EDA with scatterplots

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STAT 423

Applied Regression and Analysis of Variance

University of Washington

Things to learn

Data analysis objectives

- description
- prediction
- inference

Tools for plotting

- scatterplots
- jittering
- boxplots
- dichotomization
- color and plotting characters
- transformations
- scaling
- lines

Seattle weather data

```
weather[1:5,1:8]
```

```
##         Date Max_Temperature_F Mean_Temperature_F Min_TemperatureF
## 1 10/13/2014                71                 62               54
## 2 10/14/2014                63                 59               55
## 3 10/15/2014                62                 58               54
## 4 10/16/2014                71                 61               52
## 5 10/17/2014                64                 60               57
##   Max_Dew_Point_F MeanDew_Point_F Min_Dewpoint_F Max_Humidity
## 1              55              51             46           87
## 2              52              51             50           88
## 3              53              50             46           87
## 4              49              46             42           83
## 5              55              51             41           87
```

```
dim(weather)
```

```
## [1] 365  21
```

```
colnames(weather)
```

```
##  [1] "Date"                      "Max_Temperature_F"
##  [3] "Mean_Temperature_F"        "Min_TemperatureF"
##  [5] "Max_Dew_Point_F"           "MeanDew_Point_F"
##  [7] "Min_Dewpoint_F"            "Max_Humidity"
##  [9] "Mean_Humidity"             "Min_Humidity"
## [11] "Max_Sea_Level_Pressure_In" "Mean_Sea_Level_Pressure_In"
## [13] "Min_Sea_Level_Pressure_In" "Max_Visibility_Miles"
## [15] "Mean_Visibility_Miles"     "Min_Visibility_Miles"
## [17] "Max_Wind_Speed_MPH"        "Mean_Wind_Speed_MPH"
## [19] "Max_Gust_Speed_MPH"        "Precipitation_In"
## [21] "Events"
```

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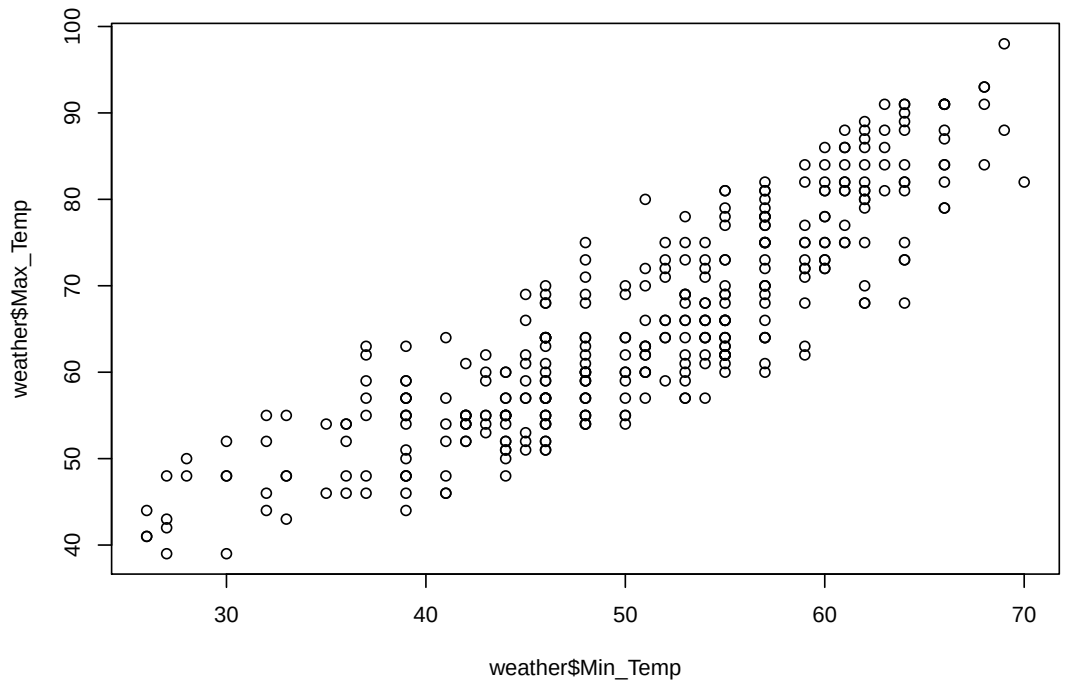

