R2 - Visualization

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Date: 2020-02-26

```
library(readr)
library(ggplot2)
library(dplyr)
library(lubridate)
```

Prepare the data

```
url <-  "http://www.richardtwatson.com/data/ATLweather.csv"
w <- read_delim(url,delim=',')
```

```
## Parsed with column specification:
## cols(
##   Timestamp = col_datetime(format = ""),
##   Temperature = col_double(),
##   Humidity = col_double(),
##   Precipitation = col_double()
## )
```

```
url <-  "http://www.richardtwatson.com/data/electricityprices.csv"
e <- read_delim(url,delim=',')
```

```
## Parsed with column specification:
## cols(
##   timestamp = col_datetime(format = ""),
##   cost = col_double()
## )
```

```
m <- inner_join(w,e,by=c("Timestamp" = 'timestamp'))
```

a.

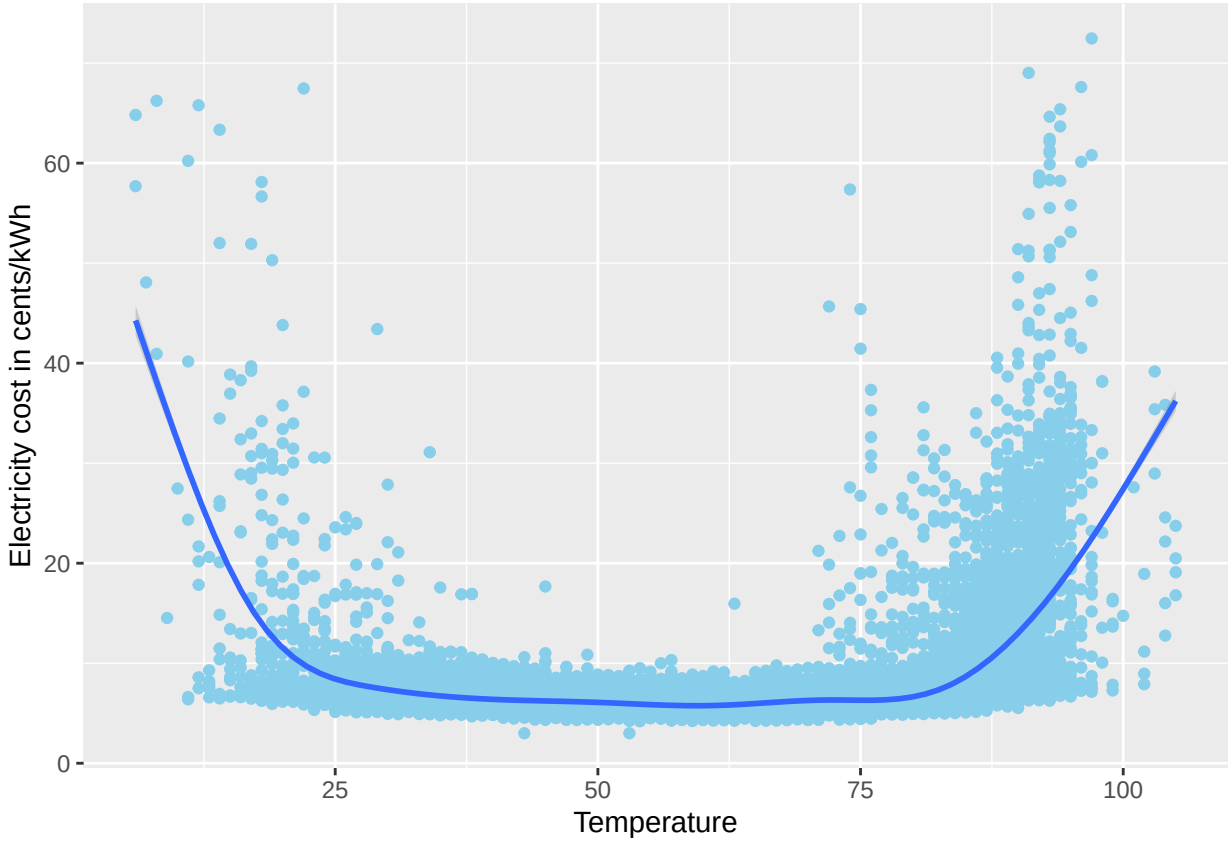
Graph the relationship between temperature and electricity price.

```
ggplot(m,aes(Temperature,cost)) +
  geom_point(color='skyblue') +
  geom_smooth() +
  xlab('Temperature') +
  ylab('Electricity cost in cents/kWh')
```

```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'

## Warning: Removed 6 rows containing non-finite values (stat_smooth).

## Warning: Removed 6 rows containing missing values (geom_point).
```



b.

