

Energy Performance Visualization of Buildings

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Background

- Energy Consumption of the CIRS building
 - Plug load consumption
 - Lighting load consumption
 - **Mechanical load**



- Minute by minute consumption data for 24 panels
 - 15 Excel workbooks around 160 MB each

Points of Interest and Motivation

- Poor visualizations to give a historical energy consumption feedback of the building
- No proof of weekly/seasonal trends in consumption
- Of interest to the building managers and researchers working on the building

High level Goals

- Discovering overall trends in consumption in specific spaces
- Knowing the proportion of each space
- Understanding what an average week looks like
- Web-enabled tool

Data Abstraction

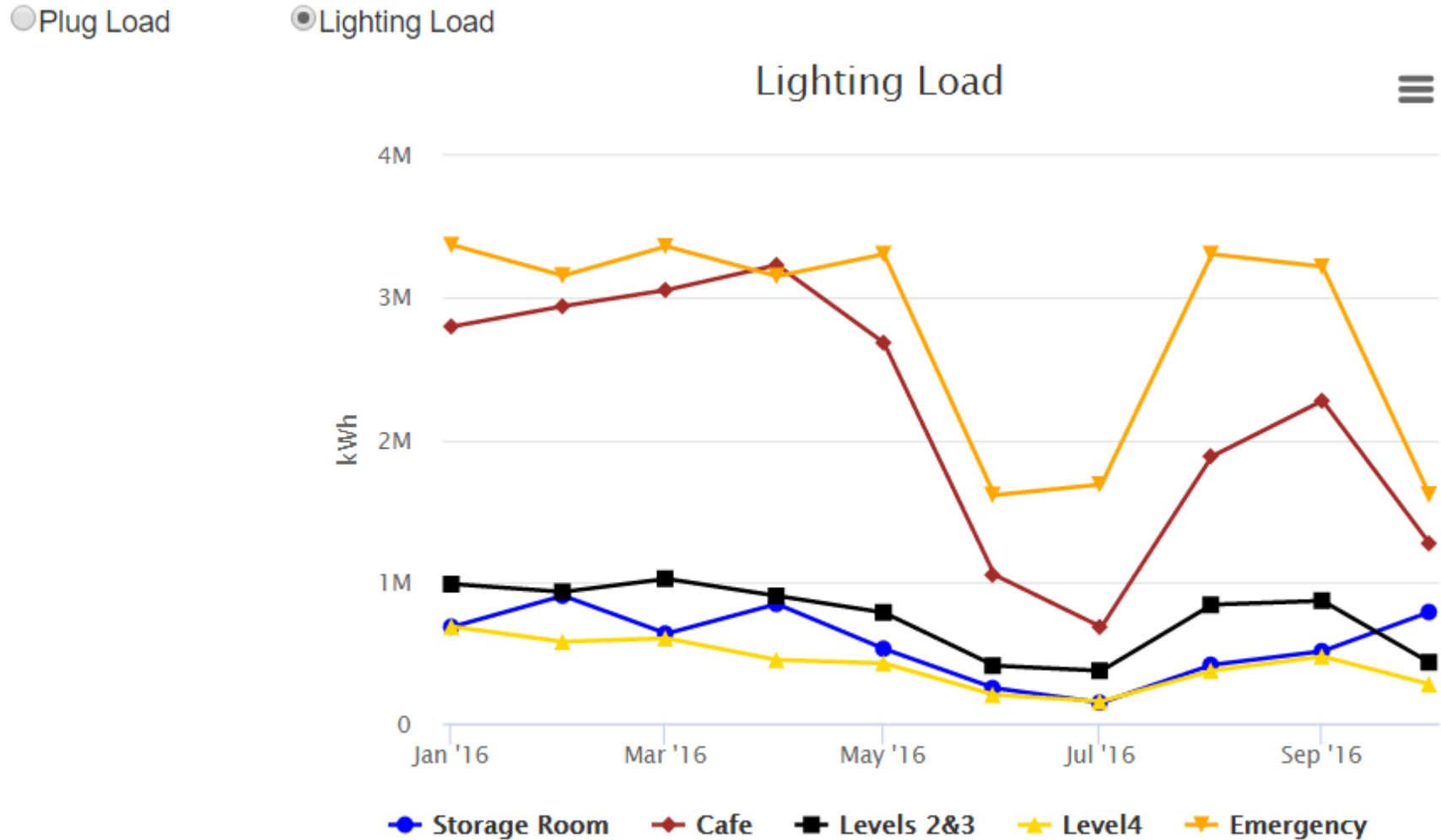
- Dataset
 - Dataset Type
 - Table
 - Dataset Availability
 - Static
- Attribute
 - Types
 - Categorical
 - Quantitative
 - Ordering direction
 - Sequential
 - Cyclic

