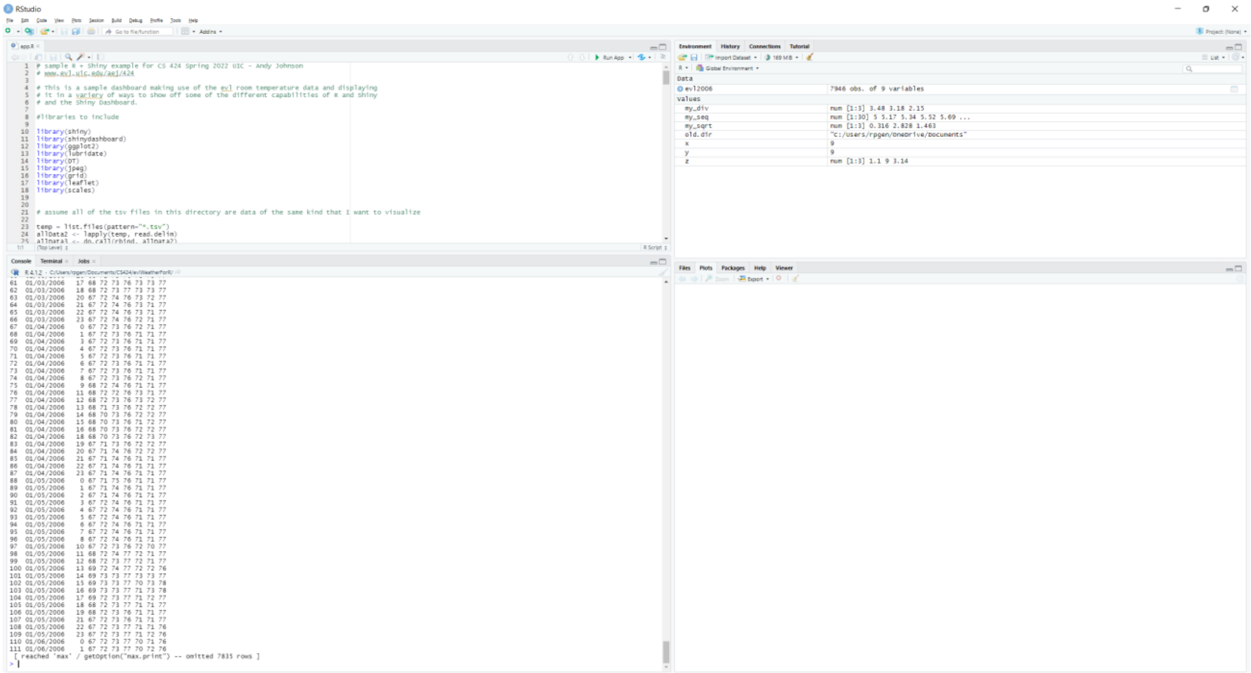
Results after “ evl2006 <- read.table(file – “history_2006.tsv”, sep = “/t”, header = TRUE) “ and “ evl2006 “ commands were executed:

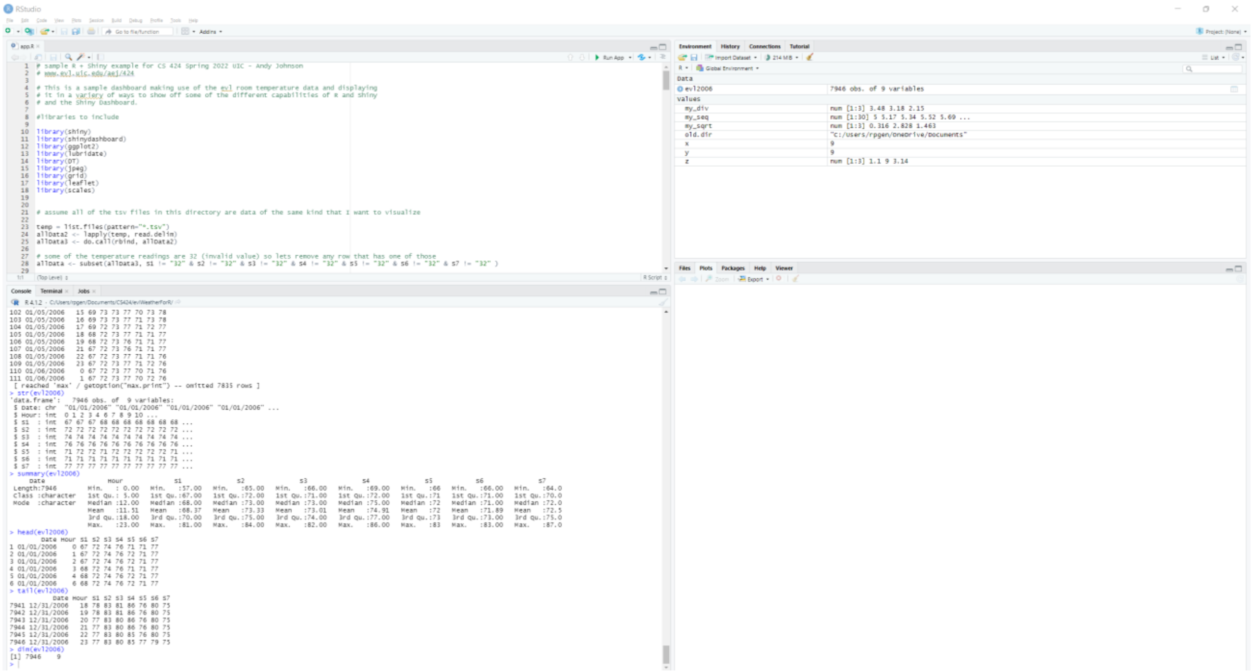


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)
```

```
Data
evl2006       7946 obs. of 9 variables
Values
  my_div      num [1:3] 3.48 3.18 2.15
  my_seq      num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt     num [1:3] 0.316 2.828 1.463
  old.dir     "C:/Users/rpgen/OneDrive/Documents"
  x           9
  y           9
  z           num [1:3] 1.1 9 3.14
```

```
61   01/03/2006   17 68 72 73 76 73 73 77
62   01/03/2006   18 68 72 73 77 73 73 77
63   01/03/2006   20 67 72 74 76 73 72 77
64   01/03/2006   21 67 72 74 76 73 71 77
65   01/03/2006   22 67 72 74 76 73 71 77
66   01/03/2006   23 67 72 74 76 72 71 77
67   01/04/2006    0 67 72 73 76 72 71 77
68   01/04/2006    1 67 72 73 76 71 71 77
69   01/04/2006    3 67 72 73 76 71 71 77
70   01/04/2006    4 67 72 73 76 71 71 77
71   01/04/2006    5 67 72 73 76 71 71 77
72   01/04/2006    6 67 72 73 76 71 71 77
73   01/04/2006    7 67 72 73 76 71 71 77
74   01/04/2006    8 67 72 73 76 72 71 77
75   01/04/2006    9 68 72 74 76 71 71 77
76   01/04/2006   11 68 72 72 76 73 71 77
77   01/04/2006   12 68 72 73 76 73 72 77
78   01/04/2006   13 68 71 73 76 72 72 77
79   01/04/2006   14 68 70 73 76 72 72 77
80   01/04/2006   15 68 70 73 76 71 72 77
81   01/04/2006   16 68 70 73 76 72 72 77
82   01/04/2006   18 68 70 73 76 72 73 77
83   01/04/2006   19 67 71 73 76 72 72 77
84   01/04/2006   20 67 71 74 76 72 72 77
85   01/04/2006   21 67 71 74 76 71 71 77
86   01/04/2006   22 67 71 74 76 71 71 77
87   01/04/2006   23 67 71 74 76 71 71 77
88   01/05/2006    0 67 71 75 76 71 71 77
89   01/05/2006    1 67 71 74 76 71 71 77
90   01/05/2006    2 67 71 74 76 71 71 77
91   01/05/2006    3 67 72 74 76 71 71 77
92   01/05/2006    4 67 72 74 76 71 71 77
93   01/05/2006    5 67 72 74 76 71 71 77
94   01/05/2006    6 67 72 74 76 71 71 77
95   01/05/2006    7 67 72 74 76 71 71 77
96   01/05/2006    8 67 72 74 76 71 71 77
97   01/05/2006   10 67 72 73 76 72 70 77
98   01/05/2006   11 68 72 74 77 72 71 77
99   01/05/2006   12 68 72 73 77 72 71 77
100 01/05/2006   13 69 72 74 77 72 72 76
101 01/05/2006   14 69 73 73 77 73 73 77
102 01/05/2006   15 69 73 73 77 70 73 78
103 01/05/2006   16 69 73 73 77 71 73 78
104 01/05/2006   17 69 72 73 77 71 72 77
105 01/05/2006   18 68 72 73 77 71 71 77
106 01/05/2006   19 68 72 73 76 71 71 77
107 01/05/2006   21 67 72 73 76 71 71 77
108 01/05/2006   22 67 72 73 77 71 71 76
109 01/05/2006   23 67 72 73 77 71 72 76
110 01/06/2006    0 67 72 73 77 70 71 76
111 01/06/2006    1 67 72 73 77 70 72 76
 [ reached 'max' / getOption("max.print") -- omitted 7835 rows ]
> 
```

Results after “str(evl2006)”, “summary(evl2006)”, “head(evl2006)”, “tail(evl2006)”, and “dim(evl2006)” commands were executed:

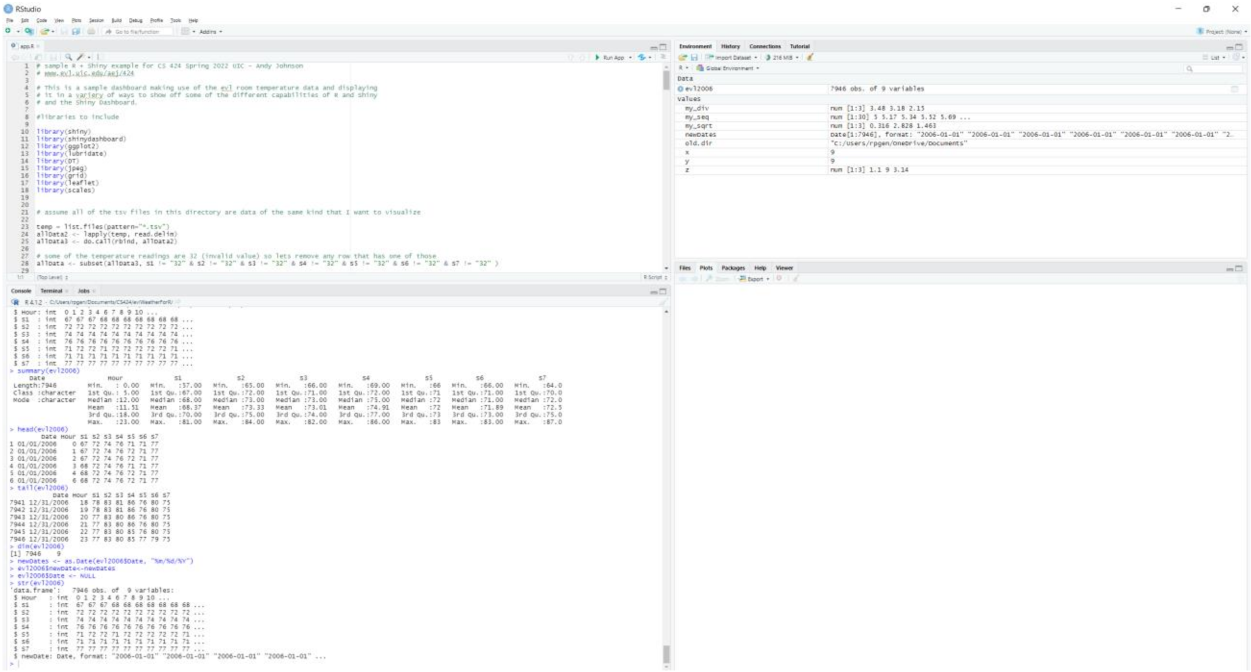


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, s1 != "32" & s2 != "32" & s3 != "32" & s4 != "32" & s5 != "32" & s6 != "32" & s7 != "32" )
```

```
Data
evl2006       7946 obs. of 9 variables
Values
  my_div      num [1:3] 3.48 3.18 2.15
  my_seq      num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt     num [1:3] 0.316 2.828 1.463
  old.dir     "C:/Users/rpgen/OneDrive/Documents"
  x           9
  y           9
  z           num [1:3] 1.1 9 3.14
```

```
102 01/05/2006   15 69 73 73 77 70 73 78
103 01/05/2006   16 69 73 73 77 71 73 78
104 01/05/2006   17 69 72 73 77 71 72 77
105 01/05/2006   18 68 72 73 77 71 71 77
106 01/05/2006   19 68 72 73 76 71 71 77
107 01/05/2006   21 67 72 73 76 71 71 77
108 01/05/2006   22 67 72 73 77 71 71 76
109 01/05/2006   23 67 72 73 77 71 72 76
110 01/06/2006    0 67 72 73 77 70 71 76
111 01/06/2006    1 67 72 73 77 70 72 76
 [ reached 'max' / getOption("max.print") -- omitted 7835 rows ]
> str(evl2006)
'data.frame':	7946 obs. of  9 variables:
 $ Date: chr  "01/01/2006" "01/01/2006" "01/01/2006" "01/01/2006" ...
 $ Hour: int  0 1 2 3 4 6 7 8 9 10 ...
 $ s1  : int  67 67 67 68 68 68 68 68 68 68 ...
 $ s2  : int  72 72 72 72 72 72 72 72 72 72 ...
 $ s3  : int  74 74 74 74 74 74 74 74 74 74 ...
 $ s4  : int  76 76 76 76 76 76 76 76 76 76 ...
 $ s5  : int  71 72 72 71 72 72 72 72 72 71 ...
 $ s6  : int  71 71 71 71 71 71 71 71 71 71 ...
 $ s7  : int  77 77 77 77 77 77 77 77 77 77 ...
> summary(evl2006)
     Date                Hour             s1              s2              s3              s4              s5           s6              s7      
 Length:7946        Min.   : 0.00   Min.   :57.00   Min.   :65.00   Min.   :66.00   Min.   :69.00   Min.   :66   Min.   :66.00   Min.   :64.0  
 Class :character   1st Qu.: 5.00   1st Qu.:67.00   1st Qu.:72.00   1st Qu.:71.00   1st Qu.:72.00   1st Qu.:71   1st Qu.:71.00   1st Qu.:70.0  
 Mode  :character   Median :12.00   Median :68.00   Median :73.00   Median :73.00   Median :75.00   Median :72   Median :71.00   Median :72.0  
                    Mean   :11.51   Mean   :68.37   Mean   :73.33   Mean   :73.01   Mean   :74.91   Mean   :72   Mean   :71.89   Mean   :72.5  
                    3rd Qu.:18.00   3rd Qu.:70.00   3rd Qu.:75.00   3rd Qu.:74.00   3rd Qu.:77.00   3rd Qu.:73   3rd Qu.:73.00   3rd Qu.:75.0  
                    Max.   :23.00   Max.   :81.00   Max.   :84.00   Max.   :82.00   Max.   :86.00   Max.   :83   Max.   :83.00   Max.   :87.0  
> head(evl2006)
        Date Hour s1 s2 s3 s4 s5 s6 s7
1 01/01/2006    0 67 72 74 76 71 71 77
2 01/01/2006    1 67 72 74 76 72 71 77
3 01/01/2006    2 67 72 74 76 72 71 77
4 01/01/2006    3 68 72 74 76 71 71 77
5 01/01/2006    4 68 72 74 76 72 71 77
6 01/01/2006    6 68 72 74 76 72 71 77
> tail(evl2006)
           Date Hour s1 s2 s3 s4 s5 s6 s7
7941 12/31/2006   18 78 83 81 86 76 80 75
7942 12/31/2006   19 78 83 81 86 76 80 75
7943 12/31/2006   20 77 83 80 86 76 80 75
7944 12/31/2006   21 77 83 80 86 76 80 75
7945 12/31/2006   22 77 83 80 85 76 80 75
7946 12/31/2006   23 77 83 80 85 77 79 75
> dim(evl2006)
[1] 7946    9
> 
```