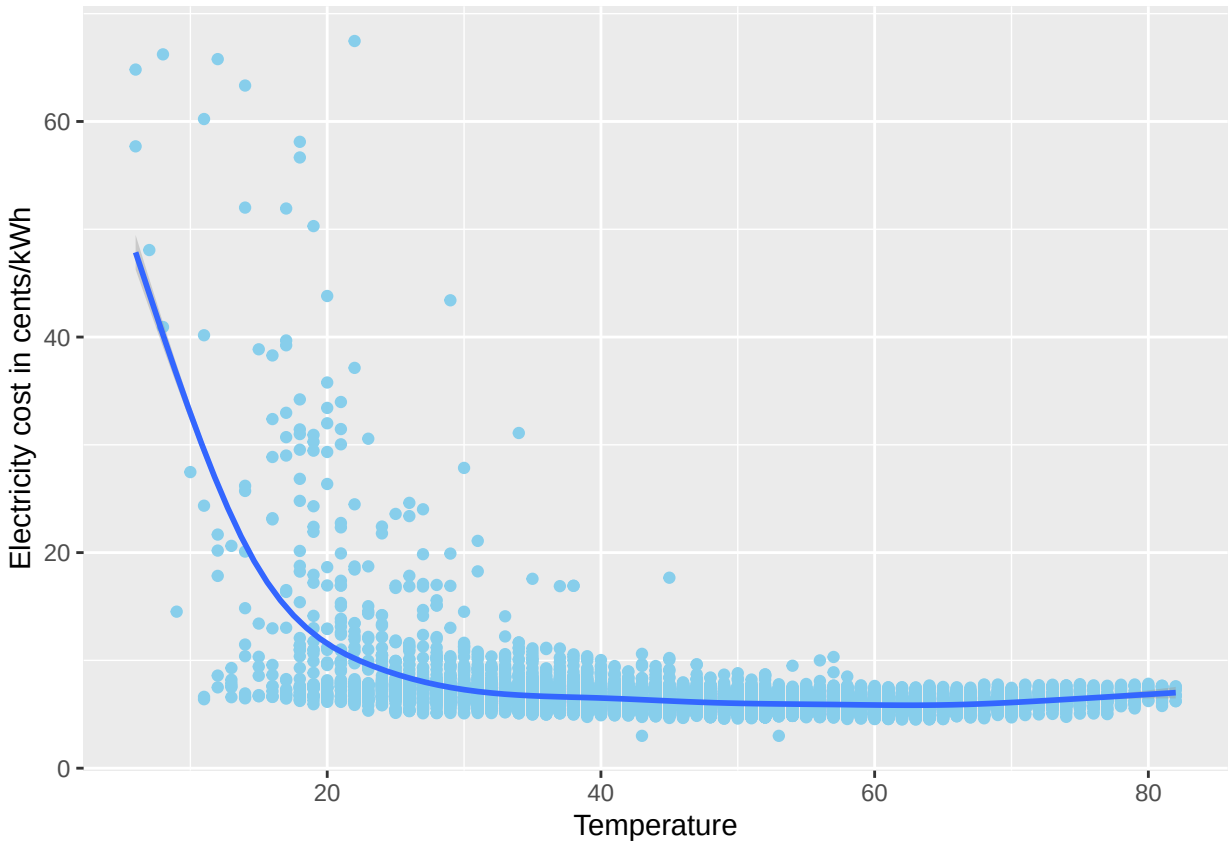
Graph the relationship between the temperature and electricity price for winter

```
period <- m %>% filter(month(Timestamp) >= 1 & month(Timestamp) <= 3)
ggplot(period,aes(Temperature,cost)) +
  geom_point(color='skyblue') +
  geom_smooth() +
  xlab('Temperature') +
  ylab('Electricity cost in cents/kWh')
```

```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'

## Warning: Removed 1 rows containing non-finite values (stat_smooth).

## Warning: Removed 1 rows containing missing values (geom_point).
```

