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#

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 %

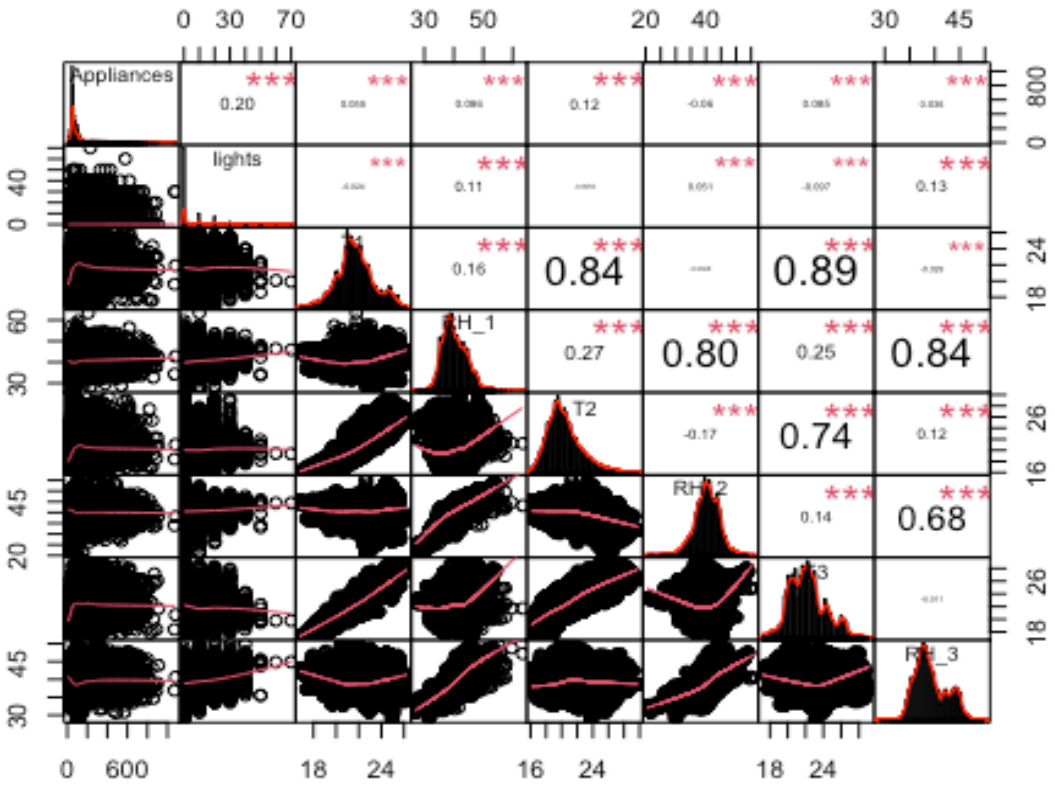
T7	Temperature in ironing room in Celsius
RH_7	Humidity in ironing room in %
T8	Temperature in teenager room 2 in Celsius
RH_8	Humidity in teenager room 2 in %
T9	Temperature in parents room in Celsius
RH_9	Humidity in parents room in %
To	Temperature outside in Celsius - Chievres weather station
Pressure	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
```


Appliances
lights
RH_1
T2
RH_2
RH_3
0.20
0.11
0.16
0.84
0.27
0.80
0.25
0.84
0.74
0.12
0.14
0.68
0.89
0.13