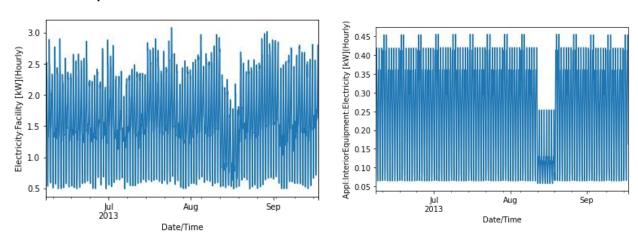**Merge two datasets**

For get hourly consumption of app4, the function called 'resample' is applied.

For merging the two datasets, the general idea is to format each dataset's datetime, so that the datetime in two datasets are comparable.
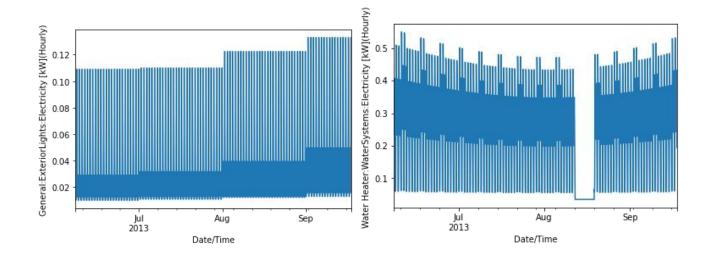
One nuance: In order to format the datetime, the year must be added. So I am assuming the data in 'USA_AL_Auburn-Opelika.AP.722284_TMY3_BASE' is also from 2013.
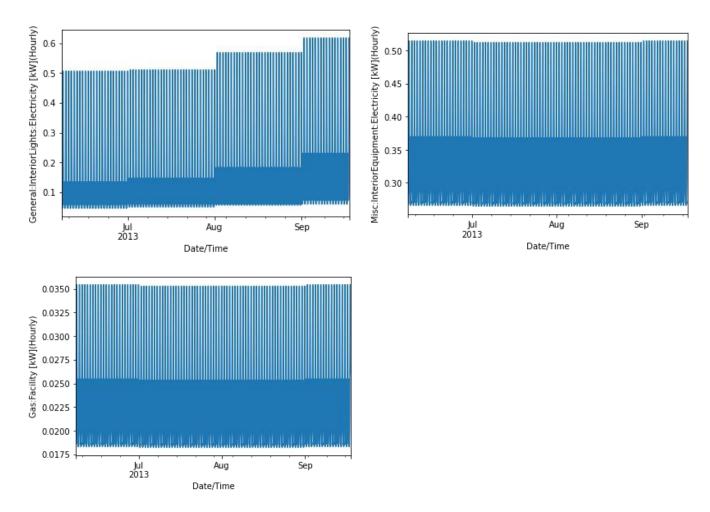
The overlapping time period found is from 2013-06-07 to 2013-09-17. The following analysis is based on the overlapping time period.
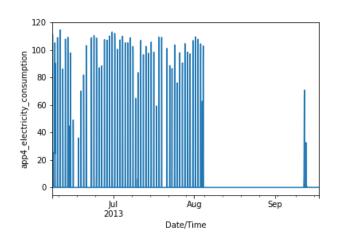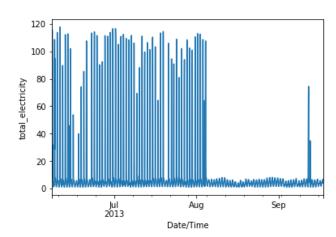
1. Time series plots

For facility and Appl electricity consumption, we can see an obvious drop during mid-August.

