling.

## **Energy Consumption**

The amount of energy needed to a specific house will depend on many factors such as the number of appliances, frequency of use, geographical location and climate, number of occupants and efficiency of the house itself.

The overall energy usage of a house can easily be aggerated but knowing individual factors which contributes in higher usage is not an easy task.

“Data driven prediction models of energy use of appliances in a low-energy house” is a paper by Luis M.Candanedo, Véronique Feldheim and Dominique Deramaix which presented and discussed data driven prediction models of energy use of appliances.

Temperature and humidity data collected at different part of house for this paper will be used to apply multivariate analysis, data cleaning techniques, and other data visualization skills we learned in this course. Dataset can be found at [https://archive.ics.uci.edu/ml/datasets/Appliances+energy+prediction#](https://archive.ics.uci.edu/ml/datasets/Appliances+energy+prediction)

## **Attribute List**

|  |  |
| --- | --- |
| Date | Year-month-day hour:minute:second |
| Appliances | Energy use in Wh |
| lights | Energy use of light fixtures in the house in Wh |
| T1 | Temperature in kitchen area in Celsius |
| RH\_1 | Humidity in kitchen area in % |
| T2 | Temperature in living room area in Celsius |
| RH\_2 | Humidity in living room area in % |
| T3 | Temperature in laundry room area |
| RH\_3 | Humidity in laundry room area in % |
| T4 | Temperature in office room in Celsius |
| RH\_4 | Humidity in office room in % |
| T5 | Temperature in bathroom in Celsius |
| RH\_5 | Humidity in bathroom in % |
| T6 | Temperature outside north side of building in Celsius |
| RH\_6 | Humidity outside north side of building in % |
| T7 | Temperature in ironing room in Celsius |
| RH\_7 | Humidity in ironing room in % |
| T8 | Temperature in teenager room 2 in Celsius |
| RH\_8 | Humidity in teenager room 2 in % |
| T9 | Temperature in parents room in Celsius |
| RH\_9 | Humidity in parents room in % |
| To | Temperature outside in Celsius - Chievres weather station |
| Pressure | In mm Hg - Chievres weather station |
| RH\_out | Humidity outside in % - Chievres weather station |
| Wind speed | In m/s - Chievres weather station |
| Visibility | In km - Chievres weather station |
| Tdewpoint | Â°C - Chievres weather station |
| rv1 | Random variable 1 nondimensional |
| rv2 | Random variable 2 nondimensional |

## **Correlation Table**

An abbreviated snapshot of attributes is included to demonstrate suitability for further analysis.

round(cor(energydata\_complete[,1:8]),2)

## Appliances lights T1 RH\_1 T2 RH\_2 T3 RH\_3  
## Appliances 1.00 0.20 0.06 0.09 0.12 -0.06 0.09 0.04  
## lights 0.20 1.00 -0.02 0.11 -0.01 0.05 -0.10 0.13  
## T1 0.06 -0.02 1.00 0.16 0.84 0.00 0.89 -0.03  
## RH\_1 0.09 0.11 0.16 1.00 0.27 0.80 0.25 0.84  
## T2 0.12 -0.01 0.84 0.27 1.00 -0.17 0.74 0.12  
## RH\_2 -0.06 0.05 0.00 0.80 -0.17 1.00 0.14 0.68  
## T3 0.09 -0.10 0.89 0.25 0.74 0.14 1.00 -0.01  
## RH\_3 0.04 0.13 -0.03 0.84 0.12 0.68 -0.01 1.00

Diagram

Description automatically generated