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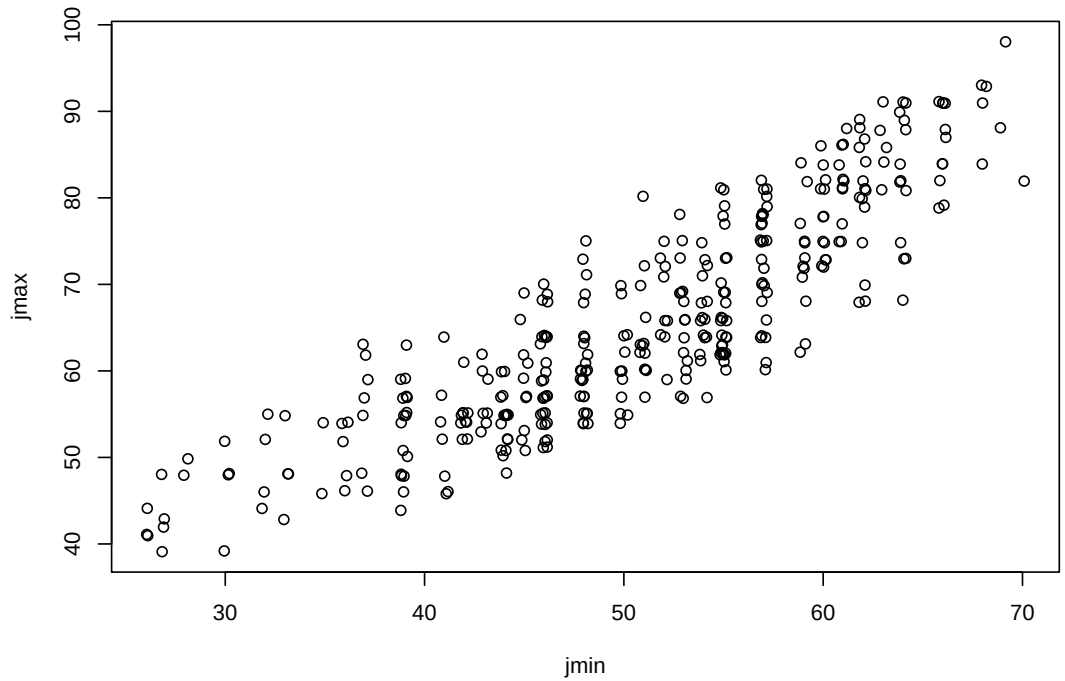

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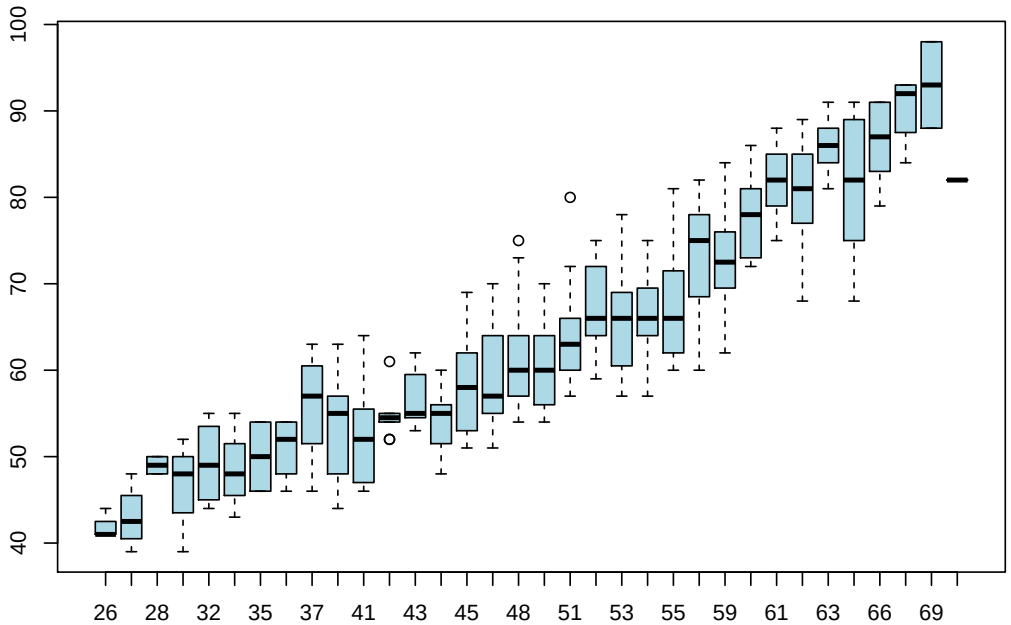