Results after “newDates <- as.Date(evl2006$Date, "%m/%d/%Y")”, “evl2006$newDate<-newDates”, “evl2006$Date <- NULL”, and “str(evl2006)” commands executed:

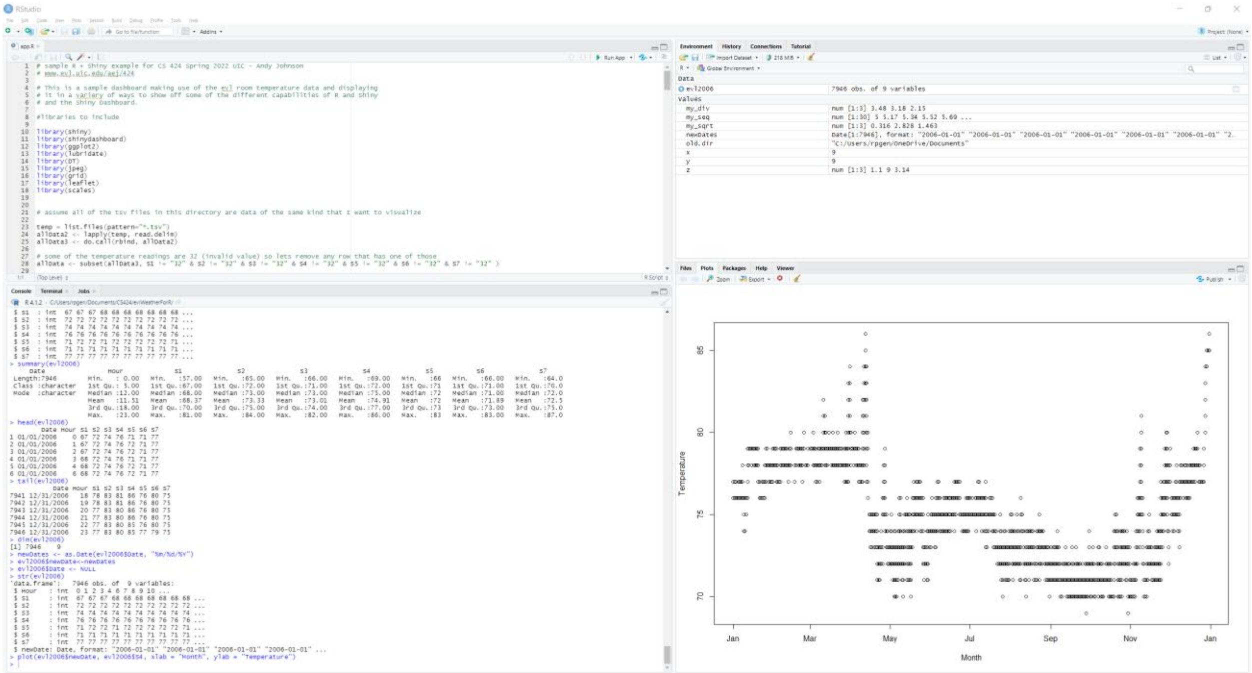


```r
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )

```

```
Data
evl2006        7946 obs. of 9 variables
Values
  my_div       num [1:3] 3.48 3.18 2.15
  my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt      num [1:3] 0.316 2.828 1.463
  newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2.
  old.dir      "C:/Users/rpgen/OneDrive/Documents"
  x            9
  y            9
  z            num [1:3] 1.1 9 3.14
```

```
 $ Hour: int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1  : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2  : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3  : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4  : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5  : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6  : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7  : int  77 77 77 77 77 77 77 77 77 77 ...
> summary(evl2006)
     Date                Hour             S1              S2              S3              S4             S5           S6              S7
 Length:7946        Min.   : 0.00   Min.   :57.00   Min.   :65.00   Min.   :66.00   Min.   :69.00   Min.   :66   Min.   :66.00   Min.   :64.0
 Class :character   1st Qu.: 5.00   1st Qu.:67.00   1st Qu.:72.00   1st Qu.:71.00   1st Qu.:72.00   1st Qu.:71   1st Qu.:71.00   1st Qu.:70.0
 Mode  :character   Median :12.00   Median :68.00   Median :73.00   Median :73.00   Median :75.00   Median :72   Median :71.00   Median :72.0
                    Mean   :11.51   Mean   :68.37   Mean   :73.33   Mean   :73.01   Mean   :74.91   Mean   :72   Mean   :71.89   Mean   :72.5
                    3rd Qu.:18.00   3rd Qu.:70.00   3rd Qu.:75.00   3rd Qu.:74.00   3rd Qu.:77.00   3rd Qu.:73   3rd Qu.:73.00   3rd Qu.:75.0
                    Max.   :23.00   Max.   :81.00   Max.   :84.00   Max.   :82.00   Max.   :86.00   Max.   :83   Max.   :83.00   Max.   :87.0
> head(evl2006)
        Date Hour S1 S2 S3 S4 S5 S6 S7
1 01/01/2006    0 67 72 74 76 71 71 77
2 01/01/2006    1 67 72 74 76 72 71 77
3 01/01/2006    2 67 72 74 76 72 71 77
4 01/01/2006    3 68 72 74 76 71 71 77
5 01/01/2006    4 68 72 74 76 72 71 77
6 01/01/2006    6 68 72 74 76 72 71 77
> tail(evl2006)
           Date Hour S1 S2 S3 S4 S5 S6 S7
7941 12/31/2006   18 78 83 81 86 76 80 75
7942 12/31/2006   19 78 83 81 86 76 80 75
7943 12/31/2006   20 77 83 80 86 76 80 75
7944 12/31/2006   21 77 83 80 86 76 80 75
7945 12/31/2006   22 77 83 80 85 76 80 75
7946 12/31/2006   23 77 83 80 85 77 79 75
> dim(evl2006)
[1] 7946    9
> newDates <- as.Date(evl2006$Date, "%m/%d/%Y")
> evl2006$newDate<-newDates
> evl2006$Date <- NULL
> str(evl2006)
'data.frame':   7946 obs. of  9 variables:
 $ Hour   : int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1     : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2     : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> 
```

Results after “plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")” command was executed:

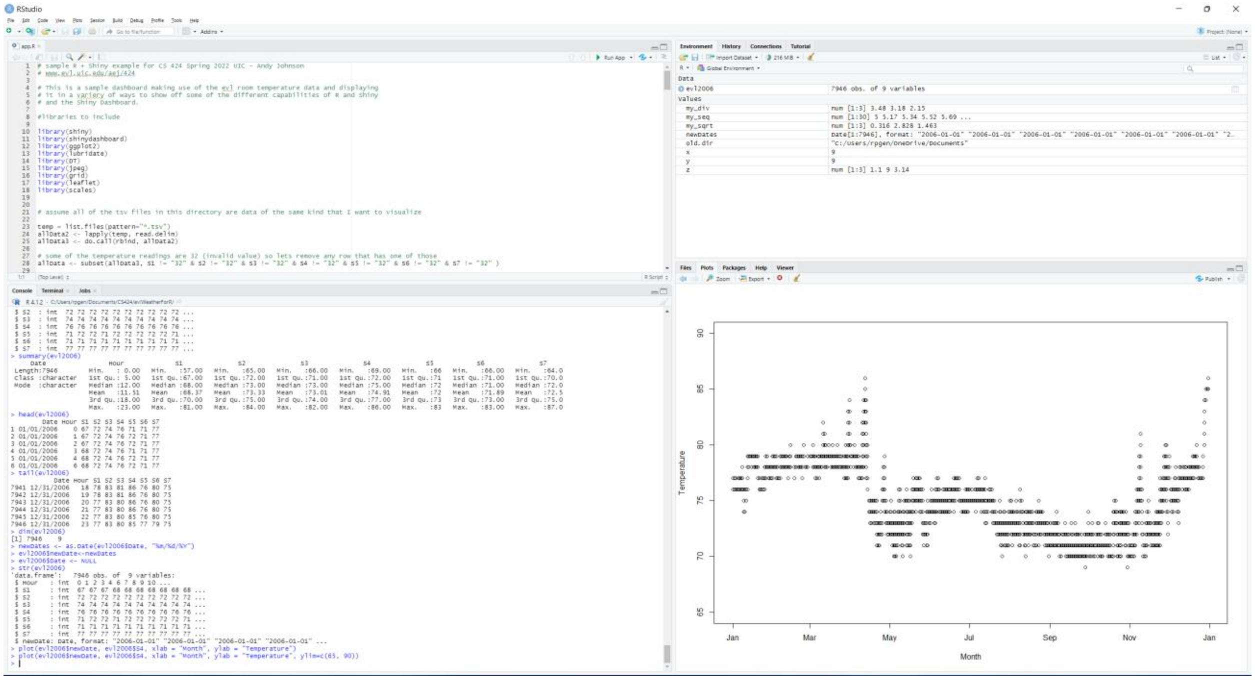


```r
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )

```

```
Data
evl2006        7946 obs. of 9 variables
Values
  my_div       num [1:3] 3.48 3.18 2.15
  my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt      num [1:3] 0.316 2.828 1.463
  newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2.
  old.dir      "C:/Users/rpgen/OneDrive/Documents"
  x            9
  y            9
  z            num [1:3] 1.1 9 3.14
```

```
 $ S1  : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2  : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3  : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4  : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5  : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6  : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7  : int  77 77 77 77 77 77 77 77 77 77 ...
> summary(evl2006)
     Date                Hour             S1              S2              S3              S4             S5           S6              S7
 Length:7946        Min.   : 0.00   Min.   :57.00   Min.   :65.00   Min.   :66.00   Min.   :69.00   Min.   :66   Min.   :66.00   Min.   :64.0
 Class :character   1st Qu.: 5.00   1st Qu.:67.00   1st Qu.:72.00   1st Qu.:71.00   1st Qu.:72.00   1st Qu.:71   1st Qu.:71.00   1st Qu.:70.0
 Mode  :character   Median :12.00   Median :68.00   Median :73.00   Median :73.00   Median :75.00   Median :72   Median :71.00   Median :72.0
                    Mean   :11.51   Mean   :68.37   Mean   :73.33   Mean   :73.01   Mean   :74.91   Mean   :72   Mean   :71.89   Mean   :72.5
                    3rd Qu.:18.00   3rd Qu.:70.00   3rd Qu.:75.00   3rd Qu.:74.00   3rd Qu.:77.00   3rd Qu.:73   3rd Qu.:73.00   3rd Qu.:75.0
                    Max.   :23.00   Max.   :81.00   Max.   :84.00   Max.   :82.00   Max.   :86.00   Max.   :83   Max.   :83.00   Max.   :87.0
> head(evl2006)
        Date Hour S1 S2 S3 S4 S5 S6 S7
1 01/01/2006    0 67 72 74 76 71 71 77
2 01/01/2006    1 67 72 74 76 72 71 77
3 01/01/2006    2 67 72 74 76 72 71 77
4 01/01/2006    3 68 72 74 76 71 71 77
5 01/01/2006    4 68 72 74 76 72 71 77
6 01/01/2006    6 68 72 74 76 72 71 77
> tail(evl2006)
           Date Hour S1 S2 S3 S4 S5 S6 S7
7941 12/31/2006   18 78 83 81 86 76 80 75
7942 12/31/2006   19 78 83 81 86 76 80 75
7943 12/31/2006   20 77 83 80 86 76 80 75
7944 12/31/2006   21 77 83 80 86 76 80 75
7945 12/31/2006   22 77 83 80 85 76 80 75
7946 12/31/2006   23 77 83 80 85 77 79 75
> dim(evl2006)
[1] 7946    9
> newDates <- as.Date(evl2006$Date, "%m/%d/%Y")
> evl2006$newDate<-newDates
> evl2006$Date <- NULL
> str(evl2006)
'data.frame':   7946 obs. of  9 variables:
 $ Hour   : int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1     : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2     : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> 
```