For exterior/interior lights, water heater, Misc electricity consumption as well as gas consumption, they show strong seasonality.
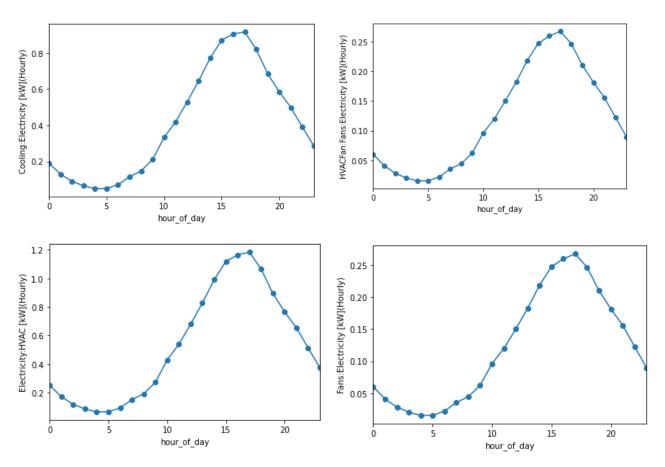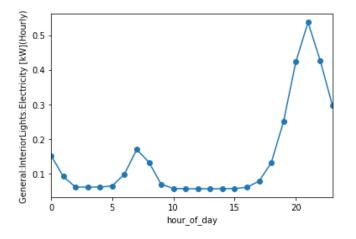
We can see the patterns for app4 and total electricity consumption is quite similar, the reason is that app4 is contributing most to total electricity consumption.
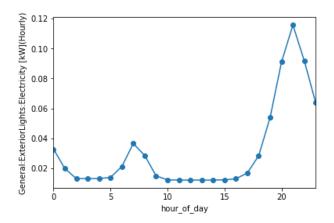
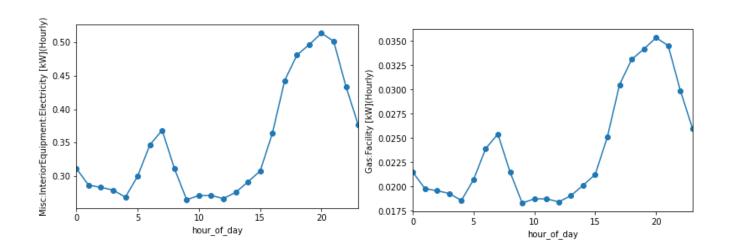It is reasonable to see energy consumption related to heating is zero during summer.

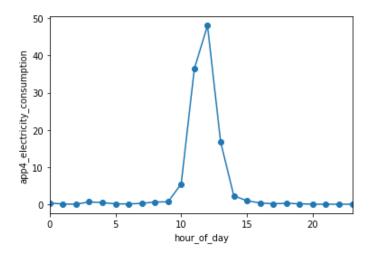**2. Summarize based on hour of the day**

For cooling, HVAC fan, HVAC and fans electricity consumptions, they show similar patterns, start rising in the morning and decreasing in the evening. My guess is that they function at the same time.
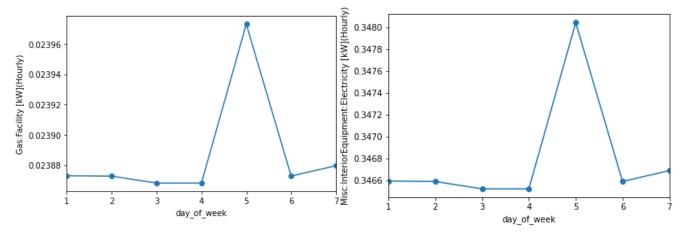
For these four facilities, they mainly function from 4 am to 9 am and from 3 pm to 6 pm.
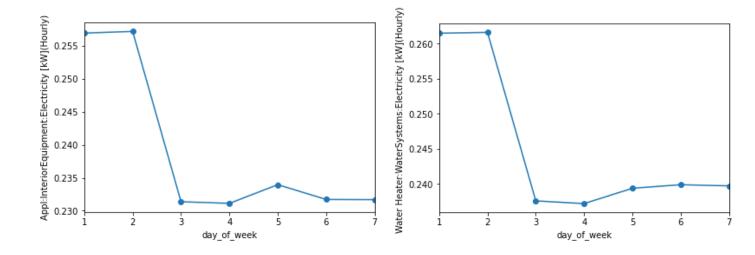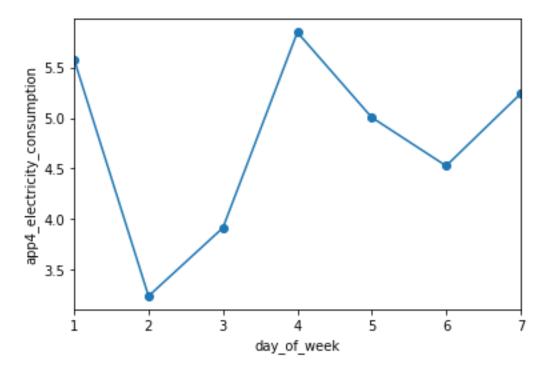
For app4, it functions between 10 am to 2 pm.

3. Summarize based on day of week

For gas facility consumption and misc electricity consumption, they both have a peak on Friday.

For appl and water heater, they have peak on Monday and Tuesday.

For app4, it has peak on Monday, Thursday and Sunday.

4. Summarize based on month

For fans and cooling electricity consumption, in line with intuition, they keep increasing during summer period.

And for water heater, it decreases during the summer period and has a rebounce since September.

For app4, it starts decreasing since August.