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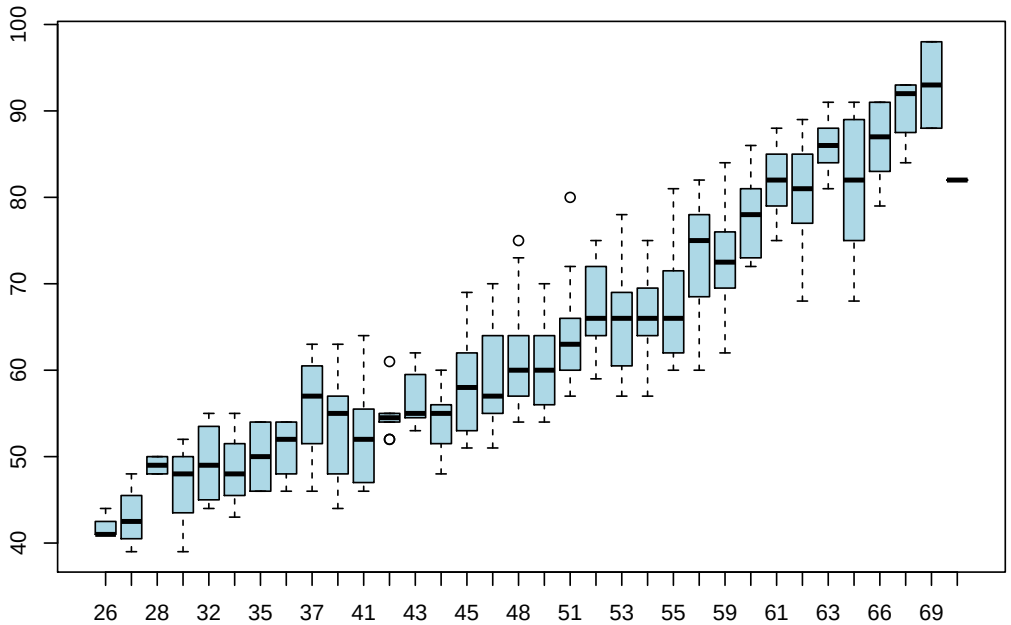

scatterplot, jittering, boxplots

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Rain and temperature

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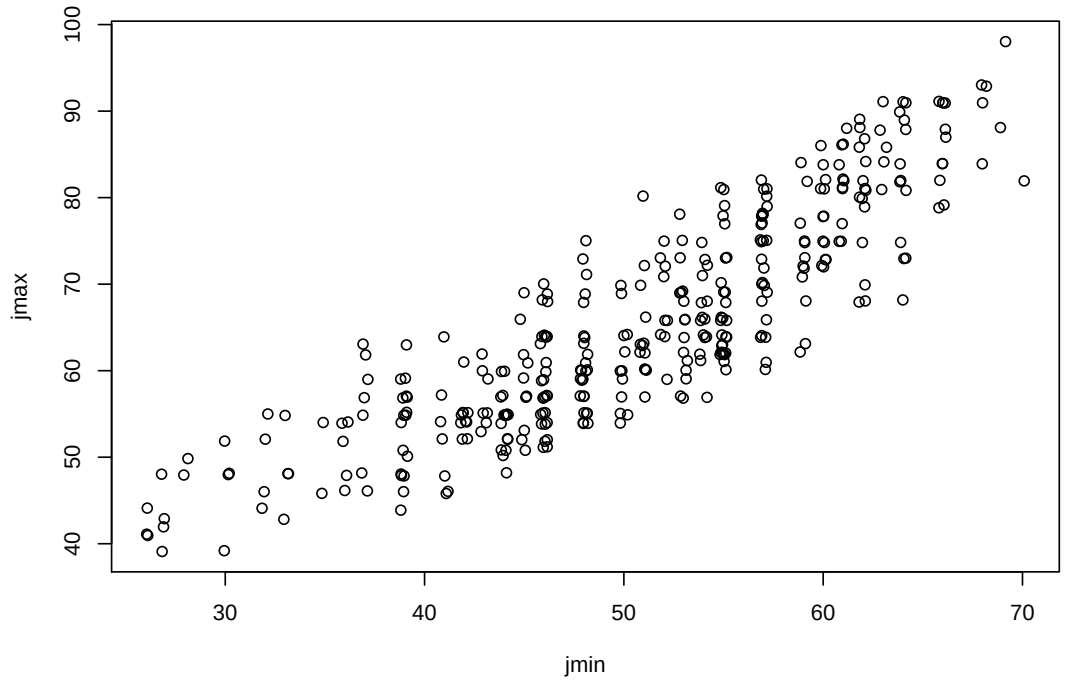