Results after “plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))” command was executed:

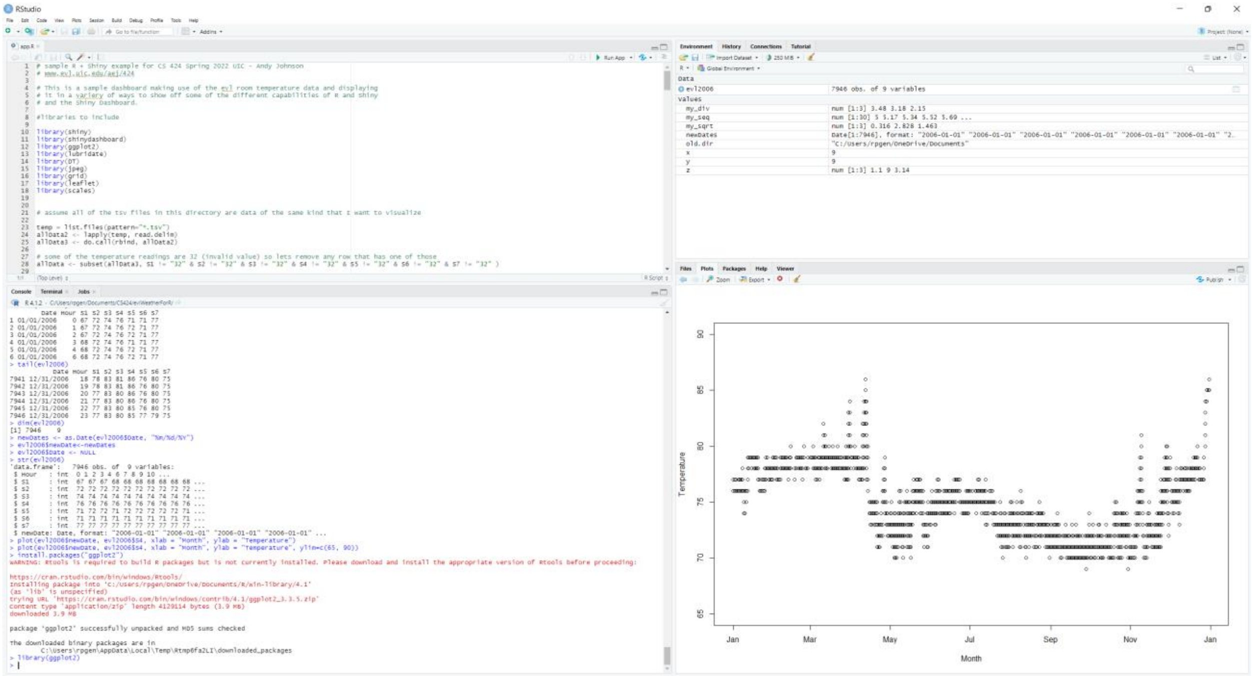


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
 $ S2  : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3  : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4  : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5  : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6  : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7  : int  77 77 77 77 77 77 77 77 77 77 ...
> summary(evl2006)
     Date               Hour             S1              S2              S3              S4              S5           S6              S7
 Length:7946        Min.   : 0.00   Min.   :57.00   Min.   :65.00   Min.   :66.00   Min.   :69.00   Min.   :66   Min.   :66.00   Min.   :64.0
 Class :character   1st Qu.: 5.00   1st Qu.:67.00   1st Qu.:72.00   1st Qu.:71.00   1st Qu.:72.00   1st Qu.:71   1st Qu.:71.00   1st Qu.:70.0
 Mode  :character   Median :12.00   Median :68.00   Median :73.00   Median :73.00   Median :75.00   Median :72   Median :71.00   Median :72.0
                    Mean   :11.51   Mean   :68.37   Mean   :73.33   Mean   :73.01   Mean   :74.91   Mean   :72   Mean   :71.89   Mean   :72.5
                    3rd Qu.:18.00   3rd Qu.:70.00   3rd Qu.:75.00   3rd Qu.:74.00   3rd Qu.:77.00   3rd Qu.:73   3rd Qu.:73.00   3rd Qu.:75.0
                    Max.   :23.00   Max.   :81.00   Max.   :84.00   Max.   :82.00   Max.   :86.00   Max.   :83   Max.   :83.00   Max.   :87.0
> head(evl2006)
        Date Hour S1 S2 S3 S4 S5 S6 S7
1 01/01/2006    0 67 72 74 76 71 71 77
2 01/01/2006    1 67 72 74 76 72 71 77
3 01/01/2006    2 67 72 74 76 72 71 77
4 01/01/2006    3 68 72 74 76 71 71 77
5 01/01/2006    4 68 72 74 76 72 71 77
6 01/01/2006    6 68 72 74 76 72 71 77
> tail(evl2006)
           Date Hour S1 S2 S3 S4 S5 S6 S7
7941 12/31/2006   18 78 83 81 86 76 80 75
7942 12/31/2006   19 78 83 81 86 76 80 75
7943 12/31/2006   20 77 83 80 86 76 80 75
7944 12/31/2006   21 77 83 80 86 76 80 75
7945 12/31/2006   22 77 83 80 85 76 80 75
7946 12/31/2006   23 77 83 80 85 77 79 75
> dim(evl2006)
[1] 7946    9
> newDates <- as.Date(evl2006$Date, "%m/%d/%Y")
> evl2006$newDate<-newDates
> evl2006$Date <- NULL
> str(evl2006)
'data.frame':	7946 obs. of  9 variables:
 $ Hour   : int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1     : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2     : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))
> 
```

```
Data
evl2006        7946 obs. of 9 variables
Values
  my_div       num [1:3] 3.48 3.18 2.15
  my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt      num [1:3] 0.316 2.828 1.463
  newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir      "C:/Users/rpgen/OneDrive/Documents"
  x            9
  y            9
  z            num [1:3] 1.1 9 3.14
```

Results after installing ggplot2:

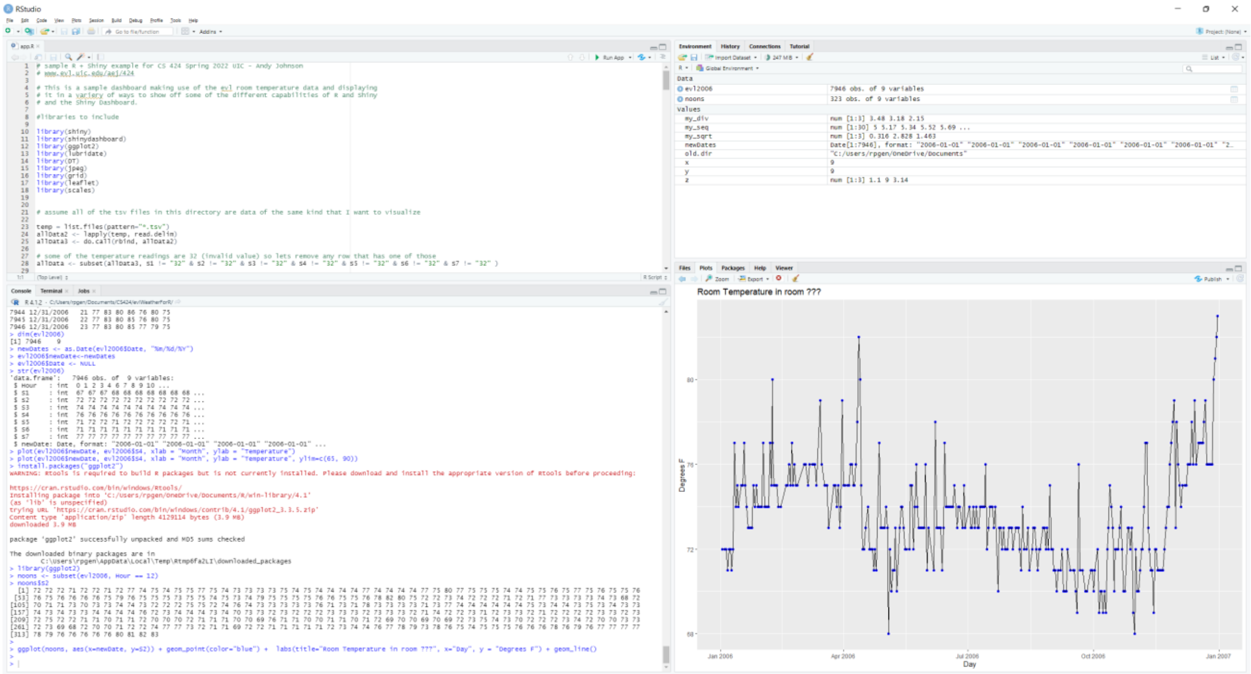


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
        Date Hour S1 S2 S3 S4 S5 S6 S7
1 01/01/2006    0 67 72 74 76 71 71 77
2 01/01/2006    1 67 72 74 76 72 71 77
3 01/01/2006    2 67 72 74 76 72 71 77
4 01/01/2006    3 68 72 74 76 71 71 77
5 01/01/2006    4 68 72 74 76 72 71 77
6 01/01/2006    6 68 72 74 76 72 71 77
> tail(evl2006)
           Date Hour S1 S2 S3 S4 S5 S6 S7
7941 12/31/2006   18 78 83 81 86 76 80 75
7942 12/31/2006   19 78 83 81 86 76 80 75
7943 12/31/2006   20 77 83 80 86 76 80 75
7944 12/31/2006   21 77 83 80 86 76 80 75
7945 12/31/2006   22 77 83 80 85 76 80 75
7946 12/31/2006   23 77 83 80 85 77 79 75
> dim(evl2006)
[1] 7946    9
> newDates <- as.Date(evl2006$Date, "%m/%d/%Y")
> evl2006$newDate<-newDates
> evl2006$Date <- NULL
> str(evl2006)
'data.frame':	7946 obs. of  9 variables:
 $ Hour   : int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1     : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2     : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))
> install.packages("ggplot2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/ggplot2_3.3.5.zip'
Content type 'application/zip' length 4129114 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
	C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> 
```

```
Data
evl2006        7946 obs. of 9 variables
Values
  my_div       num [1:3] 3.48 3.18 2.15
  my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt      num [1:3] 0.316 2.828 1.463
  newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir      "C:/Users/rpgen/OneDrive/Documents"
  x            9
  y            9
  z            num [1:3] 1.1 9 3.14
```

Results to test out ggplot2: (no aesthetic changes yet)

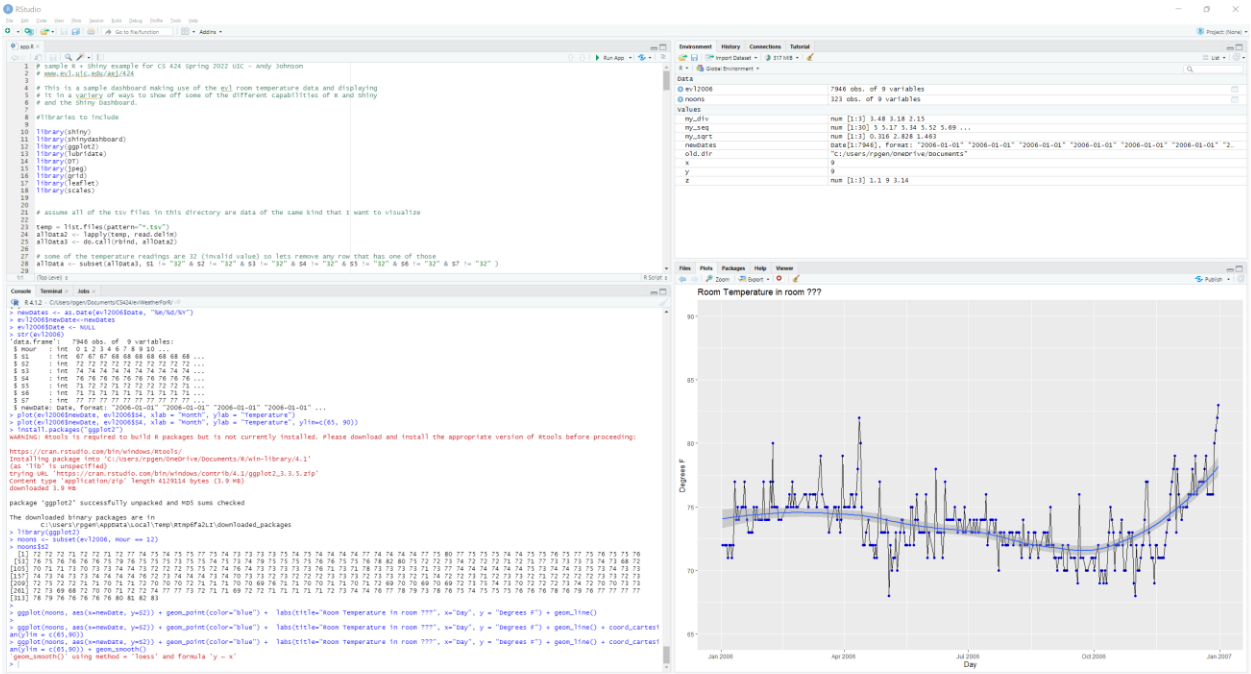


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evl/WeatherForR/
7944 12/31/2006   21 77 83 80 86 76 80 75
7945 12/31/2006   22 77 83 80 85 76 80 75
7946 12/31/2006   23 77 83 80 85 77 79 75
> dim(evl2006)
[1] 7946    9
> newDates <- as.Date(evl2006$Date, "%m/%d/%Y")
> evl2006$newDate<-newDates
> evl2006$Date <- NULL
> str(evl2006)
'data.frame':   7946 obs. of  9 variables:
 $ Hour   : int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1     : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2     : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))
> install.packages("ggplot2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/ggplot2_3.3.5.zip'
Content type 'application/zip' length 4129114 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> |
```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
my_div       num [1:3] 3.48 3.18 2.15
my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt      num [1:3] 0.316 2.828 1.463
newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir      "C:/Users/rpgen/OneDrive/Documents"
x            9
y            9
z            num [1:3] 1.1 9 3.14
```

