# ASSIGNMENT 2

## 1. PROCESS

- ✓ Split the "time" column in the "new.app4" file into three columns of date, hour and minutes.
- ✓ Aggregated newapp' s electricity usage based on split date and hour.
- ✓ Split the "Date.Time" column in the "USA_AL_Auburn-Opelika" file into tow columns of date and hour.
- ✓ Merged two files based on date and hour.
- ✓ Added up all the columns with "Kw" in the merged file to get the total electricity consumption for that date and hour.
- ✓ Output the merged file "mergeall.csv". The document is in the appendix a).

## 2. DATA VISUALIZATION

### 2.1 Hourly

Based on the merged file, we have calculated the distribution of electricity consumption projects.

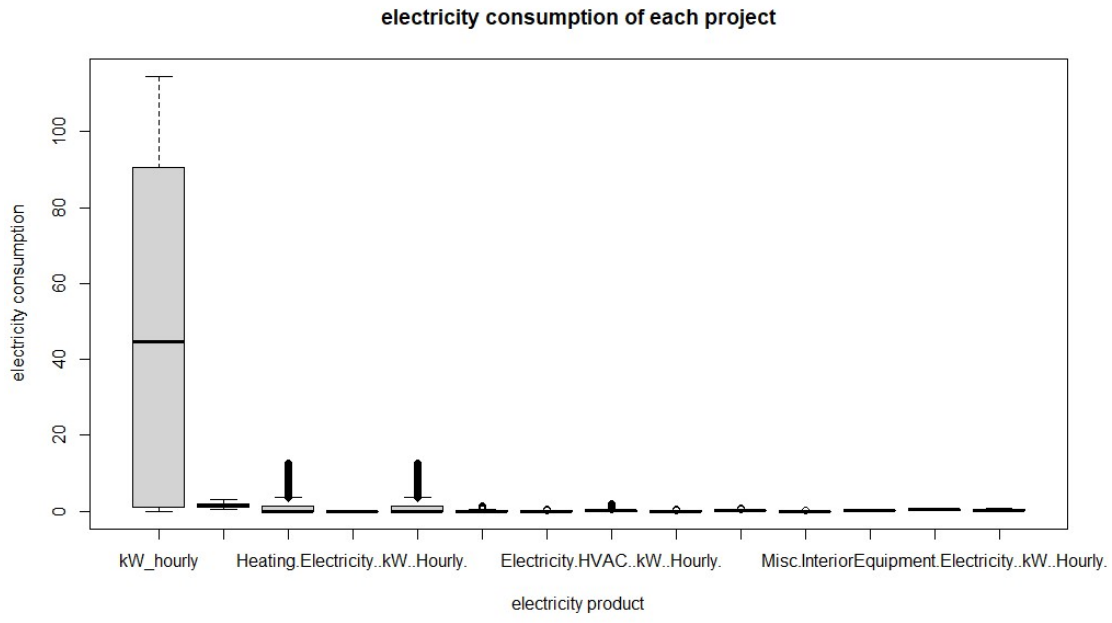


figure 2: boxplot of electricity consumption of each project hourly

From the figure, we can see the electricity consumption of each project. The difference between the electricity consumption of the newapp and other electricity consumption is obvious. The average hourly electricity consumption of newapp is

about 40kw hourly.

Then we counted the total electricity consumption according to different hours. The noon period is the peak period of electricity consumption, and the electricity consumption in the morning and evening is more average.

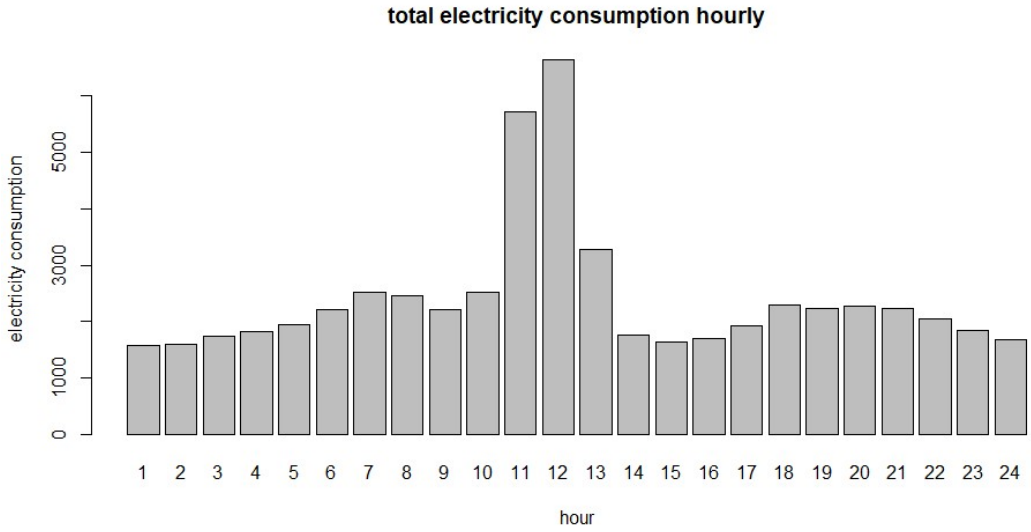


figure 3: bar plot of total electricity consumption hourly distribution

## 2.2 Monthly

According to different months, we have counted the total electricity consumption. Judging from the monthly total electricity consumption, there is a certain semi-annual periodicity. Electricity consumption decreased from January to May and rebounded rapidly in June. From July to November, it showed a downward trend, and began to rise after November.

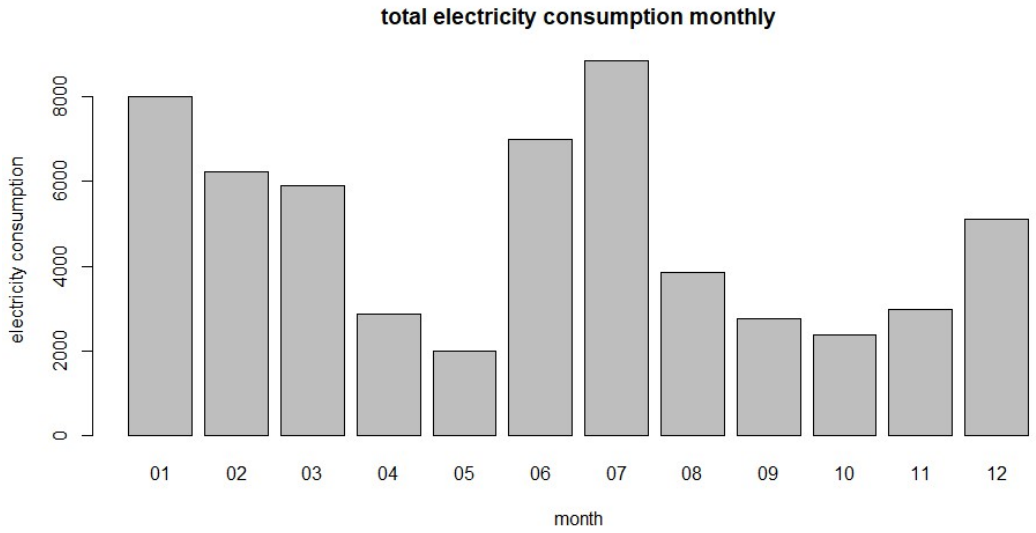


figure 4: bar plot of total electricity consumption monthly distribution

Then, we have drawn the electricity consumption of different electricity consumption products in each month.

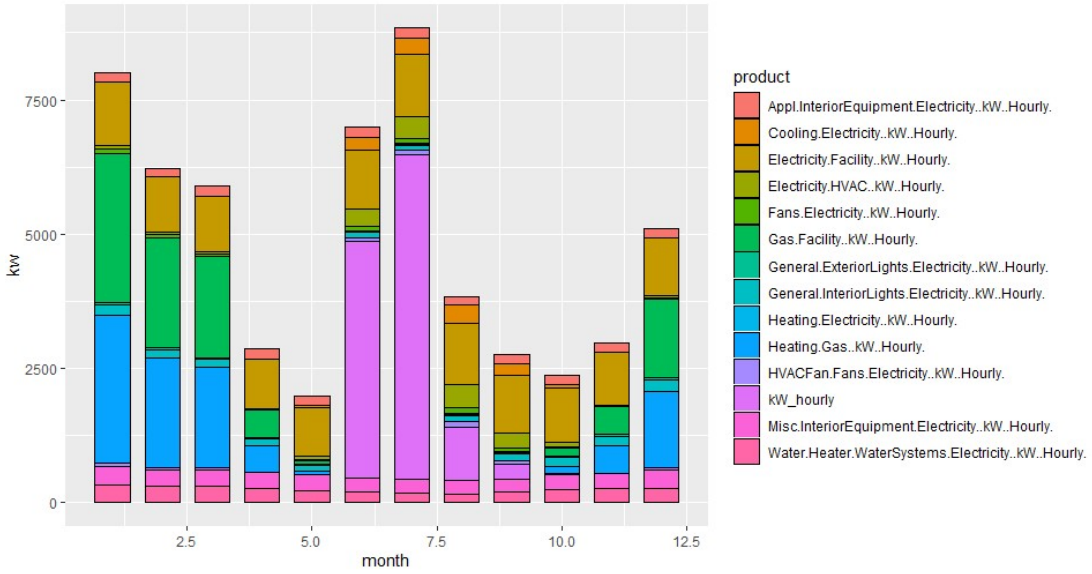


figure 5: Stacked chart of each electricity product monthly consumption

It can be seen that the electricity consumption of newapp mainly occurs between June and September. Consumption of water heater (pink) remain at similar levels throughout the year. Consumption of Heating (blue) occurs in cooler months (Q1 and Q4), on the contrary, consumption of cooling (orange) mainly occurs when it is warmer(June to September).

## 2.3 Weekday

We first draw the distribution of total electricity consumption during weekdays.

Electricity usage is similar from a weekly perspective.

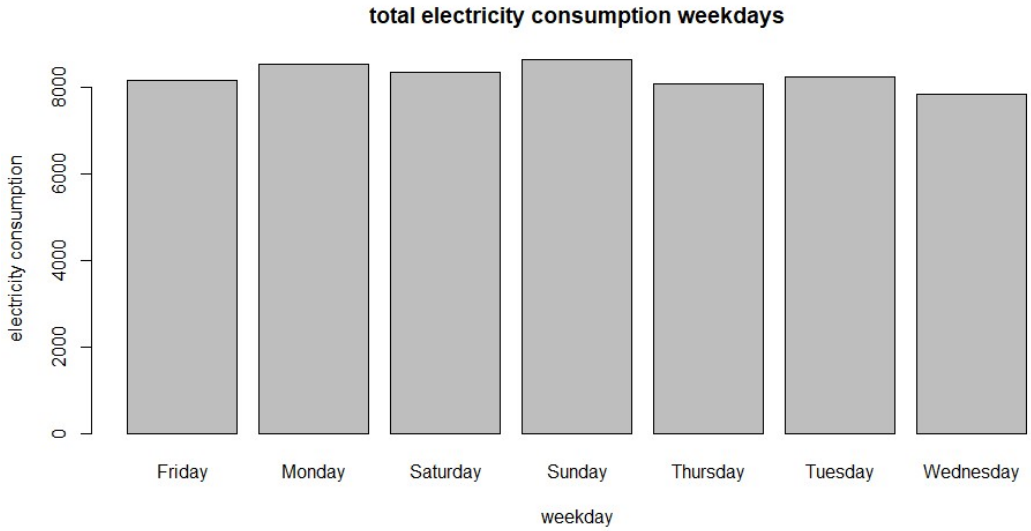


figure 6: bar plot of total electricity consumption weekday distribution

After that we take a look at each electricity product weekday distribution.

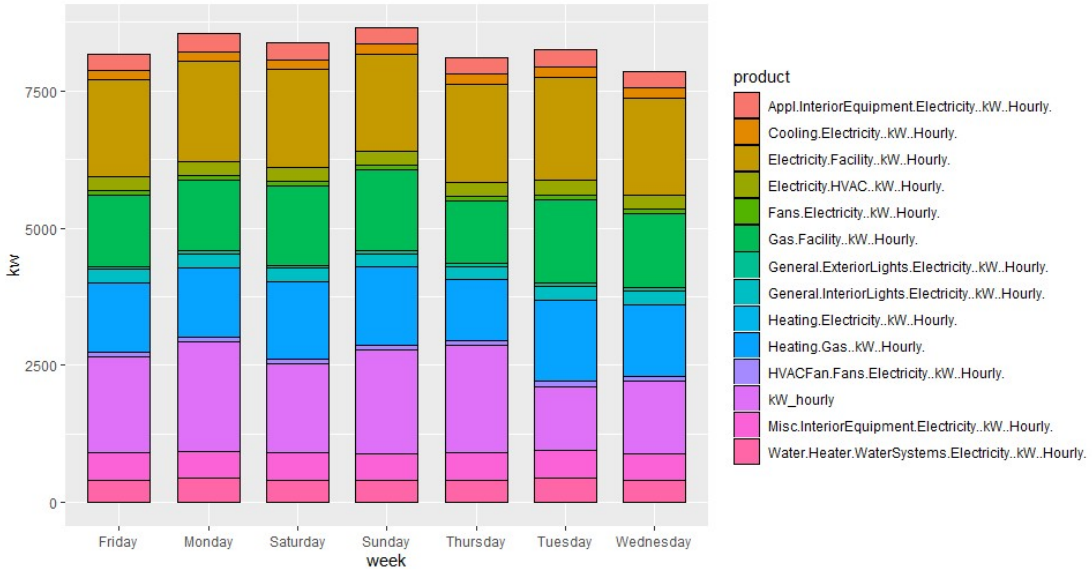


figure 7: stacked chart of each electricity product weekday consumption

The electricity consumption of each product is relatively uniform from the point of view of the week, and there is no drastic increase or decrease.

## 3. RESULTS

- although from an hourly perspective, whether there is a new app's electricity consumption has a great impact on the hourly electricity consumption. But looking at the monthly and weekly data, the newapp's electricity usage did not have an abnormal effect to total electricity consumption.

- monthly data shows a semi-annual cycle.
- Electricity usage is similar from a weekly perspective.