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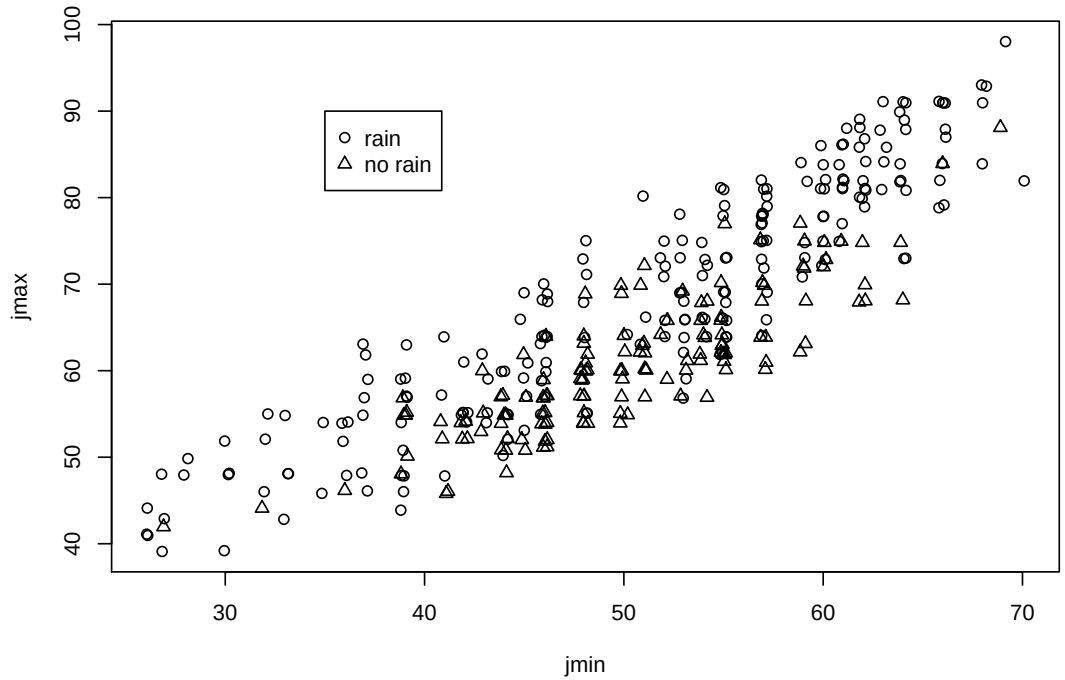

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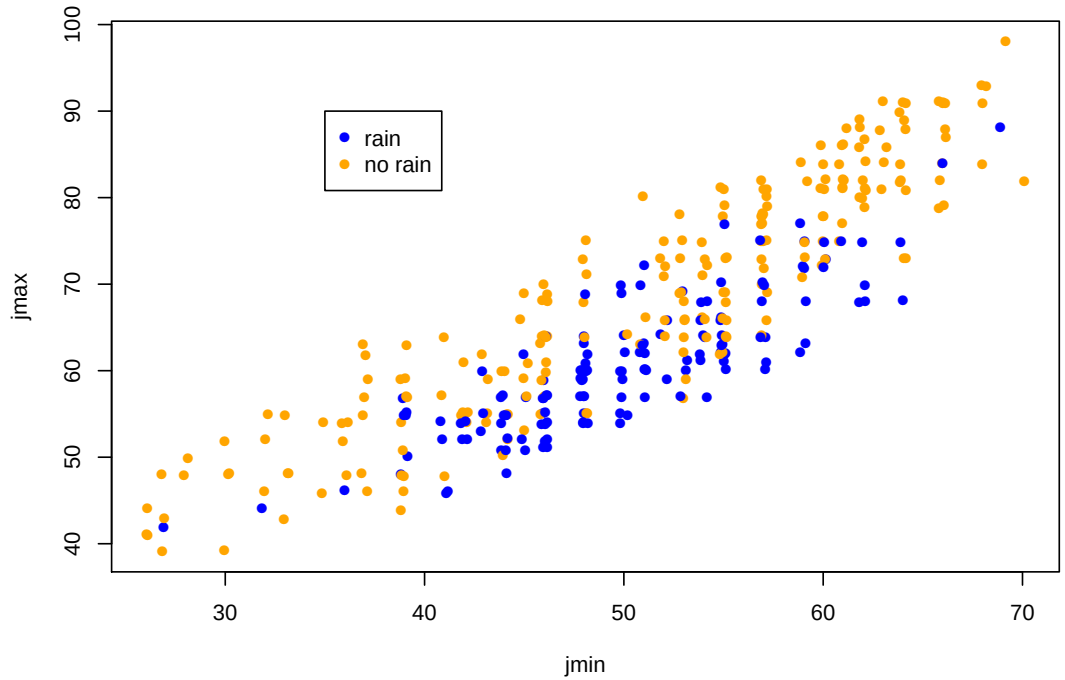