Results after adding in the min and max, along with a smooth line through the data

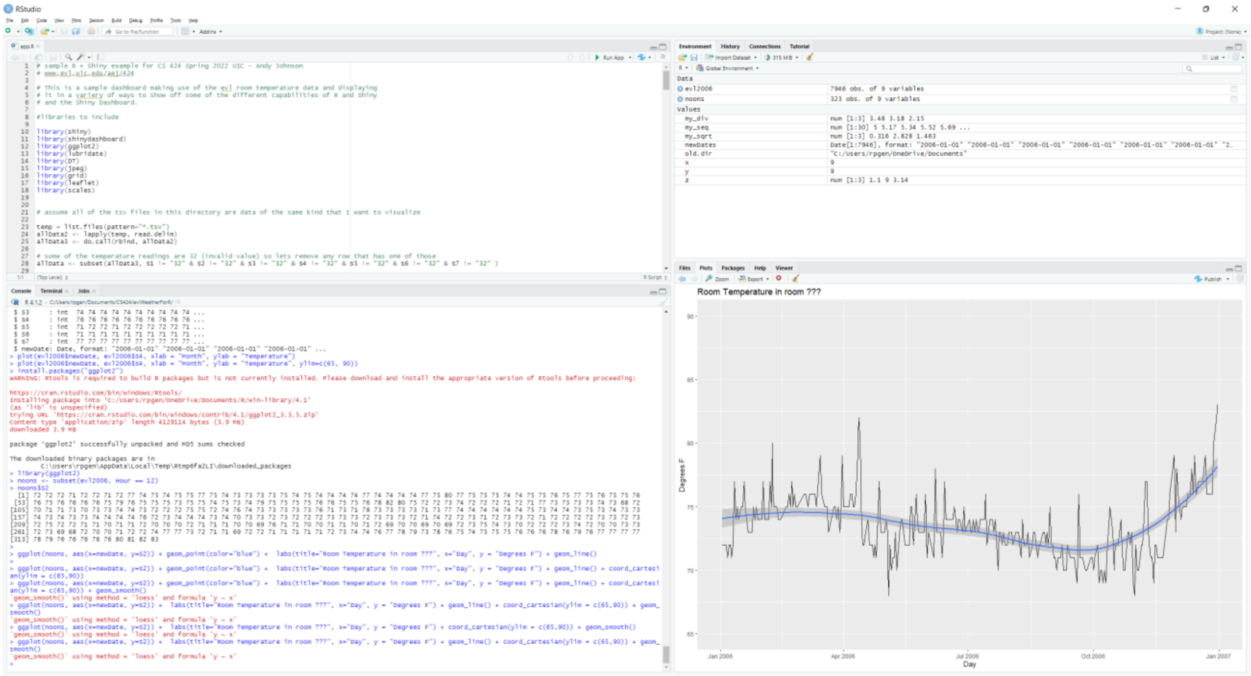


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evl/WeatherForR/
> newDates <- as.Date(evl2006$Date, "%m/%d/%Y")
> evl2006$newDate<-newDates
> evl2006$Date <- NULL
> str(evl2006)
'data.frame':   7946 obs. of  9 variables:
 $ Hour   : int  0 1 2 3 4 6 7 8 9 10 ...
 $ S1     : int  67 67 67 68 68 68 68 68 68 68 ...
 $ S2     : int  72 72 72 72 72 72 72 72 72 72 ...
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))
> install.packages("ggplot2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/ggplot2_3.3.5.zip'
Content type 'application/zip' length 4129114 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> |
```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
my_div       num [1:3] 3.48 3.18 2.15
my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt      num [1:3] 0.316 2.828 1.463
newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir      "C:/Users/rpgen/OneDrive/Documents"
x            9
y            9
z            num [1:3] 1.1 9 3.14
```

Results after the removal of points:

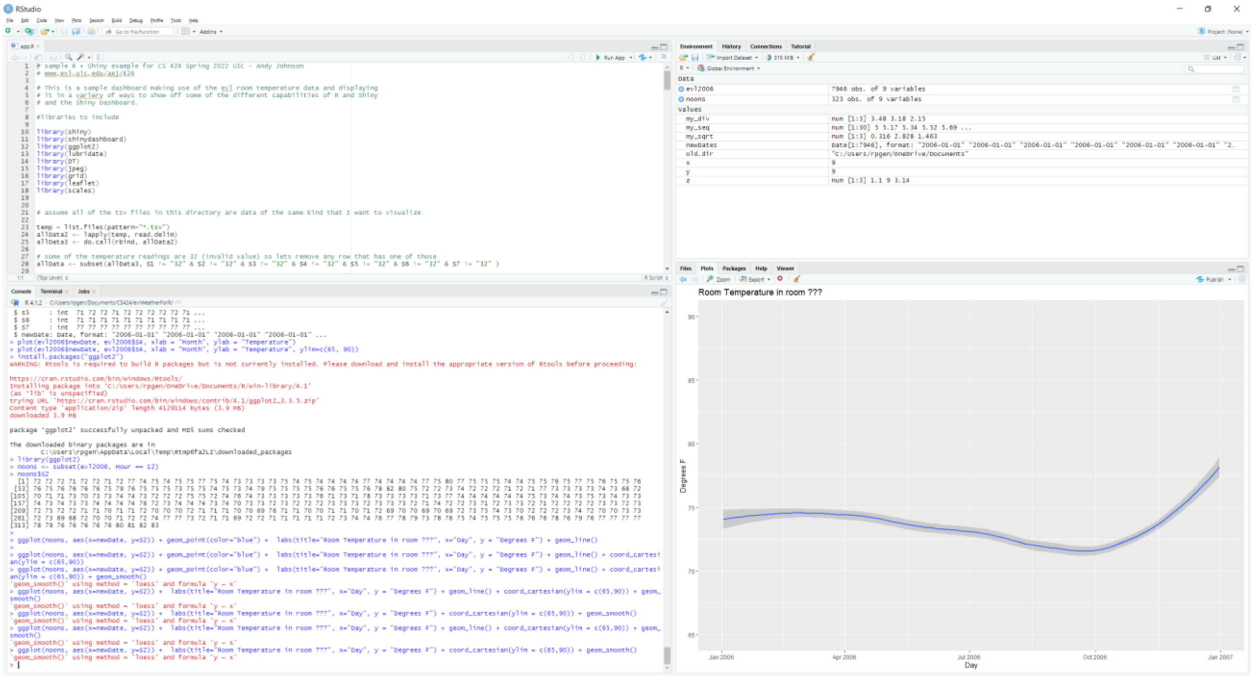


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )

```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
my_div       num [1:3] 3.48 3.18 2.15
my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt      num [1:3] 0.316 2.828 1.463
newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir      "C:/Users/rpgen/OneDrive/Documents"
x            9
y            9
z            num [1:3] 1.1 9 3.14
```

```
 $ S3     : int  74 74 74 74 74 74 74 74 74 74 ...
 $ S4     : int  76 76 76 76 76 76 76 76 76 76 ...
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))
> install.packages("ggplot2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/ggplot2_3.3.5.zip'
Content type 'application/zip' length 4129114 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
> 
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
> 
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> 
```

Results after the removal of everything on the graph except the smooth line:

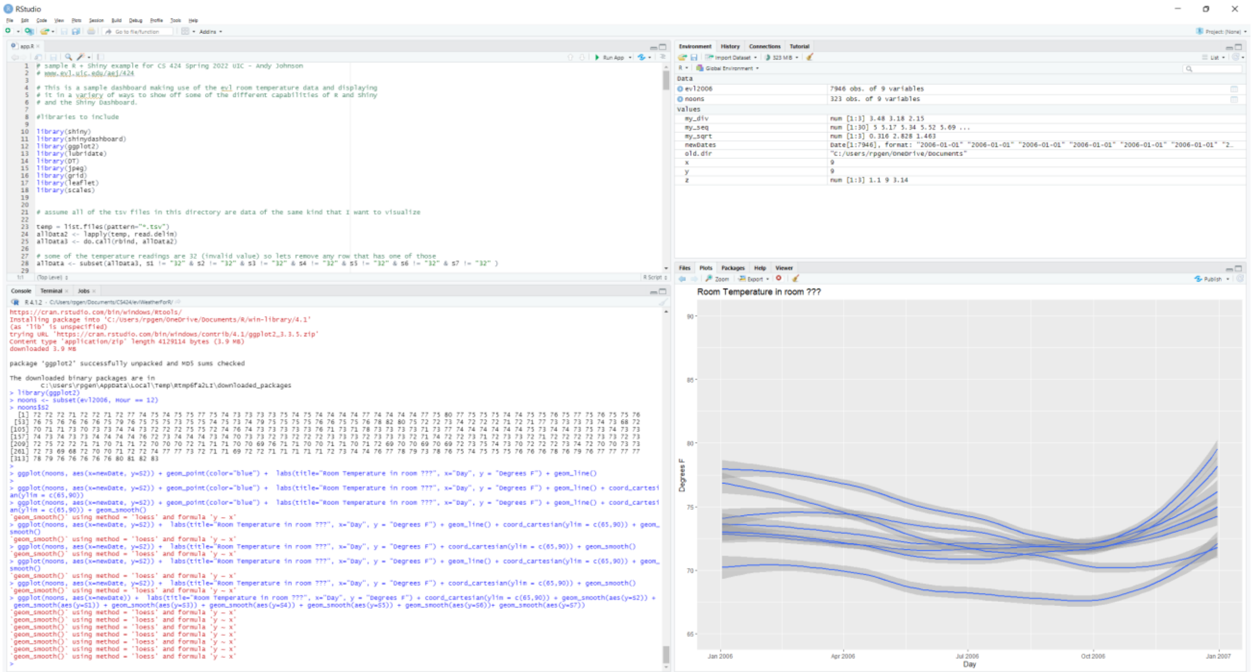


```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )

```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
my_div       num [1:3] 3.48 3.18 2.15
my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt      num [1:3] 0.316 2.828 1.463
newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir      "C:/Users/rpgen/OneDrive/Documents"
x            9
y            9
z            num [1:3] 1.1 9 3.14
```

```
 $ S5     : int  71 72 72 71 72 72 72 72 72 71 ...
 $ S6     : int  71 71 71 71 71 71 71 71 71 71 ...
 $ S7     : int  77 77 77 77 77 77 77 77 77 77 ...
 $ newDate: Date, format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" ...
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature")
> plot(evl2006$newDate, evl2006$S4, xlab = "Month", ylab = "Temperature", ylim=c(65, 90))
> install.packages("ggplot2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/ggplot2_3.3.5.zip'
Content type 'application/zip' length 4129114 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
> 
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
> 
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> 
```

Results after showing all the smooth curves of all rooms at noon at the same time:

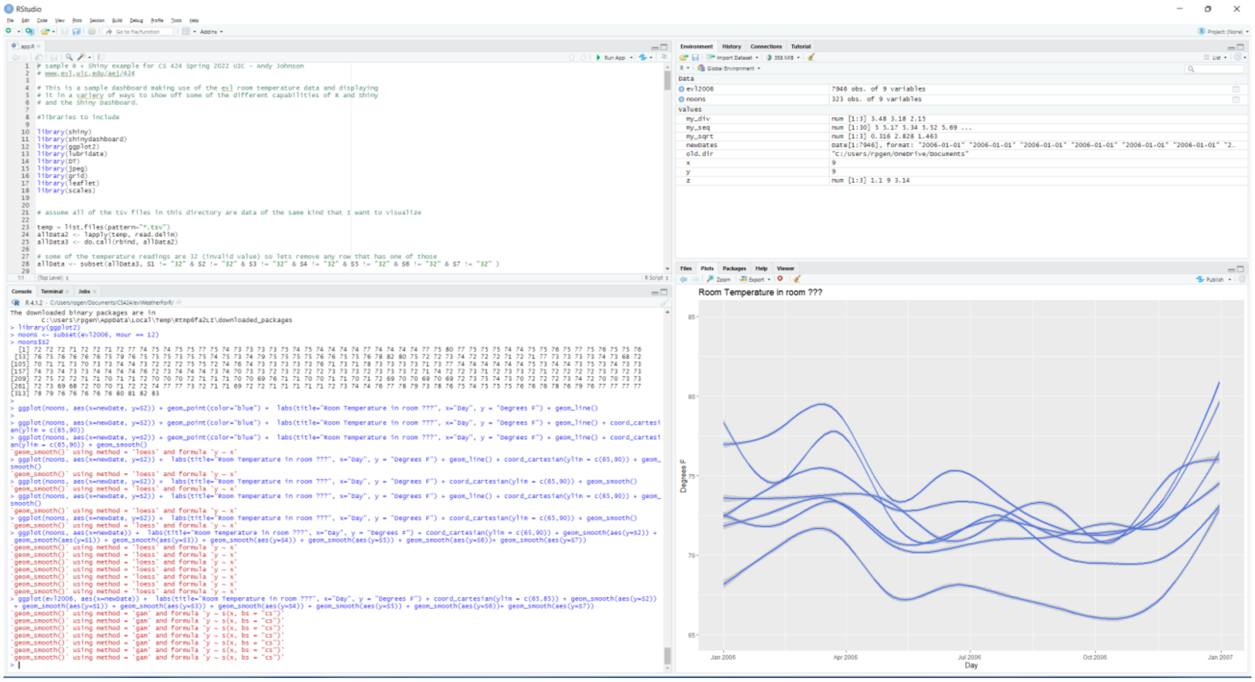