The screenshot shows an Excel spreadsheet with the following data:

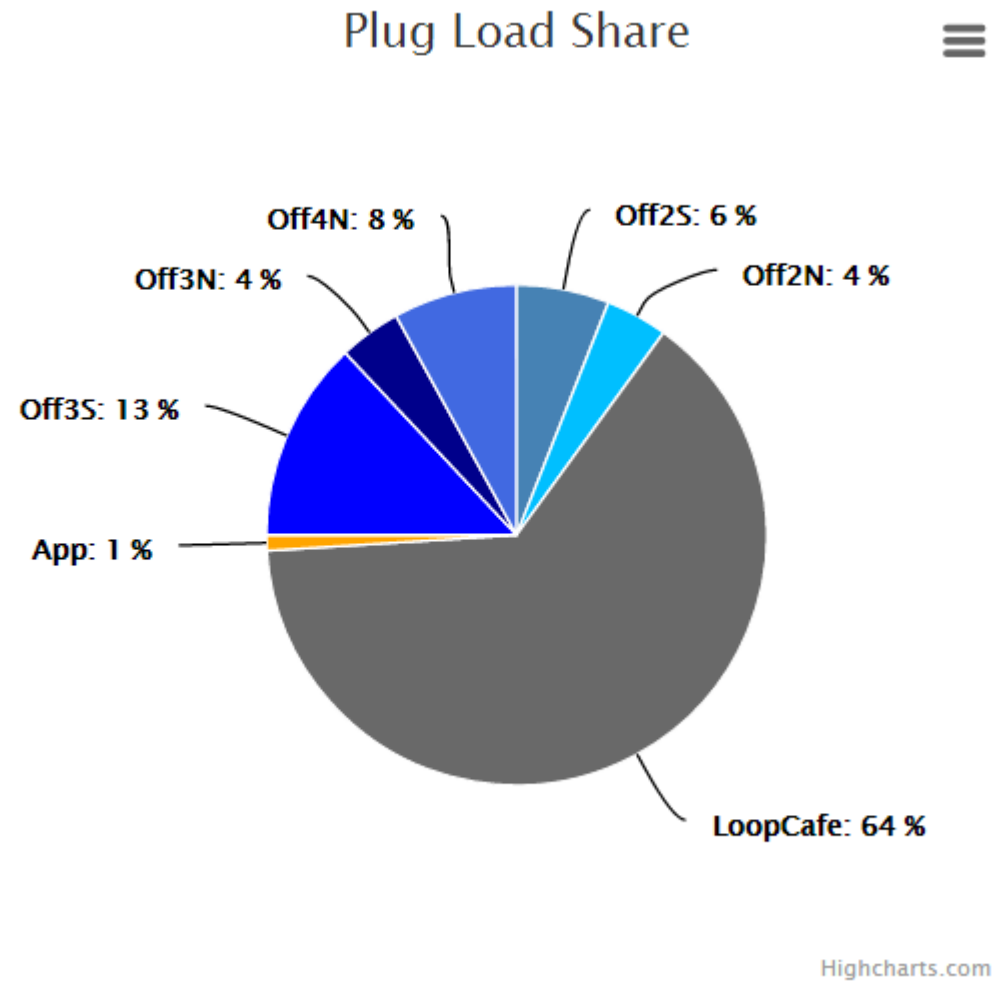
	A	B	C	D	E	F	G	H	I
1	Date	Hour	2E0B	2E2A	2E2B	2E3A	2E4A	2E4B	2N0A
2	1/1/2016	0:00	0	0	0	0	0	0	0
3	1/1/2016	0:01	0	0	0	0	0	0	0
4	1/1/2016	0:02	0	0	0	0	0	0	0
5	1/1/2016	0:03	0	0	1,000	0	0	0	0
6	1/1/2016	0:04	0	0	0	0	0	0	0
7	1/1/2016	0:05	0	0	0	0	0	0	0
8	1/1/2016	0:06	0	0	0	0	0	0	0
9	1/1/2016	0:07	0	0	0	0	0	0	0
10	1/1/2016	0:08	1,000	0	0	0	0	0	0
11	1/1/2016	0:09	0	0	0	0	0	0	0
12	1/1/2016	0:10	0	0	0	0	0	0	0
13	1/1/2016	0:11	0	0	0	0	0	0	0
14	1/1/2016	0:12	0	0	0	0	0	0	0
15	1/1/2016	0:13	0	0	0	0	0	0	0
16	1/1/2016	0:14	0	0	0	0	0	0	0
17	1/1/2016	0:15	0	0	0	0	0	0	0
18	1/1/2016	0:16	0	0	0	0	0	0	0
19	1/1/2016	0:17	0	0	0	0	0	0	0
20	1/1/2016	0:18	0	0	0	0	0	0	0
21	1/1/2016	0:19	0	0	0	0	0	0	0
22	1/1/2016	0:20	0	0	0	0	0	0	0
23	1/1/2016	0:21	1,000	0	0	0	0	0	0
24	1/1/2016	0:22	0	0	0	0	0	0	0
25	1/1/2016	0:23	0	0	0	0	0	0	0
26	1/1/2016	0:24	0	0	0	0	0	0	0
27	1/1/2016	0:25	0	0	0	0	0	0	0
28	1/1/2016	0:26	0	0	0	0	0	0	0
29	1/1/2016	0:27	0	0	0	0	0	0	0