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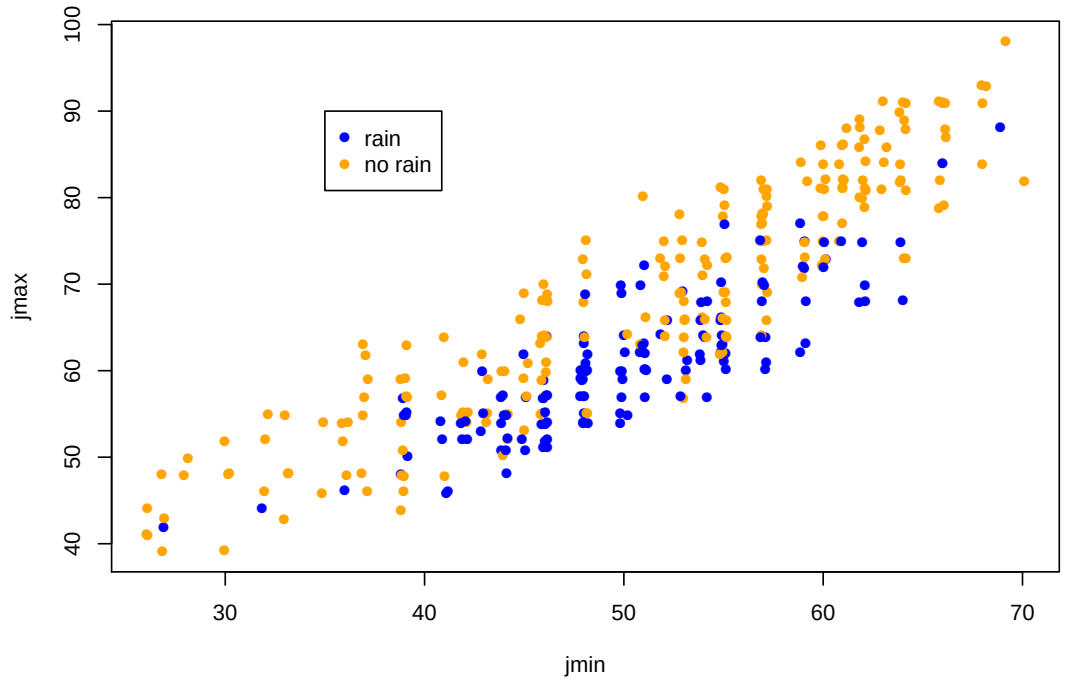

dichotomization, plotting characters, plotting colors

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Predictive:

- What are the likely values of max temp, given min temp and rain?

Inferential:

- Is there an effect of rain on the relationship between min and max temp?