```r
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
  my_div     num [1:3] 3.48 3.18 2.15
  my_seq     num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt    num [1:3] 0.316 2.828 1.463
  newDates   Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir    "C:/Users/rpgen/OneDrive/Documents"
  x          9
  y          9
  z          num [1:3] 1.1 9 3.14
```

```
https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/ggplot2_3.3.5.zip'
Content type 'application/zip' length 4129114 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
>
```

Results after showing all smooth lines of all rooms at all hours at the same time:



```r
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

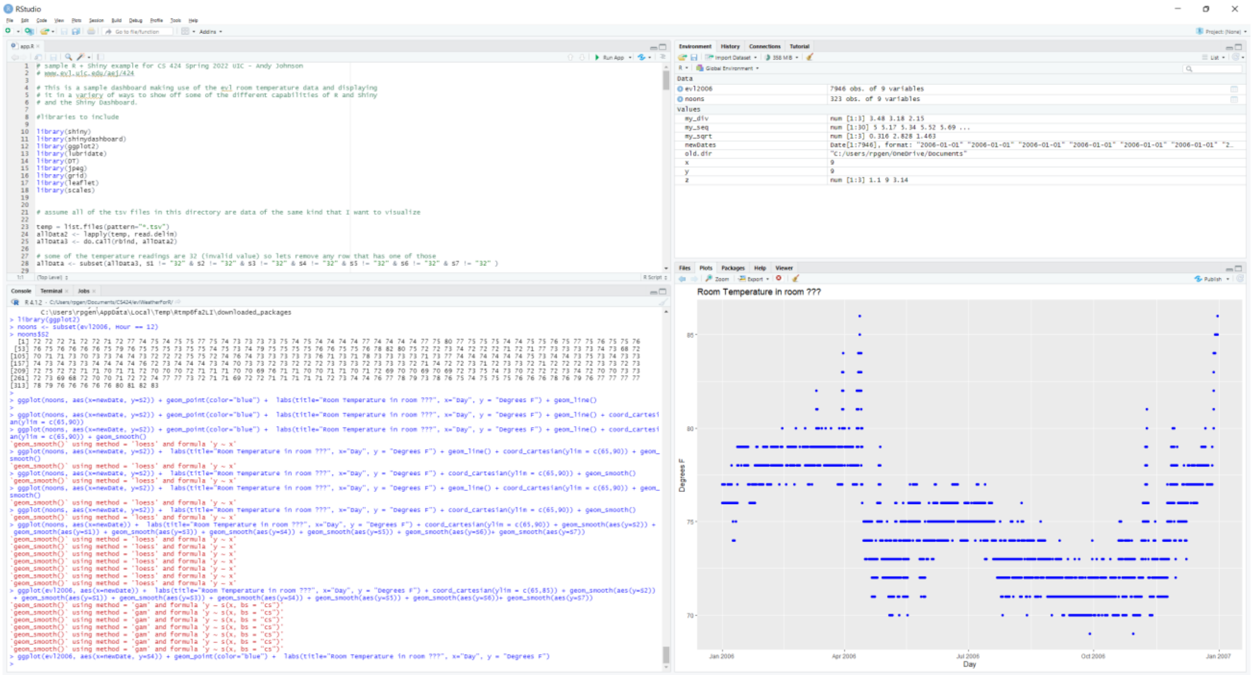
temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
  my_div     num [1:3] 3.48 3.18 2.15
  my_seq     num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt    num [1:3] 0.316 2.828 1.463
  newDates   Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir    "C:/Users/rpgen/OneDrive/Documents"
  x          9
  y          9
  z          num [1:3] 1.1 9 3.14
```

```
The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(evl2006, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,85)) + geom_smooth(aes(y=S2))
 + geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
> |
```

Results after changing the style of the points to blue:



```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

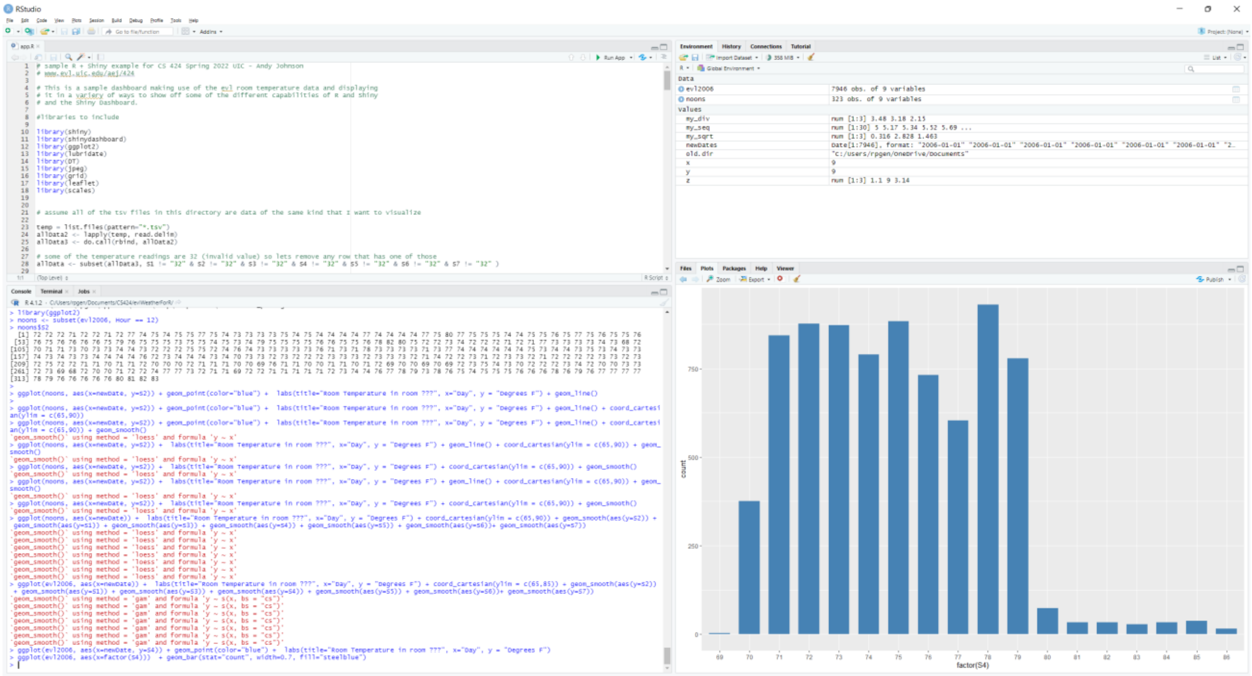
temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
Data
ev12006       7946 obs. of 9 variables
noons         323 obs. of 9 variables
Values
my_div        num [1:3] 3.48 3.18 2.15
my_seq        num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt       num [1:3] 0.316 2.828 1.463
newDates      Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir       "C:/Users/rpgen/OneDrive/Documents"
x             9
y             9
z             num [1:3] 1.1 9 3.14
```

```
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evlWeatherForR/
       C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> library(ggplot2)
> noons <- subset(ev12006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(ev12006, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,85)) + geom_smooth(aes(y=S2))
 + geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
> ggplot(ev12006, aes(x=newDate, y=S4)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F")
>
```

Results after creating a bar chart for all temps for a given room



```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

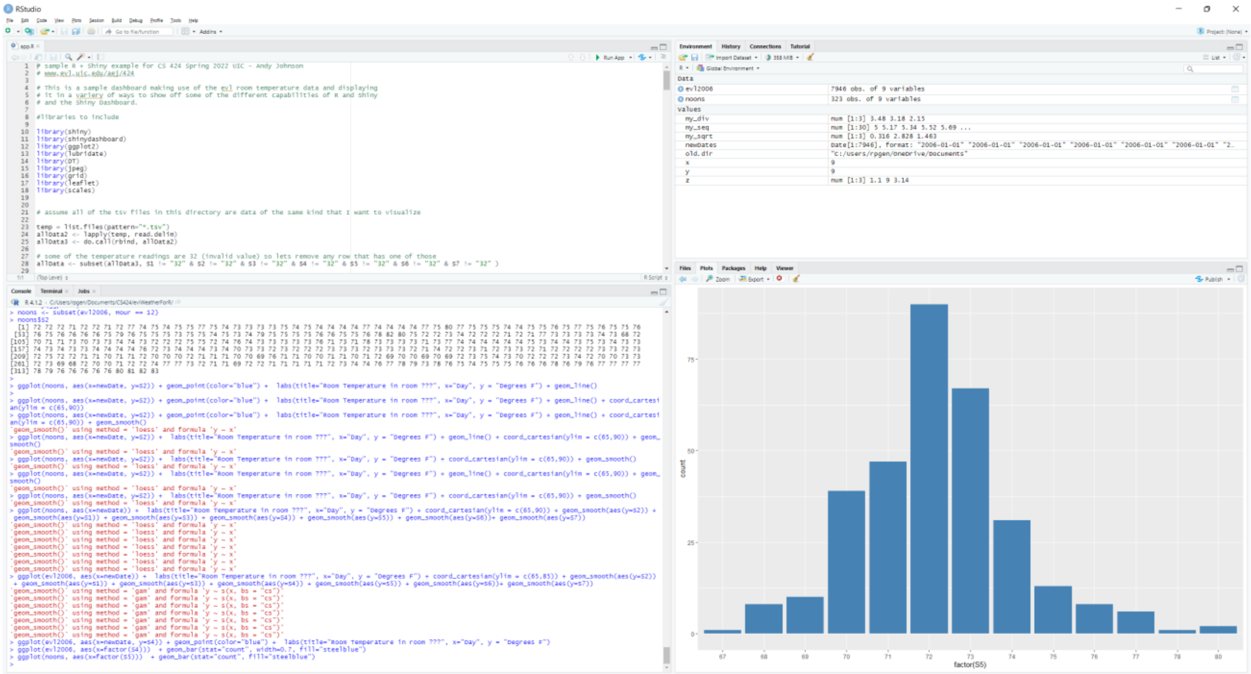
temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
Data
ev12006       7946 obs. of 9 variables
noons         323 obs. of 9 variables
Values
my_div        num [1:3] 3.48 3.18 2.15
my_seq        num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt       num [1:3] 0.316 2.828 1.463
newDates      Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir       "C:/Users/rpgen/OneDrive/Documents"
x             9
y             9
z             num [1:3] 1.1 9 3.14
```

```
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evlWeatherForR/
> library(ggplot2)
> noons <- subset(ev12006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Roon Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(ev12006, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,85)) + geom_smooth(aes(y=S2))
 + geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
> ggplot(ev12006, aes(x=newDate, y=S4)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F")
> ggplot(ev12006, aes(x=factor(S4)))  + geom_bar(stat="count", width=0.7, fill="steelblue")
> 
```

Results after changing the bar chart to only focus on noon:



```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

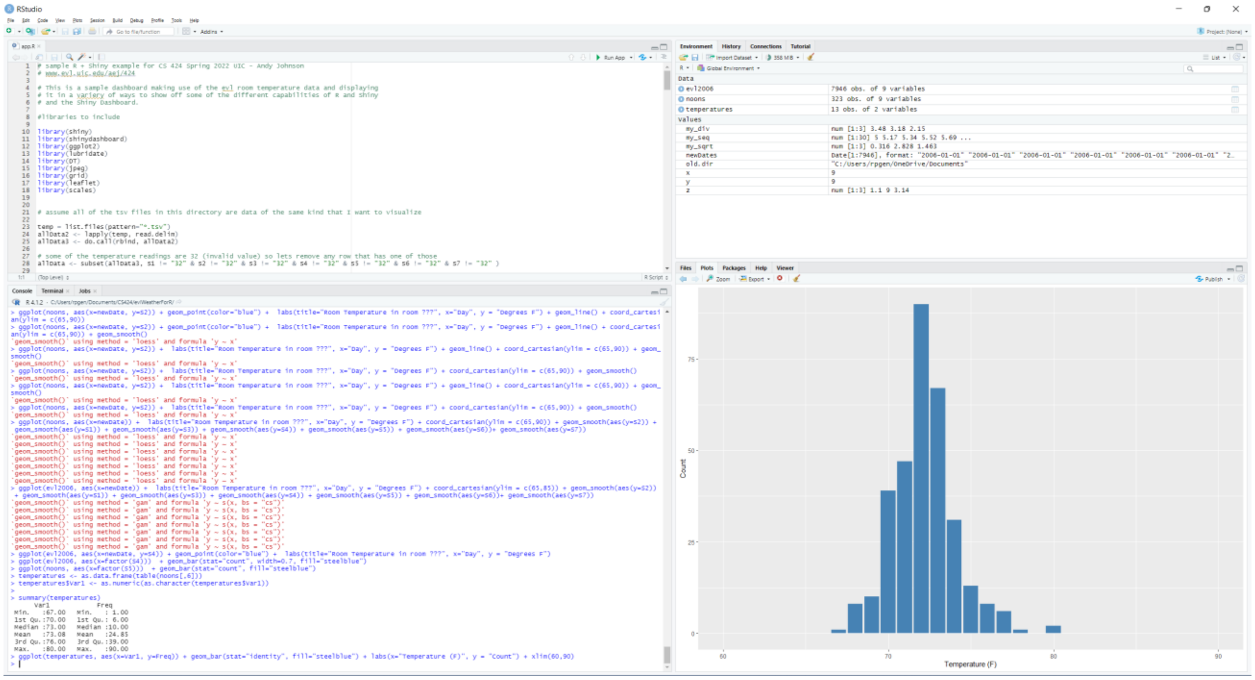
temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
Data
evl2006      7946 obs. of 9 variables
noons        323 obs. of 9 variables
Values
my_div       num [1:3] 3.48 3.18 2.15
my_seq       num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt      num [1:3] 0.316 2.828 1.463
newDates     Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir      "C:/Users/rpgen/OneDrive/Documents"
x            9
y            9
z            num [1:3] 1.1 9 3.14
```

