Energy Consumption Prediction in the Home

Sprint 2

March 15, 2024

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Introduction

Motivation: Alberta Energy Crisis

Problem Statement

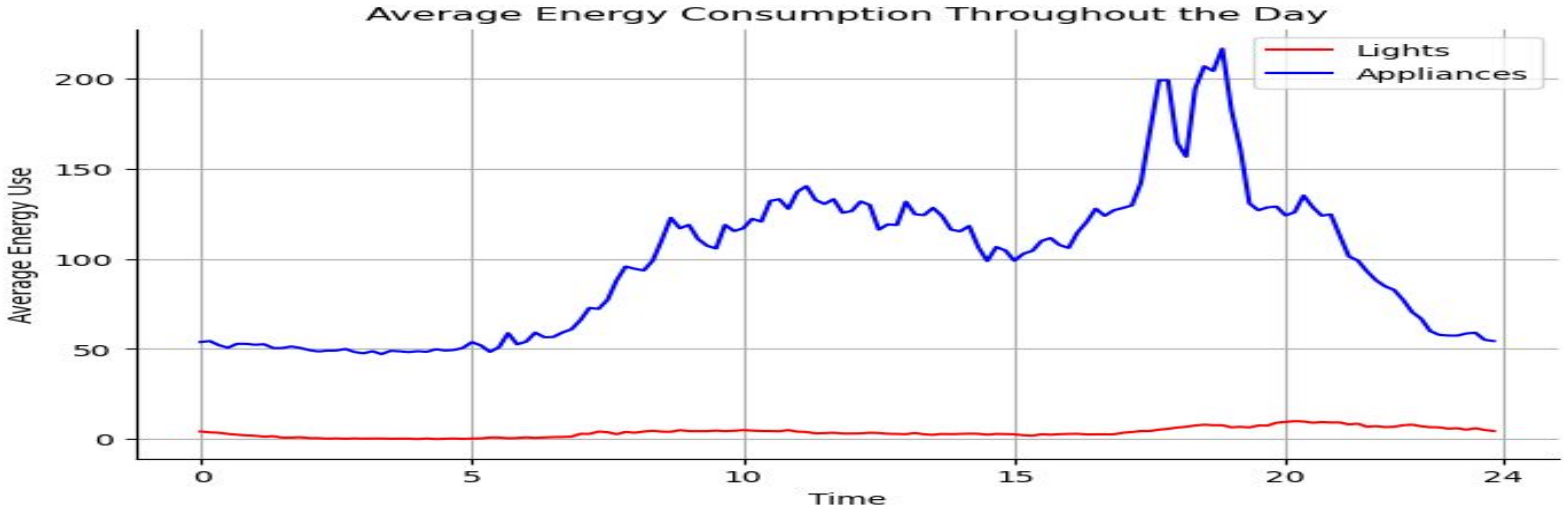
We do not comprehensively understand how appliances in our homes use energy

Goal

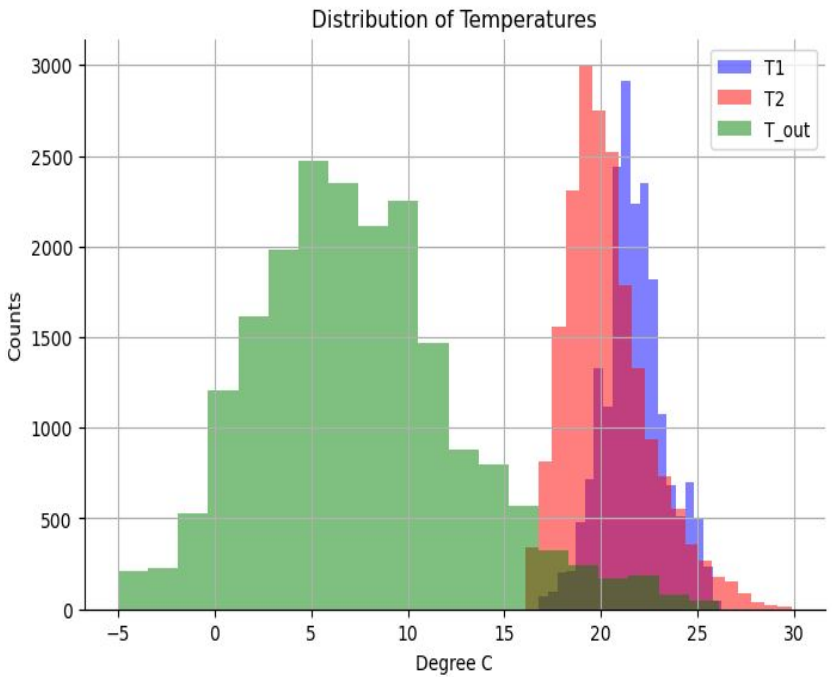
Create predictive models to explore the relationship between energy consumption of appliances and various predictors