Bike share data

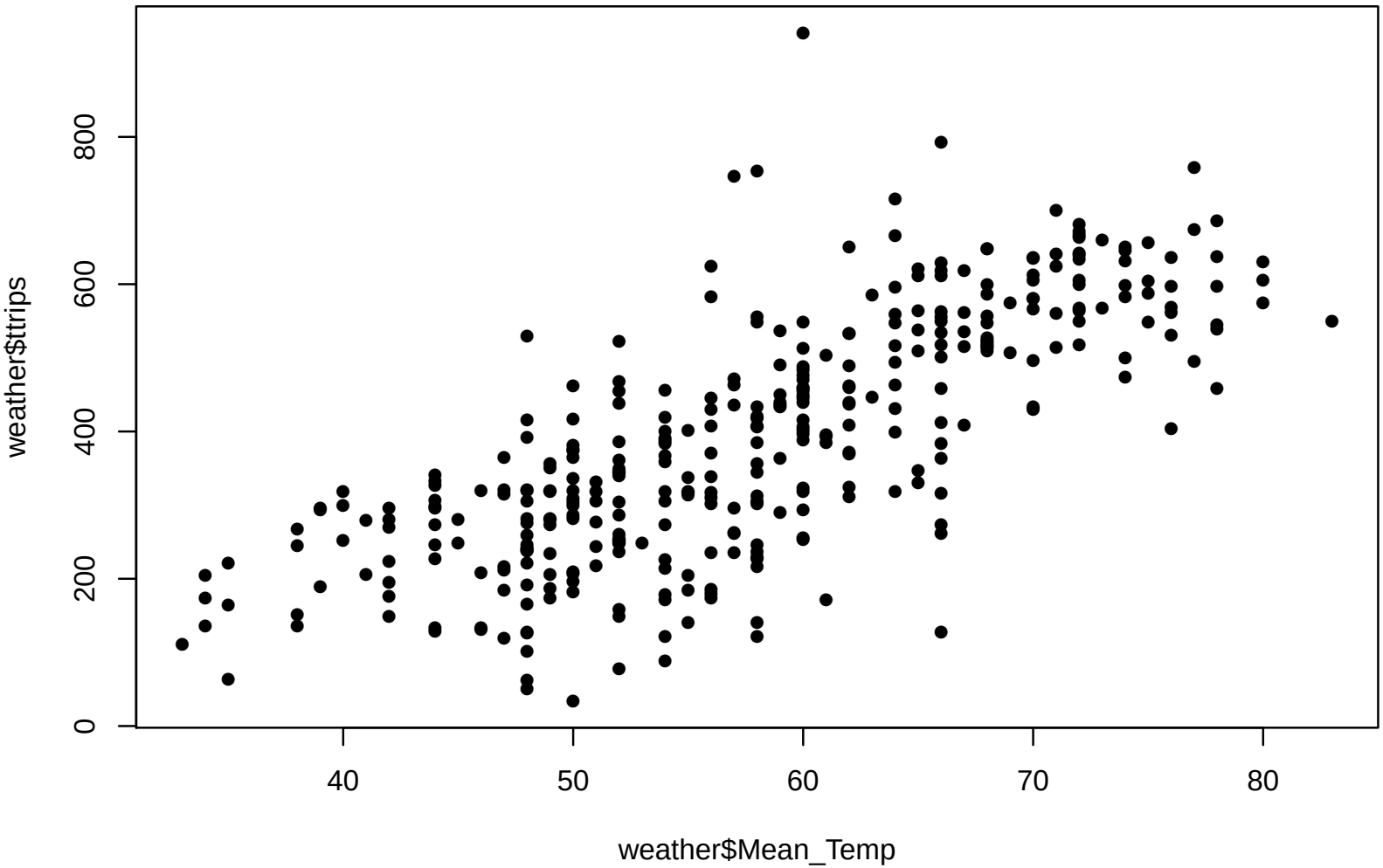
Pronto bike share data:

https://www.prontocycleshare.com/datachallenge

```
weather[1:10,c("Date","Mean_Temperature_F","Precipitation_In","ttrips")]
```

```
##          Date Mean_Temperature_F Precipitation_In ttrips
## 1  10/13/2014                 62             0.00    409
## 2  10/14/2014                 59             0.11    491
## 3  10/15/2014                 58             0.45    313
## 4  10/16/2014                 61             0.00    395
## 5  10/17/2014                 60             0.14    294
## 6  10/18/2014                 64             0.31    399
## 7  10/19/2014                 64             0.00    666
## 8  10/20/2014                 60             0.44    389
## 9  10/21/2014                 58             0.10    357
## 10 10/22/2014                 58             1.43    141
```

Bike share data



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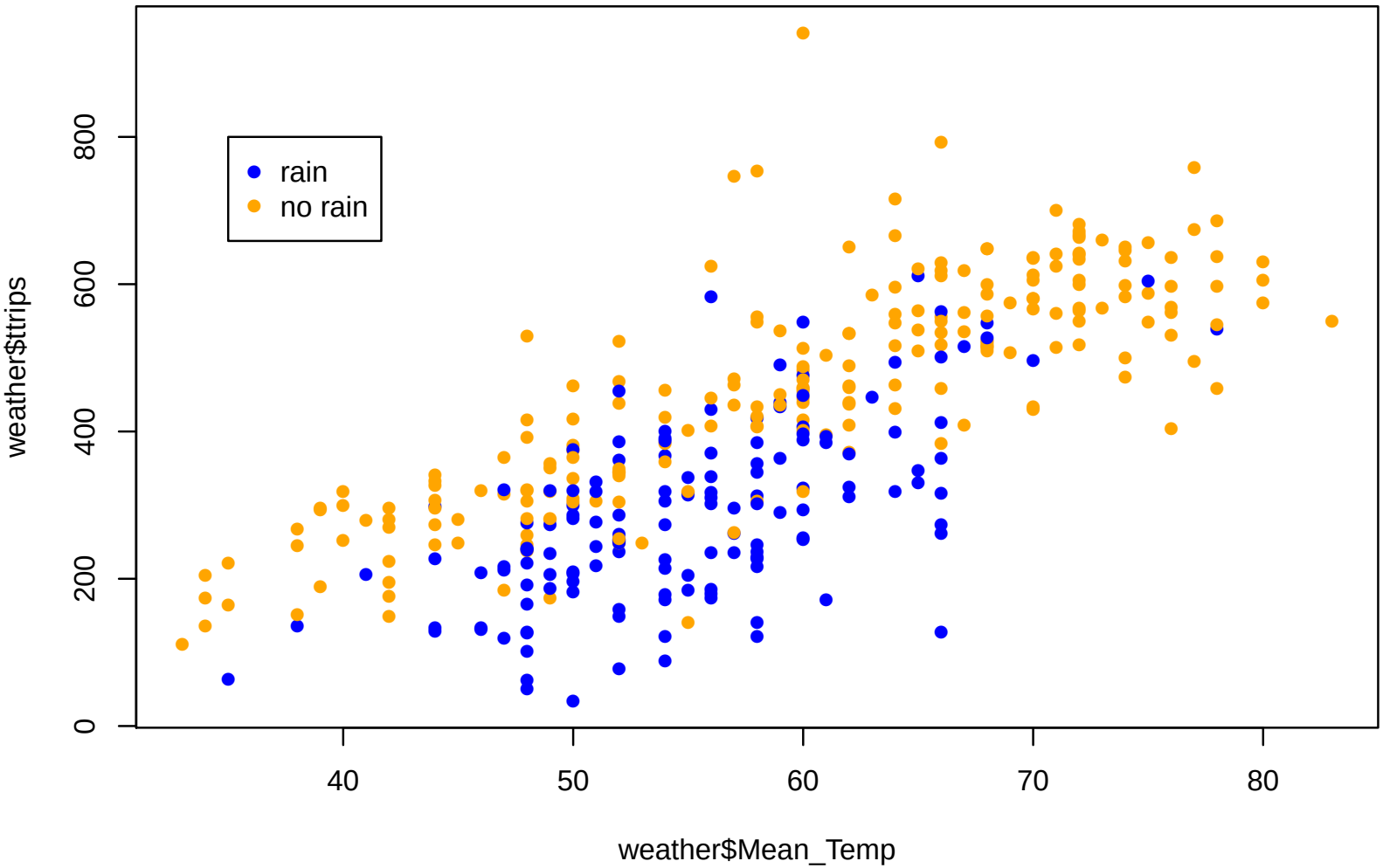