```
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evlWeatherForR/
> noons <- subset(evl2006, Hour == 12)
> noons$S2
  [1] 72 72 72 71 72 72 71 72 77 74 75 74 75 75 77 75 74 73 73 73 73 75 74 75 74 74 74 74 77 74 74 74 74 77 75 80 77 75 75 75 74 74 75 75 76 75 77 75 76 75 75 76
 [53] 76 75 76 76 76 76 75 79 76 75 75 75 73 75 75 74 75 73 74 79 75 75 75 75 76 76 75 75 76 78 82 80 75 72 72 73 74 72 72 72 71 72 71 77 73 73 73 73 74 73 68 72
[105] 70 71 71 73 70 73 73 74 74 73 72 72 72 75 75 72 74 76 74 73 73 73 73 73 76 71 73 71 78 73 73 73 73 71 73 77 74 74 74 74 74 74 75 73 74 74 73 75 73 74 73 73
[157] 74 73 74 73 73 74 74 74 74 76 72 73 74 74 74 73 74 70 73 73 72 73 72 72 72 73 73 73 72 73 73 73 72 71 74 72 72 73 71 72 73 73 72 71 72 72 72 72 73 73 72 73
[209] 72 75 72 72 71 71 70 71 71 72 70 70 70 72 71 71 71 70 70 69 76 71 71 70 70 71 71 70 71 72 69 70 70 69 70 69 72 73 75 74 73 70 72 72 72 73 74 72 70 70 73 73
[261] 72 73 69 68 72 70 70 71 72 72 74 77 77 73 72 71 71 69 72 72 71 71 71 71 71 72 73 74 74 76 77 78 79 73 78 76 75 74 75 75 75 76 76 76 78 76 79 76 77 77 77 77
[313] 78 79 76 76 76 76 76 80 81 82 83
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line()
>
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(evl2006, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,85)) + geom_smooth(aes(y=S2))
 + geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
> ggplot(evl2006, aes(x=newDate, y=S4)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F")
> ggplot(evl2006, aes(x=factor(S4)))  + geom_bar(stat="count", width=0.7, fill="steelblue")
> ggplot(noons, aes(x=factor(S5)))  + geom_bar(stat="count", fill="steelblue")
>
```

Results after changing the bar chart to focus on the temperature as numbers and gain control over the x-axis



```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

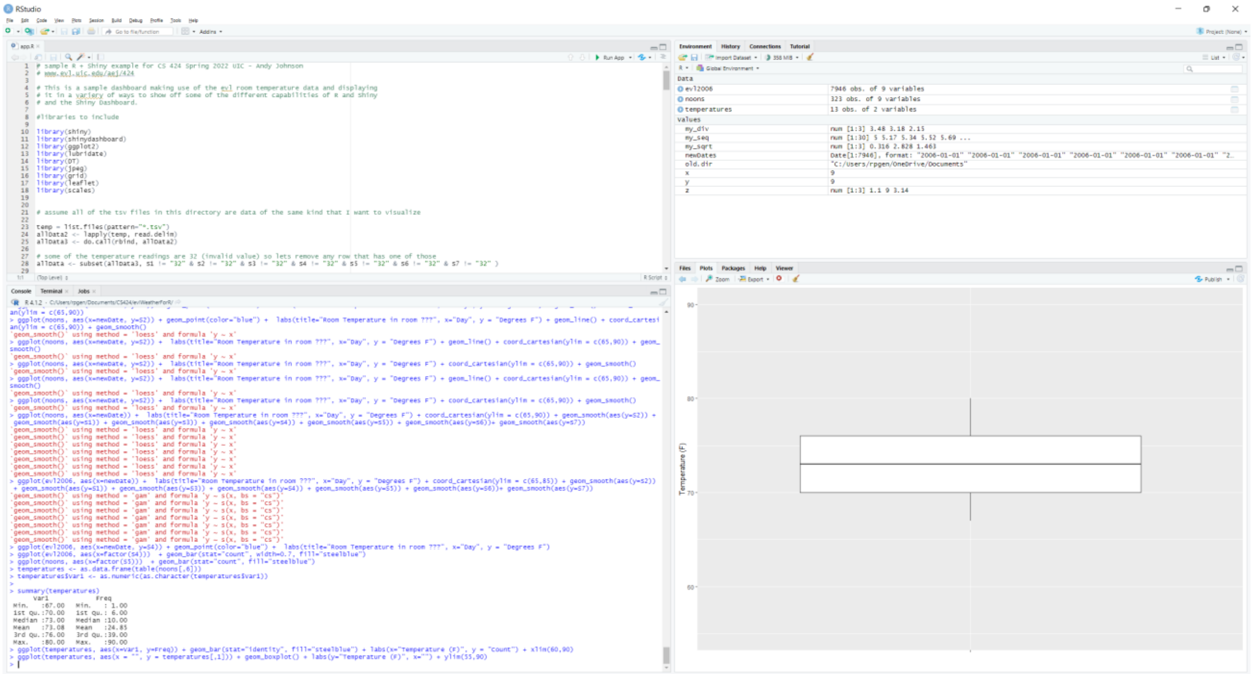
temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )
```

```
Data
evl2006        7946 obs. of 9 variables
noons          323 obs. of 9 variables
temperatures   13 obs. of 2 variables
Values
my_div         num [1:3] 3.48 3.18 2.15
my_seq         num [1:30] 5 5.17 5.34 5.52 5.69 ...
my_sqrt        num [1:3] 0.316 2.828 1.463
newDates       Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
old.dir        "C:/Users/rpgen/OneDrive/Documents"
x              9
y              9
z              num [1:3] 1.1 9 3.14
```

```
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evlWeatherForR/
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(evl2006, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,85)) + geom_smooth(aes(y=S2))
 + geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
> ggplot(evl2006, aes(x=newDate, y=S4)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F")
> ggplot(evl2006, aes(x=factor(S4)))  + geom_bar(stat="count", width=0.7, fill="steelblue")
> ggplot(noons, aes(x=factor(S5)))  + geom_bar(stat="count", fill="steelblue")
> temperatures <- as.data.frame(table(noons[,6]))
> temperatures$Var1 <- as.numeric(as.character(temperatures$Var1))
>
> summary(temperatures)
      Var1            Freq
 Min.   :67.00   Min.   : 1.00
 1st Qu.:70.00   1st Qu.: 6.00
 Median :73.00   Median :10.00
 Mean   :73.08   Mean   :24.85
 3rd Qu.:76.00   3rd Qu.:39.00
 Max.   :80.00   Max.   :90.00
> ggplot(temperatures, aes(x=Var1, y=Freq)) + geom_bar(stat="identity", fill="steelblue") + labs(x="Temperature (F)", y = "Count") + xlim(60,90)
> |
```

Results after changing the bar chart to a box and whisker plot:


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
app.R
Run App
(Top Level)
R Script
Console Terminal Jobs
R 4.1.2 · C:/Users/rpgen/Documents/CS424/evl/WeatherForR/
Environment History Connections Tutorial
Import Dataset
358 MiB
List
Global Environment
Files Plots Packages Help Viewer
Zoom Export
Publish
90
80
70
60
Temperature (F)

```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

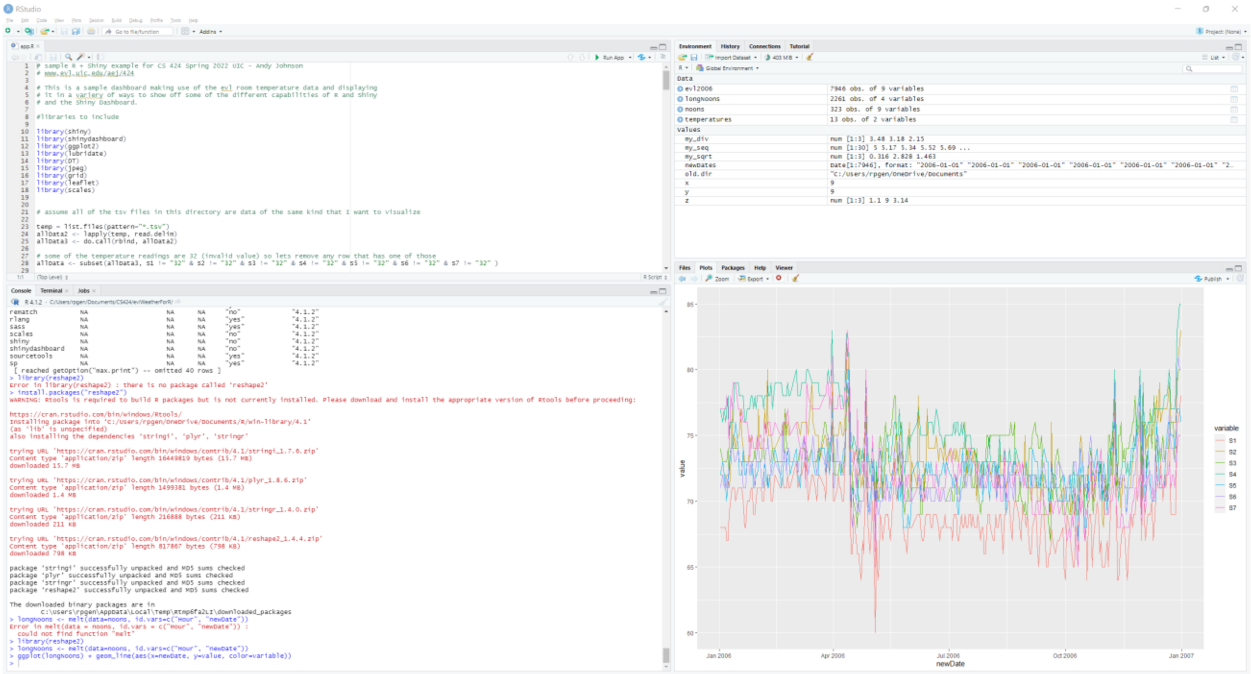
# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, s1 != "32" & s2 != "32" & s3 != "32" & s4 != "32" & s5 != "32" & s6 != "32" & s7 != "32" )

```

```
an(ylim = c(65,90))
> ggplot(noons, aes(x=newDate, y=S2)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesi
an(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + geom_line() + coord_cartesian(ylim = c(65,90)) + geom_
smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate, y=S2)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth()
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(noons, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,90)) + geom_smooth(aes(y=S2)) +
 geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
`geom_smooth()` using method = 'loess' and formula 'y ~ x'
> ggplot(evl2006, aes(x=newDate)) +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F") + coord_cartesian(ylim = c(65,85)) + geom_smooth(aes(y=S2))
 + geom_smooth(aes(y=S1)) + geom_smooth(aes(y=S3)) + geom_smooth(aes(y=S4)) + geom_smooth(aes(y=S5)) + geom_smooth(aes(y=S6))+ geom_smooth(aes(y=S7))
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
`geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
> ggplot(evl2006, aes(x=newDate, y=S4)) + geom_point(color="blue") +  labs(title="Room Temperature in room ???", x="Day", y = "Degrees F")
> ggplot(evl2006, aes(x=factor(S4)))  + geom_bar(stat="count", width=0.7, fill="steelblue")
> ggplot(noons, aes(x=factor(S5)))  + geom_bar(stat="count", fill="steelblue")
> temperatures <- as.data.frame(table(noons[,6]))
> temperatures$Var1 <- as.numeric(as.character(temperatures$Var1))
>
> summary(temperatures)
      Var1            Freq
 Min.   :67.00   Min.   : 1.00
 1st Qu.:70.00   1st Qu.: 6.00
 Median :73.00   Median :10.00
 Mean   :73.08   Mean   :24.85
 3rd Qu.:76.00   3rd Qu.:39.00
 Max.   :80.00   Max.   :90.00
> ggplot(temperatures, aes(x=Var1, y=Freq)) + geom_bar(stat="identity", fill="steelblue") + labs(x="Temperature (F)", y = "Count") + xlim(60,90)
> ggplot(temperatures, aes(x = "", y = temperatures[,1])) + geom_boxplot() + labs(y="Temperature (F)", x="") + ylim(55,90)
> 
```

```
Data
evl2006                 7946 obs. of 9 variables
noons                   323 obs. of 9 variables
temperatures            13 obs. of 2 variables
Values
  my_div                num [1:3] 3.48 3.18 2.15
  my_seq                num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt               num [1:3] 0.316 2.828 1.463
  newDates              Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir               "C:/Users/rpgen/OneDrive/Documents"
  x                     9
  y                     9
  z                     num [1:3] 1.1 9 3.14
```

Results after installing reshape2 and using its library and each color distinguishes between the rooms:



```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, s1 != "32" & s2 != "32" & s3 != "32" & s4 != "32" & s5 != "32" & s6 != "32" & s7 != "32" )

```

```
rematch           NA                   NA      NA      "no"            "4.1.2"
rlang             NA                   NA      NA      "yes"           "4.1.2"
sass              NA                   NA      NA      "yes"           "4.1.2"
scales            NA                   NA      NA      "no"            "4.1.2"
shiny             NA                   NA      NA      "no"            "4.1.2"
shinydashboard    NA                   NA      NA      "no"            "4.1.2"
sourcetools       NA                   NA      NA      "yes"           "4.1.2"
sp                NA                   NA      NA      "yes"           "4.1.2"
 [ reached getOption("max.print") -- omitted 40 rows ]
> library(reshape2)
Error in library(reshape2) : there is no package called 'reshape2'
> install.packages("reshape2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
also installing the dependencies 'stringi', 'plyr', 'stringr'

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/stringi_1.7.6.zip'
Content type 'application/zip' length 16449819 bytes (15.7 MB)
downloaded 15.7 MB

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/plyr_1.8.6.zip'
Content type 'application/zip' length 1499381 bytes (1.4 MB)
downloaded 1.4 MB

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/stringr_1.4.0.zip'
Content type 'application/zip' length 216888 bytes (211 KB)
downloaded 211 KB