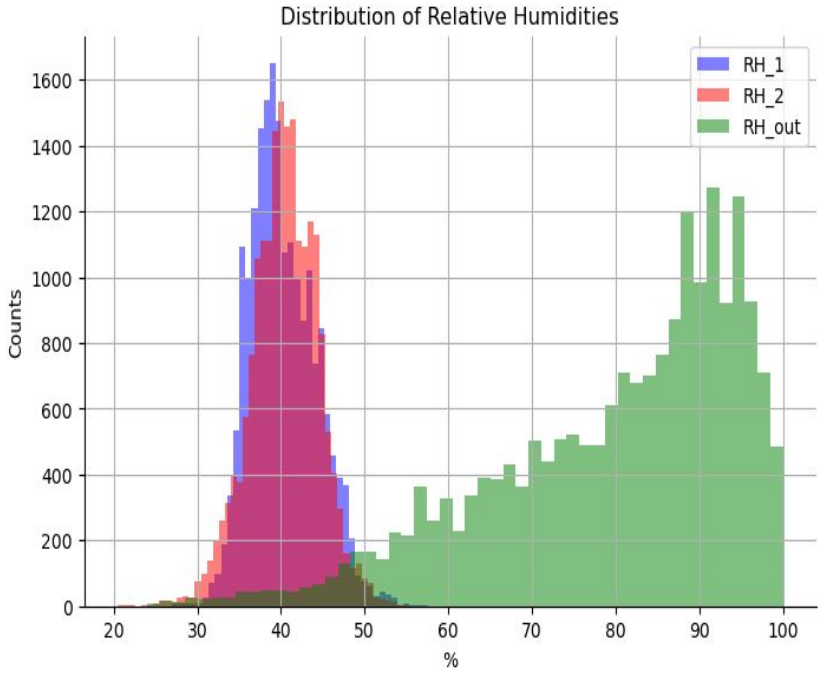
Background: Understanding the Dataset

- Energy consumption of a house in Belgium from **Jan 2016- May 2016**
- Data source: temperature and humidity sensors, nearby weather station
- Features: energy use, temperature, relative humidity, wind speed
- The dataset contains 19,735 rows and 29 attributes (columns)



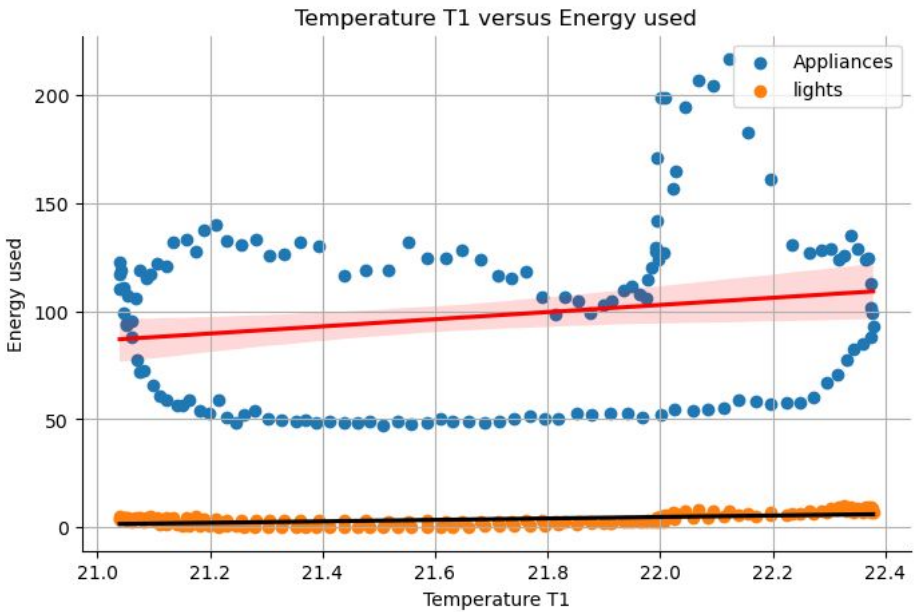
Understanding the Dataset: Feature Distribution

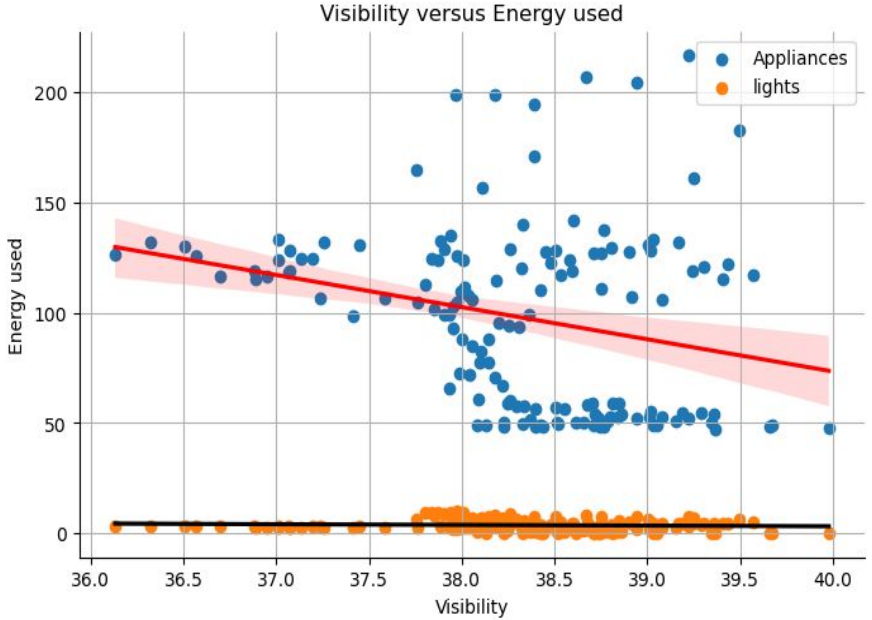




Temperature and relative humidity data are normally distributed

Understanding the Dataset: Feature-Target Correlation





Temperature and visibility correlate differently with energy consumed by appliances

Linear Regression

Linear Regression Method	R2
Simple linear regression	0.16
Ridge regression	0.16
Linear regression after dealing with multicollinearity	0.16

- Linear regression is too weak to learn sufficiently from the dataset
- Neural network, random forest regressor should perform better

Potential Impact of Solution

- Microgrid planning
- Detect abnormal energy use patterns
- Energy management system
- Demand side management