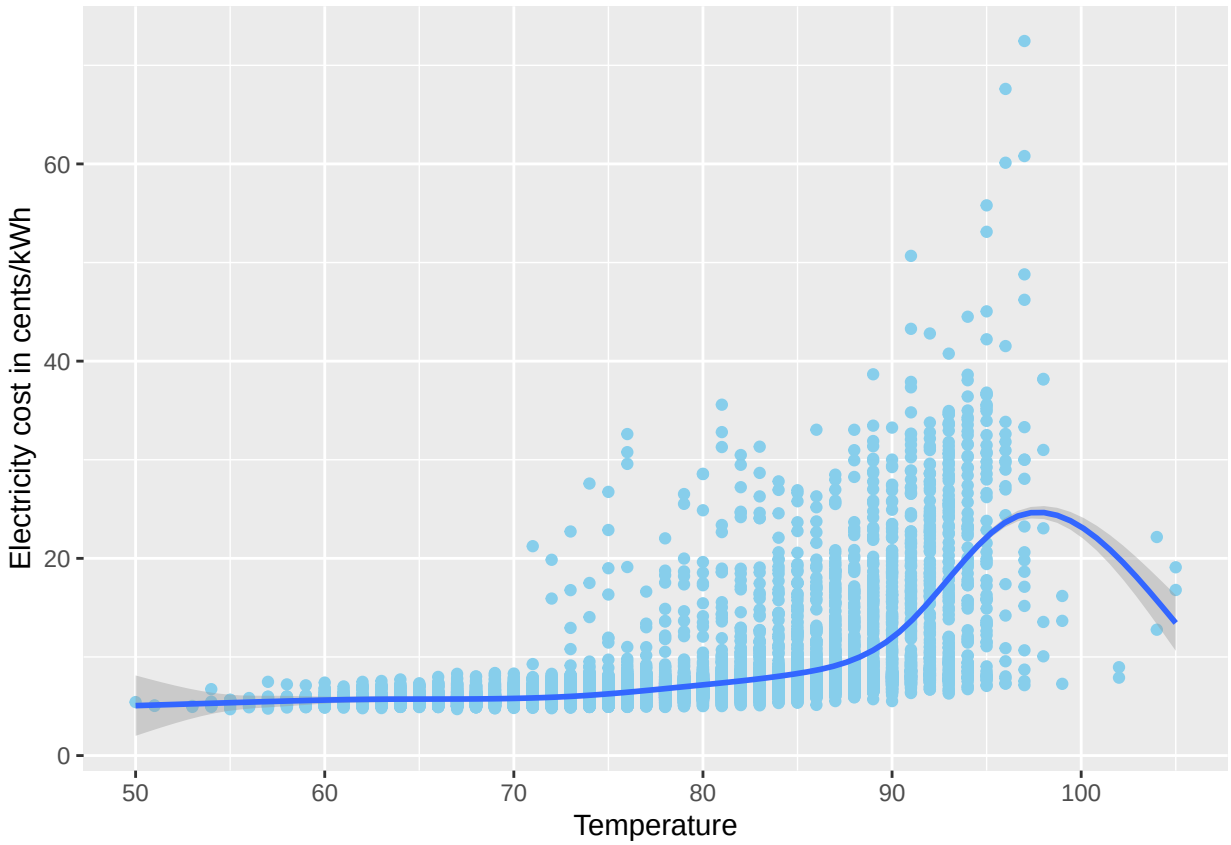


c.