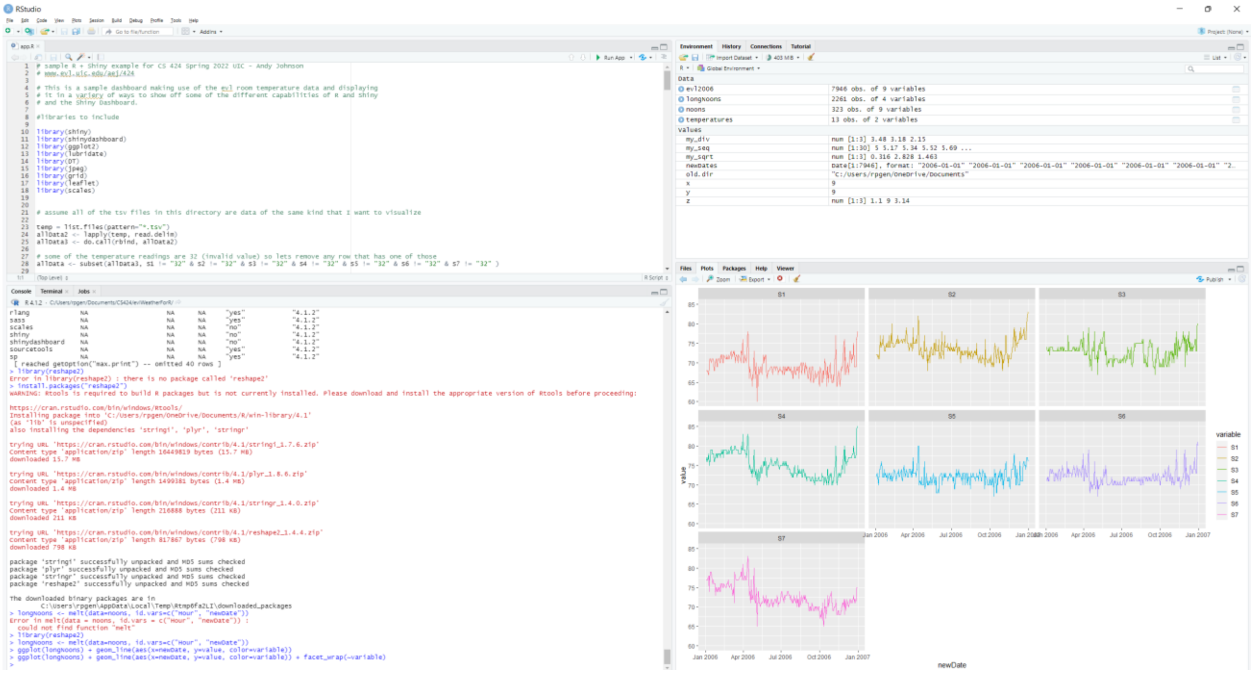
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/reshape2_1.4.4.zip'
Content type 'application/zip' length 817867 bytes (798 KB)
downloaded 798 KB

package 'stringi' successfully unpacked and MD5 sums checked
package 'plyr' successfully unpacked and MD5 sums checked
package 'stringr' successfully unpacked and MD5 sums checked
package 'reshape2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> longNoons <- melt(data=noons, id.vars=c("Hour", "newDate"))
Error in melt(data = noons, id.vars = c("Hour", "newDate")) : 
  could not find function "melt"
> library(reshape2)
> longNoons <- melt(data=noons, id.vars=c("Hour", "newDate"))
> ggplot(longNoons) + geom_line(aes(x=newDate, y=value, color=variable))
> 
```

```
Data
evl2006                 7946 obs. of 9 variables
longNoons               2261 obs. of 4 variables
noons                   323 obs. of 9 variables
temperatures            13 obs. of 2 variables
Values
  my_div                num [1:3] 3.48 3.18 2.15
  my_seq                num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt               num [1:3] 0.316 2.828 1.463
  newDates              Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir               "C:/Users/rpgen/OneDrive/Documents"
  x                     9
  y                     9
  z                     num [1:3] 1.1 9 3.14
```

Results after splitting up the graph into 7 parts representing each of the 7 rooms that had data:



```
# sample R + Shiny example for CS 424 Spring 2022 UIC - Andy Johnson
# www.evl.uic.edu/aej/424

# This is a sample dashboard making use of the evl room temperature data and displaying
# it in a variery of ways to show off some of the different capabilities of R and Shiny
# and the Shiny Dashboard.

#libraries to include

library(shiny)
library(shinydashboard)
library(ggplot2)
library(lubridate)
library(DT)
library(jpeg)
library(grid)
library(leaflet)
library(scales)


# assume all of the tsv files in this directory are data of the same kind that I want to visualize

temp = list.files(pattern="*.tsv")
allData2 <- lapply(temp, read.delim)
allData3 <- do.call(rbind, allData2)

# some of the temperature readings are 32 (invalid value) so lets remove any row that has one of those
allData <- subset(allData3, S1 != "32" & S2 != "32" & S3 != "32" & S4 != "32" & S5 != "32" & S6 != "32" & S7 != "32" )

```

```
rlang            NA                    NA      NA      "yes"           "4.1.2"
sass             NA                    NA      NA      "yes"           "4.1.2"
scales           NA                    NA      NA      "no"            "4.1.2"
shiny            NA                    NA      NA      "no"            "4.1.2"
shinydashboard   NA                    NA      NA      "no"            "4.1.2"
sourcetools      NA                    NA      NA      "yes"           "4.1.2"
sp               NA                    NA      NA      "yes"           "4.1.2"
 [ reached getOption("max.print") -- omitted 40 rows ]
> library(reshape2)
Error in library(reshape2) : there is no package called 'reshape2'
> install.packages("reshape2")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/rpgen/OneDrive/Documents/R/win-library/4.1'
(as 'lib' is unspecified)
also installing the dependencies 'stringi', 'plyr', 'stringr'

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/stringi_1.7.6.zip'
Content type 'application/zip' length 16449819 bytes (15.7 MB)
downloaded 15.7 MB

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/plyr_1.8.6.zip'
Content type 'application/zip' length 1499381 bytes (1.4 MB)
downloaded 1.4 MB

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/stringr_1.4.0.zip'
Content type 'application/zip' length 216888 bytes (211 KB)
downloaded 211 KB

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.1/reshape2_1.4.4.zip'
Content type 'application/zip' length 817867 bytes (798 KB)
downloaded 798 KB

package 'stringi' successfully unpacked and MD5 sums checked
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package 'stringr' successfully unpacked and MD5 sums checked
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The downloaded binary packages are in
        C:\Users\rpgen\AppData\Local\Temp\Rtmp6fa2LI\downloaded_packages
> longNoons <- melt(data=noons, id.vars=c("Hour", "newDate"))
Error in melt(data = noons, id.vars = c("Hour", "newDate")) :
  could not find function "melt"
> library(reshape2)
> longNoons <- melt(data=noons, id.vars=c("Hour", "newDate"))
> ggplot(longNoons) + geom_line(aes(x=newDate, y=value, color=variable))
> ggplot(longNoons) + geom_line(aes(x=newDate, y=value, color=variable)) + facet_wrap(~variable)
>
```

```
Data
evl2006          7946 obs. of 9 variables
longNoons        2261 obs. of 4 variables
noons            323 obs. of 9 variables
temperatures     13 obs. of 2 variables
Values
  my_div         num [1:3] 3.48 3.18 2.15
  my_seq         num [1:30] 5 5.17 5.34 5.52 5.69 ...
  my_sqrt        num [1:3] 0.316 2.828 1.463
  newDates       Date[1:7946], format: "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2006-01-01" "2…
  old.dir        "C:/Users/rpgen/OneDrive/Documents"
  x              9
  y              9
  z              num [1:3] 1.1 9 3.14
```

GitHub Link: https://rg3n0v4.github.io/

ShinyApps.io site: https://rgenov2.shinyapps.io/evlWeatherForR/

Raphael Genova CS424

In [1]:

```
utility <- read.table(file = "utilitydata2021.tsv", sep = "\t", header = TRUE)
```

In [2]:

```
complete.cases(utility)
```

```
 1. TRUE
 2. TRUE
 3. TRUE
 4. TRUE
 5. TRUE
 6. TRUE
 7. TRUE
 8. TRUE
 9. TRUE
10. TRUE
11. TRUE
12. TRUE
13. TRUE
14. TRUE
15. TRUE
16. TRUE
17. TRUE
18. TRUE
19. TRUE
20. TRUE
21. TRUE
22. TRUE
23. TRUE
24. TRUE
25. TRUE
26. TRUE
27. TRUE
28. TRUE
29. TRUE
30. TRUE
31. TRUE
32. TRUE
33. TRUE
34. TRUE
35. TRUE
36. TRUE
37. TRUE
38. TRUE
39. TRUE
40. TRUE
41. TRUE
```

42. TRUE
43. TRUE
44. TRUE
45. TRUE
46. TRUE
47. TRUE
48. TRUE
49. TRUE
50. TRUE
51. TRUE
52. TRUE
53. TRUE
54. TRUE
55. TRUE
56. TRUE
57. TRUE
58. TRUE
59. TRUE
60. TRUE
61. TRUE
62. TRUE
63. TRUE
64. TRUE
65. TRUE
66. TRUE
67. TRUE
68. TRUE
69. TRUE
70. TRUE
71. TRUE
72. TRUE
73. TRUE
74. TRUE
75. TRUE
76. TRUE
77. TRUE
78. TRUE
79. TRUE
80. TRUE
81. TRUE
82. TRUE
83. TRUE
84. TRUE
85. TRUE
86. TRUE
87. TRUE
88. TRUE
89. TRUE
90. TRUE
91. TRUE

```
 92. TRUE
 93. TRUE
 94. TRUE
 95. TRUE
 96. TRUE
 97. TRUE
 98. TRUE
 99. TRUE
100. TRUE
101. TRUE
102. TRUE
103. TRUE
104. TRUE
105. TRUE
106. TRUE
107. TRUE
108. TRUE
109. TRUE
110. TRUE
111. TRUE
112. TRUE
113. TRUE
114. TRUE
115. TRUE
116. TRUE
117. TRUE
118. TRUE
119. TRUE
120. TRUE
121. TRUE
122. TRUE
123. TRUE
124. TRUE
125. TRUE
126. TRUE
127. TRUE
128. TRUE
129. TRUE
130. TRUE
131. TRUE
132. TRUE
133. TRUE
134. TRUE
135. TRUE
136. TRUE
137. TRUE
138. TRUE
139. TRUE
140. TRUE
141. TRUE
```

```
142. TRUE
143. TRUE
144. TRUE
145. TRUE
146. TRUE
147. TRUE
148. TRUE
149. TRUE
150. TRUE
151. TRUE
152. TRUE
153. TRUE
154. TRUE
155. TRUE
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178. TRUE
179. TRUE
180. TRUE
181. TRUE
182. TRUE
183. TRUE
184. TRUE
185. TRUE
186. TRUE
187. TRUE
188. TRUE
189. TRUE
190. TRUE
191. TRUE
```

192. TRUE
193. TRUE
194. TRUE
195. TRUE
196. TRUE
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198. TRUE
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226. TRUE
227. TRUE
228. TRUE
229. TRUE
230. TRUE
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232. TRUE
233. TRUE
234. TRUE
235. TRUE
236. TRUE
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238. TRUE
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240. TRUE
241. TRUE

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242. TRUE
243. TRUE
244. TRUE
245. TRUE
246. TRUE
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248. TRUE
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258. TRUE
259. TRUE
260. TRUE
261. TRUE
262. TRUE
263. TRUE
264. TRUE
265. TRUE
266. TRUE
267. TRUE
268. TRUE
269. TRUE
270. TRUE
271. TRUE
272. TRUE
273. TRUE
274. TRUE
275. TRUE
```

In [3]:

```
library(lubridate)
```

```
Warning message:
"package 'lubridate' was built under R version 3.6.3"

Attaching package: 'lubridate'


The following objects are masked from 'package:base':

    date, intersect, setdiff, union
```