But what it really means

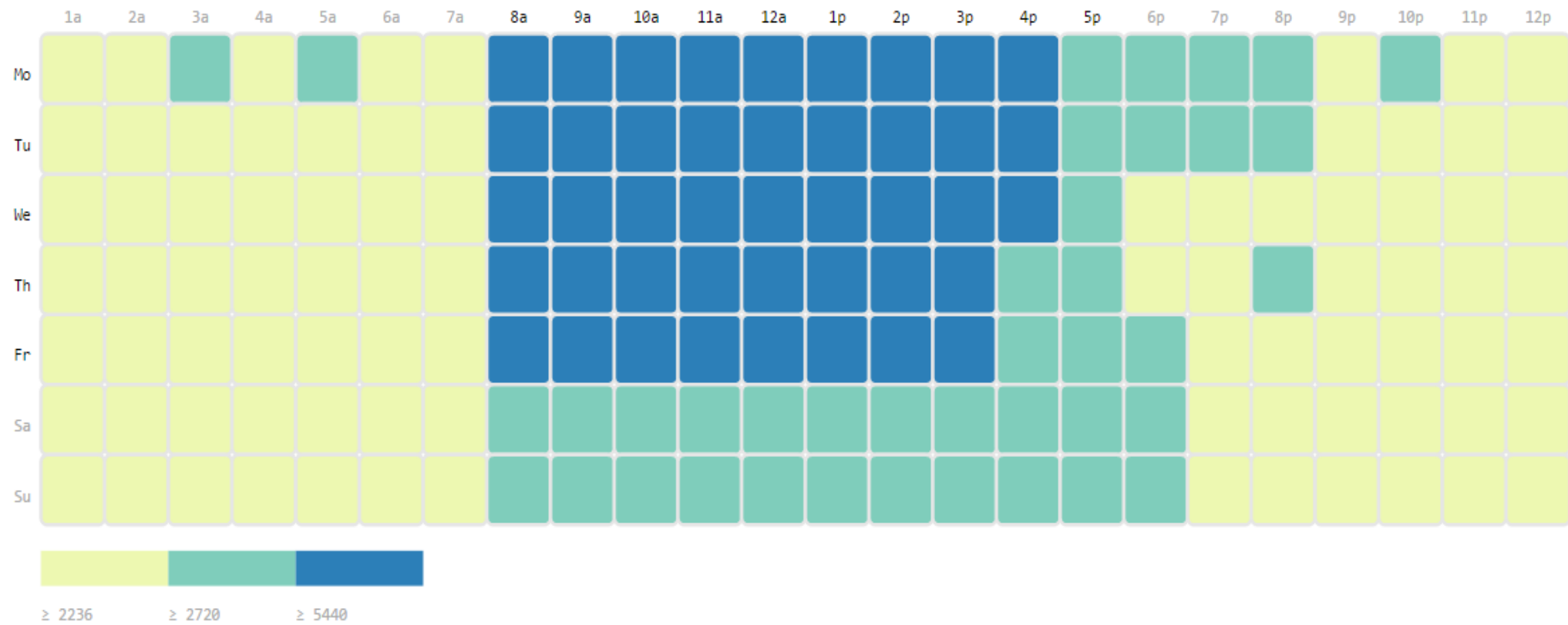
- Interactive Line chart



- Pie Chart



- Heat map



[Loopcafe.tsv](#)
[SecondFloorNorthwing.tsv](#)
[SecondFloorSouthwing.tsv](#)
[ThirdFloorNorthwing.tsv](#)
[ThirdFloorSouthwing.tsv](#)
[FourthFloorNorthwing.tsv](#)

Demo!

Task Abstraction

- Actions
 - Consume
 - Discovering
 - Search
 - Explore
 - Query
 - Identify
 - Summarize
- Targets
 - Trends
 - Features

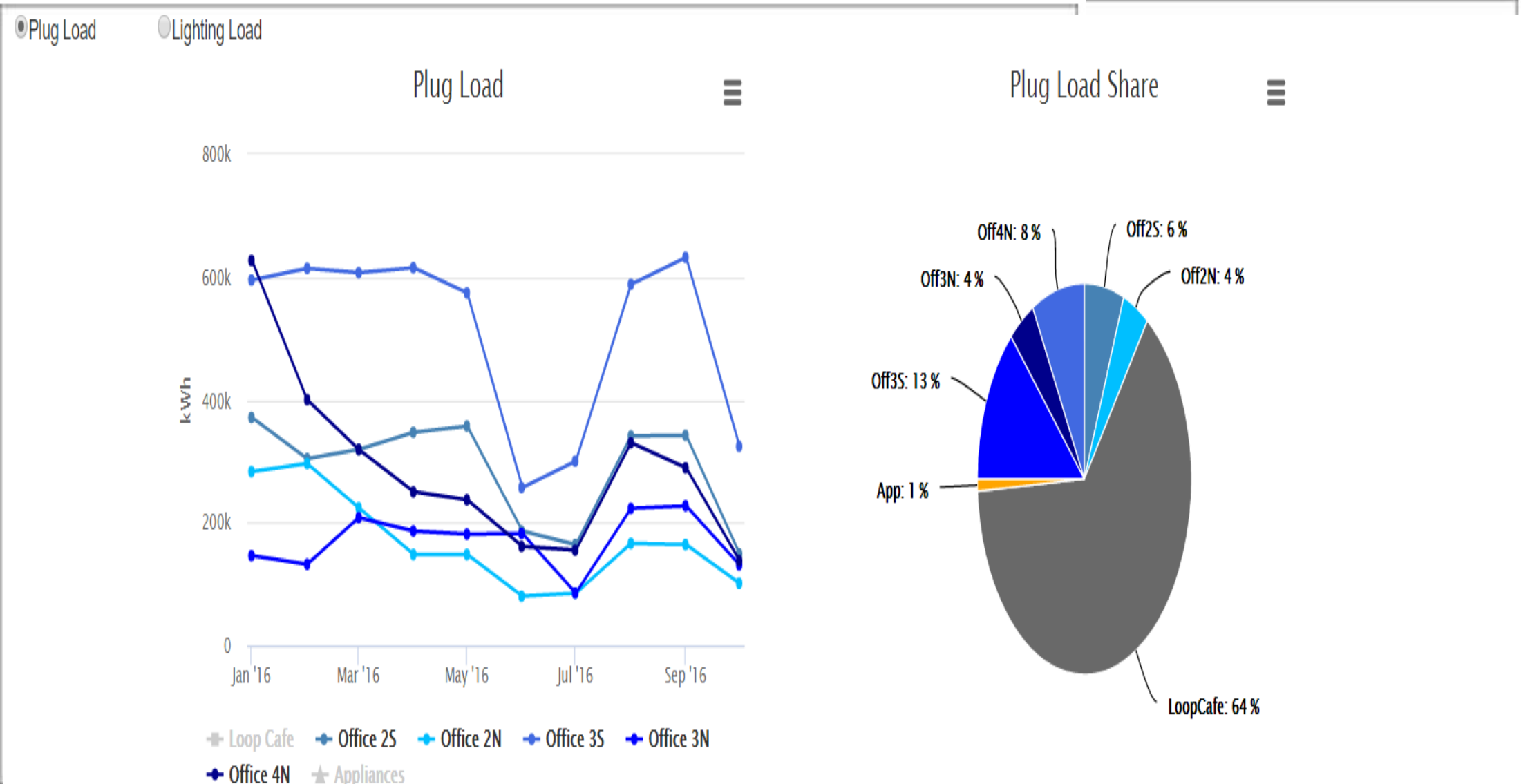
How

- Encode
 - Align and Express
 - Color
 - Hue
 - Shades
 - Shape
 - Size
- Manipulate
 - Select
- Facet
 - Juxtapose
- Reduce
 - Filter
 - Aggregate

Learning experience and Limitations

- Learning experience
 - Working with a client
 - Applying freshly gained knowledge to real world problems
 - Learning HTML,D3,jQuery,highcharts
- Limitations
 - Time
 - Coding Knowledge

Lastly



THANKS !