Graph the relationship between the temperature and electricity price for summer

```
period <- m %>% filter(month(Timestamp) >= 7 & month(Timestamp) <= 9)
ggplot(period,aes(Temperature,cost)) +
  geom_point(color='skyblue') +
  geom_smooth() +
  xlab('Temperature') +
  ylab('Electricity cost in cents/kWh')
```

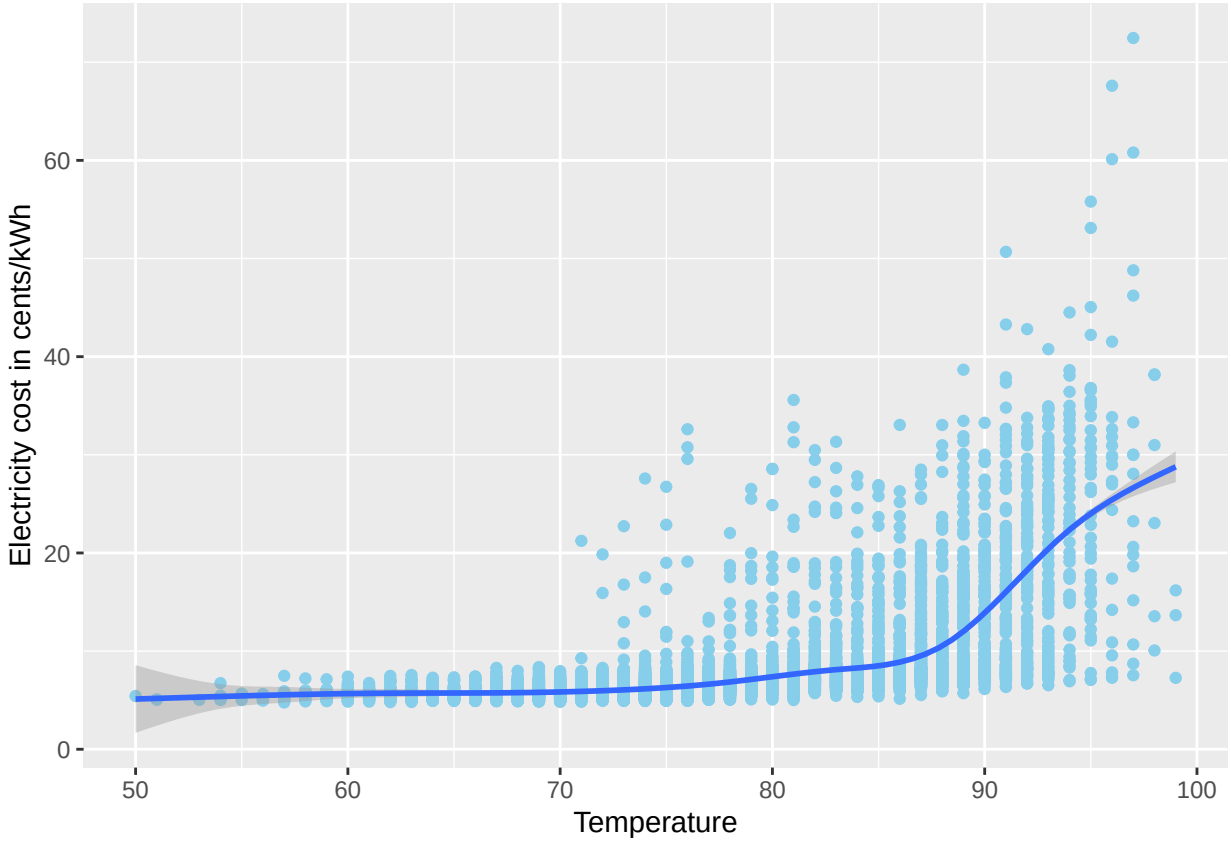
```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
```



How do you explain the anomaly in summer prices? Create a graph that supports your explanation.

```
period<- m %>% filter(month(Timestamp) >= 7 & month(Timestamp) <= 9 & wday(Timestamp) > 1 & wday(Timesta
ggplot(period,aes(Temperature,cost)) +
  geom_point(color='skyblue') +
  geom_smooth() +
  xlab('Temperature') +
  ylab('Electricity cost in cents/kWh')
```

```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
```



There is less electricity used on the weekends (days 1 and 7). The preceding graph with these values omitted shows the as temperature increases, prices increase.

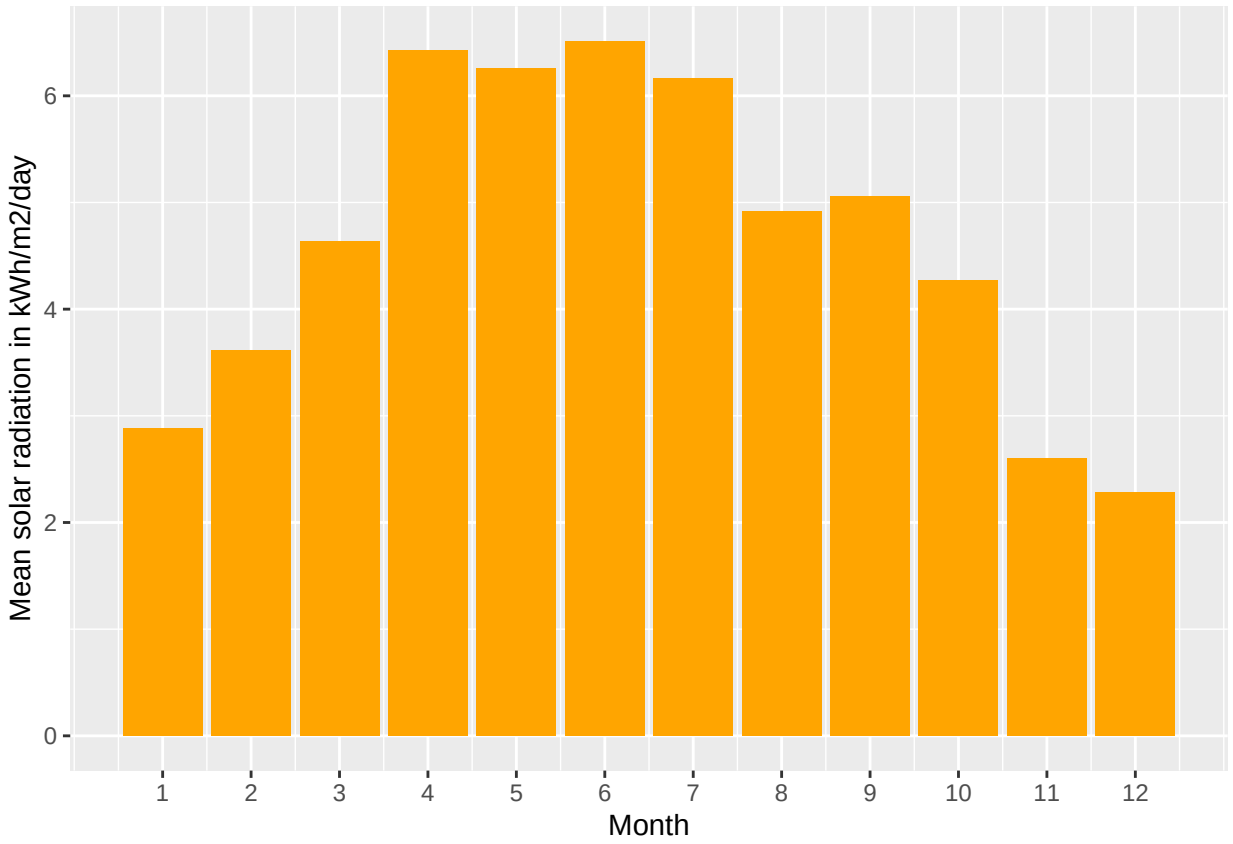
d.

Create a column (geom_col) chart showing average solar radiation for each month in kWh. Label the months 1 through 12 consecutively.

```
url <-  "http://www.richardtwatson.com/data/SolarRadiationAthens.csv"
s <- read_delim(url,delim=',')
```

```
## Parsed with column specification:
## cols(
##   TimeStamp = col_datetime(format = ""),
##   SolarWatt = col_double()
## )
```

```
s2 <- s %>%
  group_by(month = month(TimeStamp)) %>%
  summarize(MeanSolarWatt = mean(SolarWatt*24/1000))
ggplot(s2,aes(month,MeanSolarWatt)) +
  geom_col(fill='orange') +
  xlab('Month') +
  ylab('Mean solar radiation in kWh/m2/day') +
  scale_x_continuous(breaks = seq(1, 12, by = 1))
```


Mean solar radiation in kWh/m2/day
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
Month