In [4]:

```
sessioninfo()
```

```
Error in sessioninfo(): could not find function "sessioninfo"
Traceback:
```

```
In [5]: sessionInfo()
```

```
R version 3.6.1 (2019-07-05)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 10 x64 (build 22000)

Matrix products: default

locale:
[1] LC_COLLATE=English_United States.1252
[2] LC_CTYPE=English_United States.1252
[3] LC_MONETARY=English_United States.1252
[4] LC_NUMERIC=C
[5] LC_TIME=English_United States.1252

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
[1] lubridate_1.7.10

loaded via a namespace (and not attached):
 [1] compiler_3.6.1   generics_0.1.1   IRdisplay_0.7.0 pbdZMQ_0.3-3
 [5] tools_3.6.1      htmltools_0.3.6 base64enc_0.1-3 crayon_1.4.2
 [9] Rcpp_1.0.1       uuid_0.1-2      IRkernel_1.3    jsonlite_1.6
[13] digest_0.6.23    repr_0.19.2     evaluate_0.14
```

```
In [6]: paste(utility$Year, utility$Month, "01", sep="-")
```

```
 1. '1999-1-01'
 2. '1999-2-01'
 3. '1999-3-01'
 4. '1999-4-01'
 5. '1999-5-01'
 6. '1999-6-01'
 7. '1999-7-01'
 8. '1999-8-01'
 9. '1999-9-01'
10. '1999-10-01'
11. '1999-11-01'
12. '1999-12-01'
13. '2000-1-01'
14. '2000-2-01'
15. '2000-3-01'
16. '2000-4-01'
17. '2000-5-01'
18. '2000-6-01'
19. '2000-7-01'
20. '2000-8-01'
21. '2000-9-01'
22. '2000-10-01'
23. '2000-11-01'
24. '2000-12-01'
25. '2001-1-01'
26. '2001-2-01'
27. '2001-3-01'
```

```
28. '2001-4-01'
29. '2001-5-01'
30. '2001-6-01'
31. '2001-7-01'
32. '2001-8-01'
33. '2001-9-01'
34. '2001-10-01'
35. '2001-11-01'
36. '2001-12-01'
37. '2002-1-01'
38. '2002-2-01'
39. '2002-3-01'
40. '2002-4-01'
41. '2002-5-01'
42. '2002-6-01'
43. '2002-7-01'
44. '2002-8-01'
45. '2002-9-01'
46. '2002-10-01'
47. '2002-11-01'
48. '2002-12-01'
49. '2003-1-01'
50. '2003-2-01'
51. '2003-3-01'
52. '2003-4-01'
53. '2003-5-01'
54. '2003-6-01'
55. '2003-7-01'
56. '2003-8-01'
57. '2003-9-01'
58. '2003-10-01'
59. '2003-11-01'
60. '2003-12-01'
61. '2004-1-01'
62. '2004-2-01'
63. '2004-3-01'
64. '2004-4-01'
65. '2004-5-01'
66. '2004-6-01'
67. '2004-7-01'
68. '2004-8-01'
69. '2004-9-01'
70. '2004-10-01'
71. '2004-11-01'
72. '2004-12-01'
73. '2005-1-01'
74. '2005-2-01'
75. '2005-3-01'
76. '2005-4-01'
77. '2005-5-01'
```

```
 78. '2005-6-01'
 79. '2005-7-01'
 80. '2005-8-01'
 81. '2005-9-01'
 82. '2005-10-01'
 83. '2005-11-01'
 84. '2005-12-01'
 85. '2006-1-01'
 86. '2006-2-01'
 87. '2006-3-01'
 88. '2006-4-01'
 89. '2006-5-01'
 90. '2006-6-01'
 91. '2006-7-01'
 92. '2006-8-01'
 93. '2006-9-01'
 94. '2006-10-01'
 95. '2006-11-01'
 96. '2006-12-01'
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128. '2009-8-01'
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178. '2013-10-01'
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253. '2020-1-01'
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255. '2020-3-01'
256. '2020-4-01'
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263. '2020-11-01'
264. '2020-12-01'
265. '2021-1-01'
266. '2021-2-01'
267. '2021-3-01'
268. '2021-4-01'
269. '2021-5-01'
270. '2021-6-01'
271. '2021-7-01'
272. '2021-8-01'
273. '2021-9-01'
274. '2021-10-01'
275. '2021-11-01'
```

In [7]:

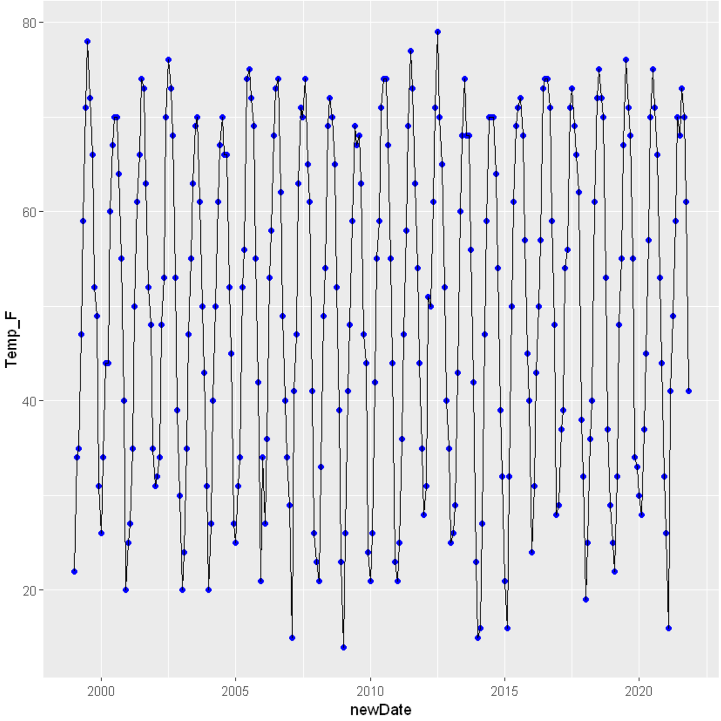
```
utility$newDate <- ymd(paste(utility$Year, utility$Month, "01", sep="-"))
```

In [8]:

```
library(ggplot2)
```

In [9]:

```
ggplot(utility, aes(x=newDate, y=Temp_F)) + geom_point(color="blue") + geom_line()
```

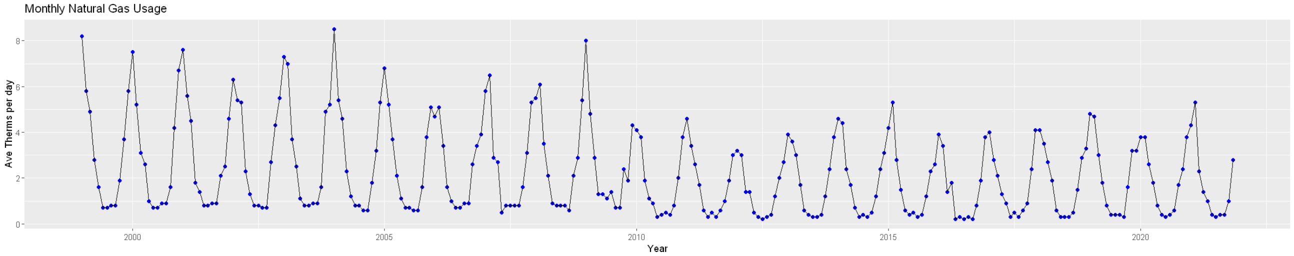


In [10]:

```
options(repr.plot.width=20, repr.plot.height=4)
```

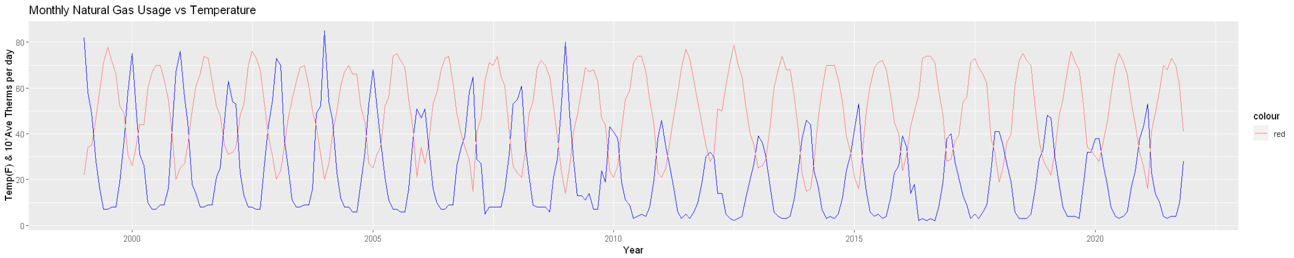
In [13]:

```
ggplot(utility, aes(x=newDate, y=Gas_Th_per_Day)) + geom_point(color="blue") + geom_line()+ labs(title
```



In [14]:

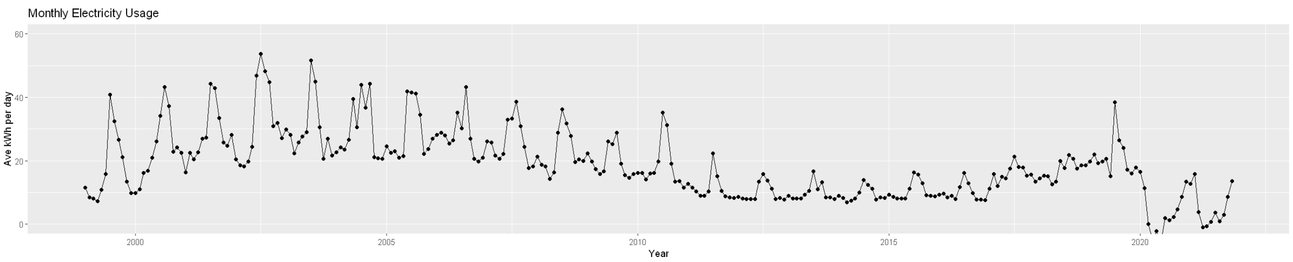
```
ggplot(utility, aes(x=newDate, y=10*Gas_Th_per_Day)) + geom_line(colour="blue") + geom_line(aes(y=Temp_
```



I noticed that during the early 2000s, the amount of natural gas used monthly have some of the highest values because that time period was dubbed as the Warmest Decade.

In [16]:

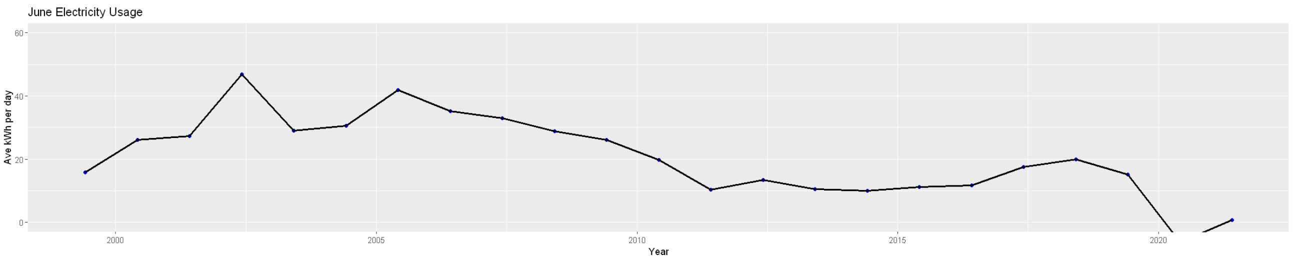
```
ggplot(utility, aes(x=newDate, y=E_kWh_per_Day)) + geom_line() + geom_point() + coord_cartesian(ylim =
```



I noticed that since the start of the pandemic, the amount of electricity used per month dramatically dropped especially since no one was in the classroom.

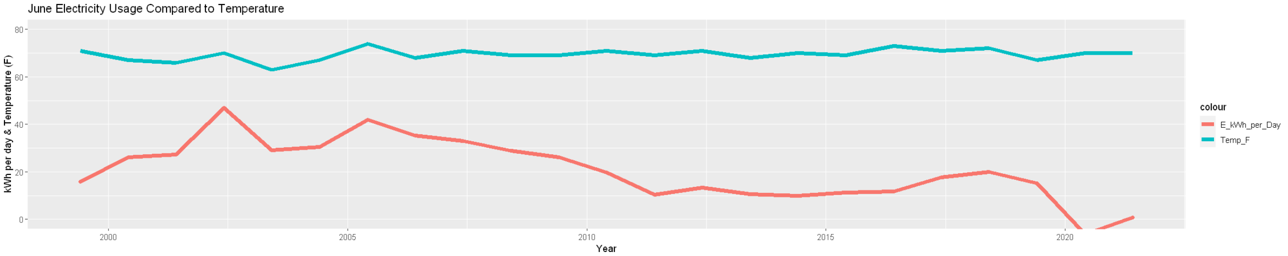
In [19]:

```
junes <- subset(utility, Month == 6)
ggplot(junes, aes(x=newDate, y=E_kWh_per_Day)) + geom_point(color="blue") + geom_line(size=1) + coord_c
```



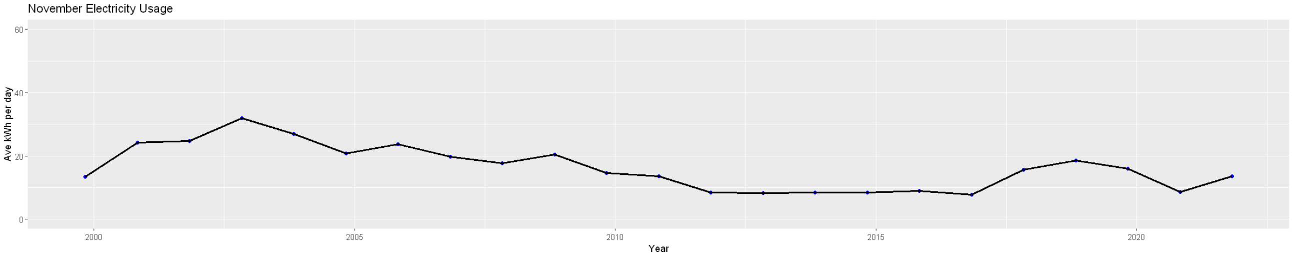
In [18]:

```
ggplot(data=junes, aes(x=newDate, y=E_kWh_per_Day, colour="E_kWh_per_Day")) + geom_point() + geom_line(
```



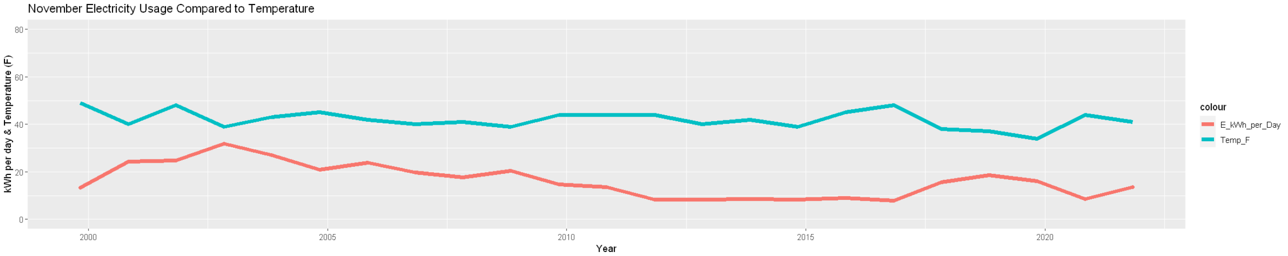
In [21]:

```
novembers <- subset(utility, Month == 11)
ggplot(novembers, aes(x=newDate, y=E_kWh_per_Day)) + geom_point(color="blue") + geom_line(size=1) + coo
```



In [22]:

```
ggplot(data=novembers, aes(x=newDate, y=E_kWh_per_Day, colour="E_kWh_per_Day")) + geom_point() + geom_l
```



What I noticed with the month of November throughout the years was that the electricity and temperature usage lines look like a reflection of each other.

In [ ]: