Project Title: Appliances Energy Prediction Set

Data source: https://archive.ics.uci.edu/ml/datasets/Appliances+energy+prediction
https://github.com/LuisM78/Appliances-energy-prediction-data/blob/master/variables%20description.txt

Background:

The data set is at 10 min for about 4.5 months. The house temperature and humidity conditions were monitored with a ZigBee wireless sensor network. Each wireless node transmitted the temperature and humidity conditions around 3.3 min. Then, the wireless data was averaged for 10 minutes periods. The energy data was logged every 10 minutes with m-bus energy meters. Weather from the nearest airport weather station (Chievres Airport, Belgium) was downloaded from a public data set from Reliable Prognosis (rp5.ru), and merged together with the experimental data sets using the date and time column.

Objectives:

The objectives of this project are:

1. To pre-process the data to ensure data is cleaned and ready for next stage of analysis. Append 2 months data using concatenate node in KNIME, or UNION function in TABLEAU.

2. To perform exploratory data analysis to gain insights into the data. Possible operations are date time processing, gathering of statistical data and necessary data transformation.

3. To perform data visualisation to discover patterns, correlations etc. Possible operations are plot of light or temperature, humidity values vs time, plot of day of week vs appliances' energy as data etc. Build an interactive dashboard for meaningful data mining.

4. To fit the data into a linear regression model to predict the appliances' energy. Discuss the accuracy of the model.

Variable Description

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date time	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 the building (north side), in Celsius
RH_6	Humidity outside the building (north side), 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 (from Chièvres weather station), in Celsius
Press_mmHg	Pressure (from Chièvres weather station), in mm Hg
RH_out	Humidity outside (from Chièvres weather station), in %
Windspeed	Windspeed (from Chièvres weather station), in m/s
Visibility	Visibility (from Chièvres weather station), in km
Tdewp	Tdewpoint (from Chièvres weather station), °C

The house is located in Stambruges, which is about 24 km from the City of Mons in Belgium (See *house_picture.png*). The construction was finished on December 2015. All the mechanical systems are new. The floor plans are also provided (*First floor and second floor pictures*)

The total floor area is 280 m^2, from which the total heated area is 220 m^2. The façade of the house is oriented +10° (Southwest) from due South. There are usually four occupants of the house, two adults and two teenagers. One of the adults works regularly in the home office.

The appliances energy metering includes the energy used by the devices listed in Table 1.

Room	Equipment
Laundry	Small Fridge, Upright freezer, Wine Cellar for 160 bottles, Washing machine, Dryer, Internet router, internet hub, Network Attached Storage
Garage*	Rain water pump, electric garage door
Kitchen	Fridge, Induction cooktop, Kitchen hood, Microwave, Oven, Dishwasher, Coffee machine
Dining	WIFI booster, ZigBee coordinator, electrical blinds
Living	TV 138 cm, Hard drive enclosure, DVD player, cable box, laptop, Ink-jet printer, electric blinds
Office	2 desktop computers, 3 computer screens, 1 router, 1 laptop, 1 copier-printer, electric blinds
Ironing	Alarm clock, radio, Iron, electric blind
Room 1	Alarm clock, radio, electric blind, 2 lamps
Room 2	Desktop computer, monitor, alarm clock, electric blind
Room 3	Laptop, alarm clock
Game	93 cm TV, Internet router, DVD player, PlayStation
Bathroom 1	2 electric toothbrushes, hair dryer
Bathroom 2	2 electric toothbrushes
Attic*	Computer, Musical Instruments, Amplifier

