ASHRAE - Great Energy Predictor III

How much energy will a building consume?

Project Goals

- Provide the most accurate predictions
- Specify the most influential features
- Help plan the budget based on weather forecasts

Situation

- environmental context
  - too much energy is wasted over nothing
- economic context
  - too much money is wasted over nothing
- time context
  - being eco-friendly affects your business image

Data

3 years of hourly meter readings

2016 - 2018

over 1000 buildings

- education
- lodging
- office
- ...

several different sites around the world

- Europe
- Canada
- USA
- ...

Approach

- clear the data
- analyze features
- build and train a model
- test its accuracy

Model description

Overview of Basic Methodology: predict the rate for the electricity consumption per meter

Model: linear regression model

Dependent variable: meter reading

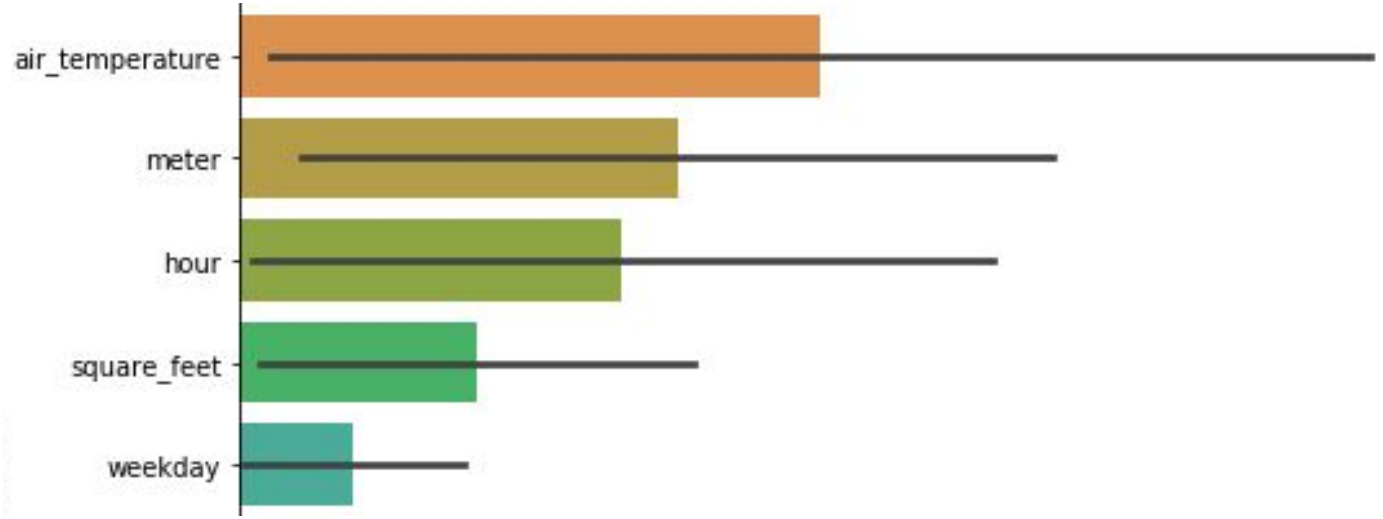
Scope*:* 3 years of hourly meter readings from over 1000 buildings, weather records on wind, temperature and pressure at several different sites around the world

Sampling: train.csv for training + cross validation, test.csv for testing

Results: total error is about 1Б showing good accuracy

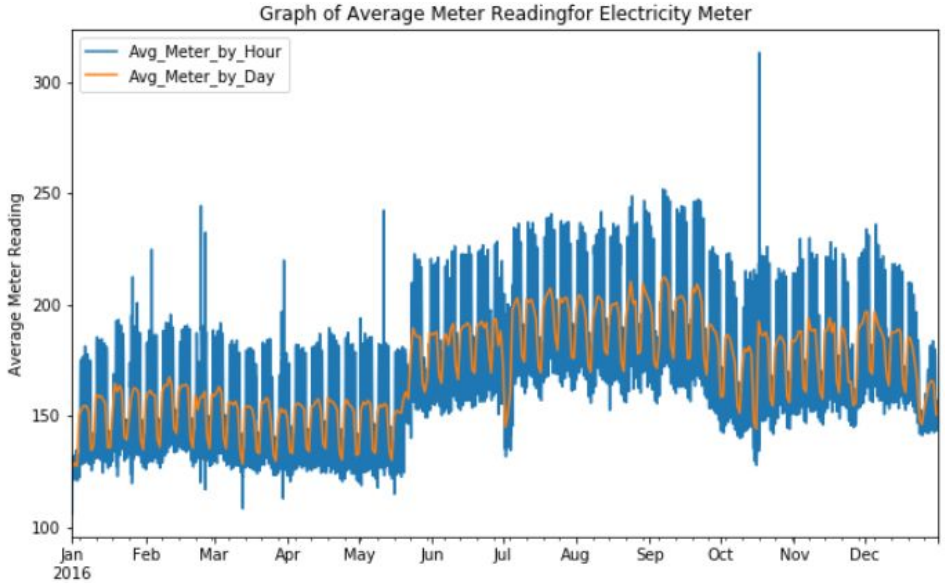
Key points

5 most influential features for energy consumption



Key points

During the week electricity is consumed unevenly by buildings



Recommendations

- **Use the model when creating a business plan**
  It is important to know building maintenance costs in advance
  Seasonal or periodic costs can be planned

- **Use the model at the building design and construction stage**
  Some building characteristics can be changed to achieve the necessary maintenance costs
  When choosing the location of the building, think about average temperature in these places

- **Try to collect data about more building types**

  Now education buildings are found most often in the dataset. More data about other types of buildings can make the model more accurate