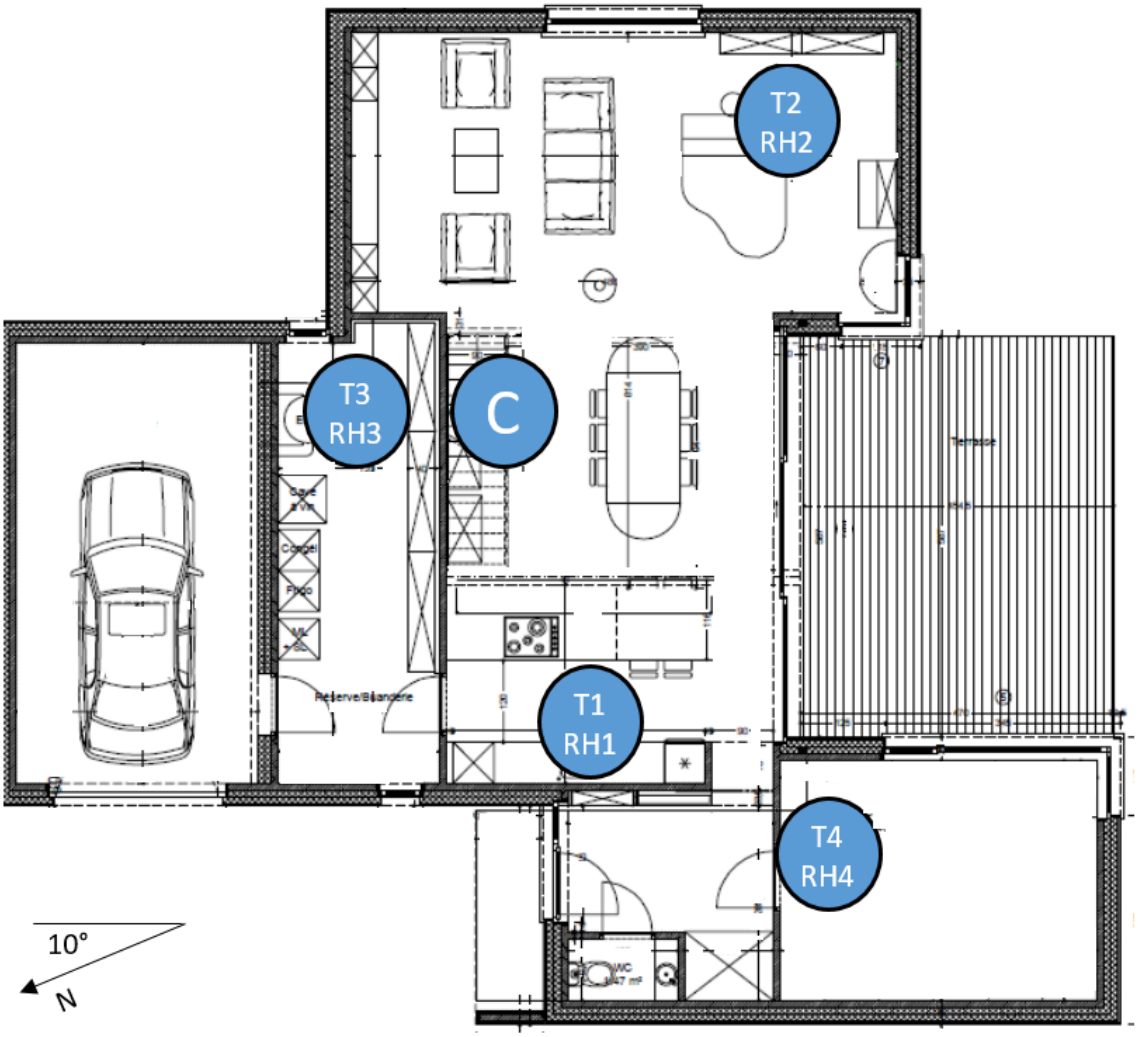
Table 1

Data Assigned:

S/N	Data File	Assigned (Tick)
1	Jan_data.csv & Feb_data.csv	
2	Jan_data.csv & April_data.csv	
3	March_data.csv & May_data.csv	
4	Feb_data.csv & May_data.csv	
5	April_data.csv & May_data.csv	

House Picture

Appendix 1-Sensor location on First Floor



Appendix 2 – Sensor Locations on Second Floor