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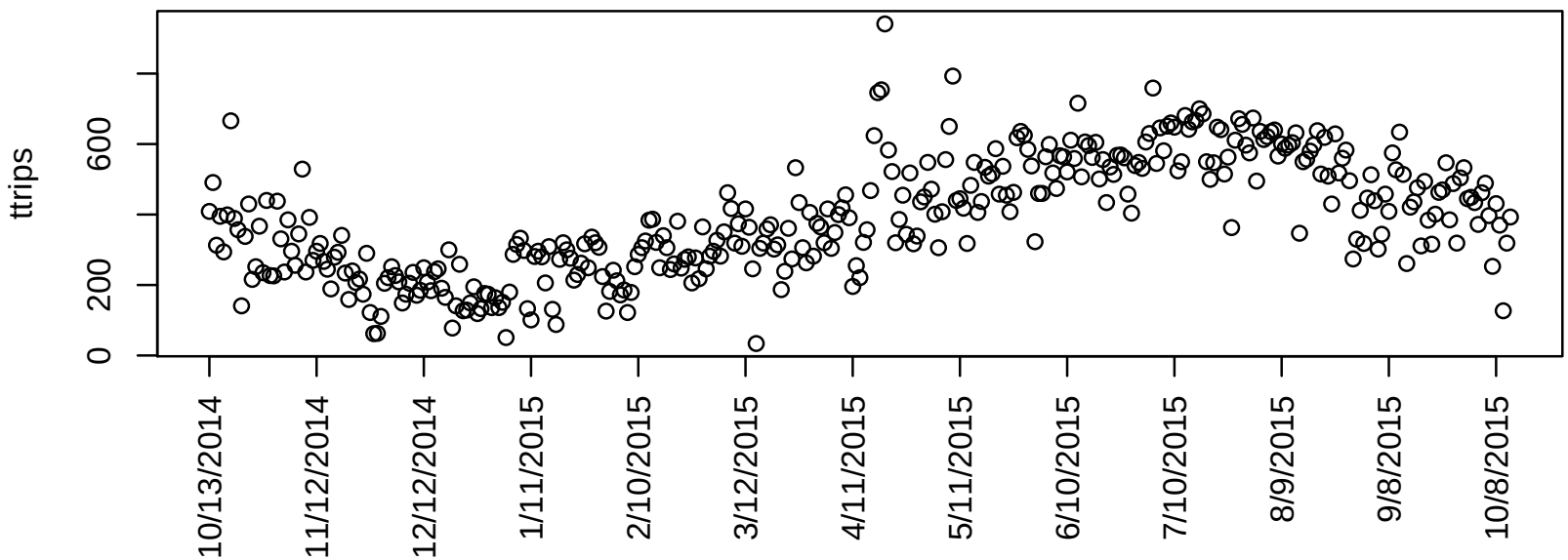

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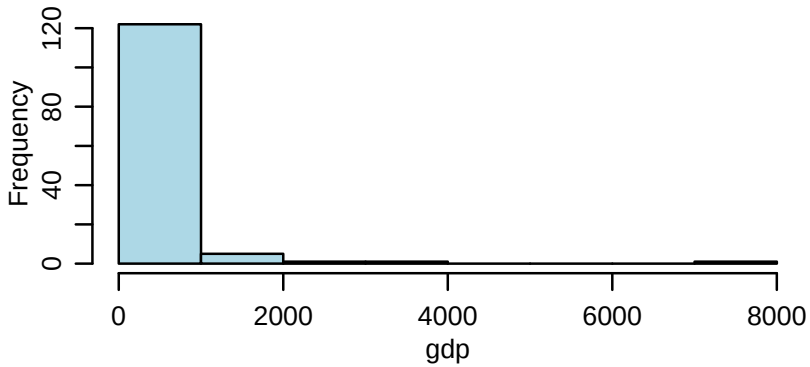
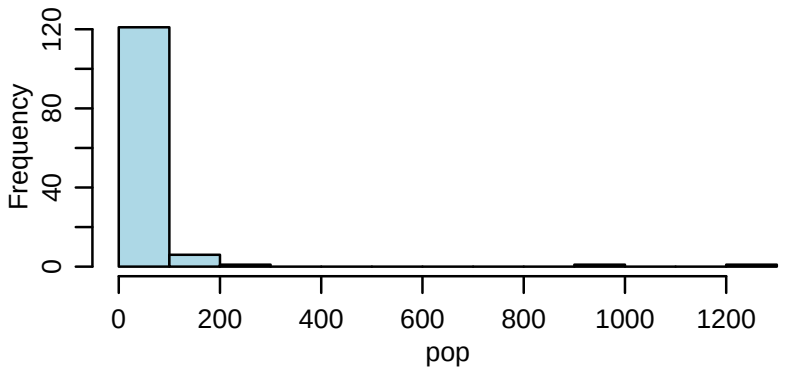
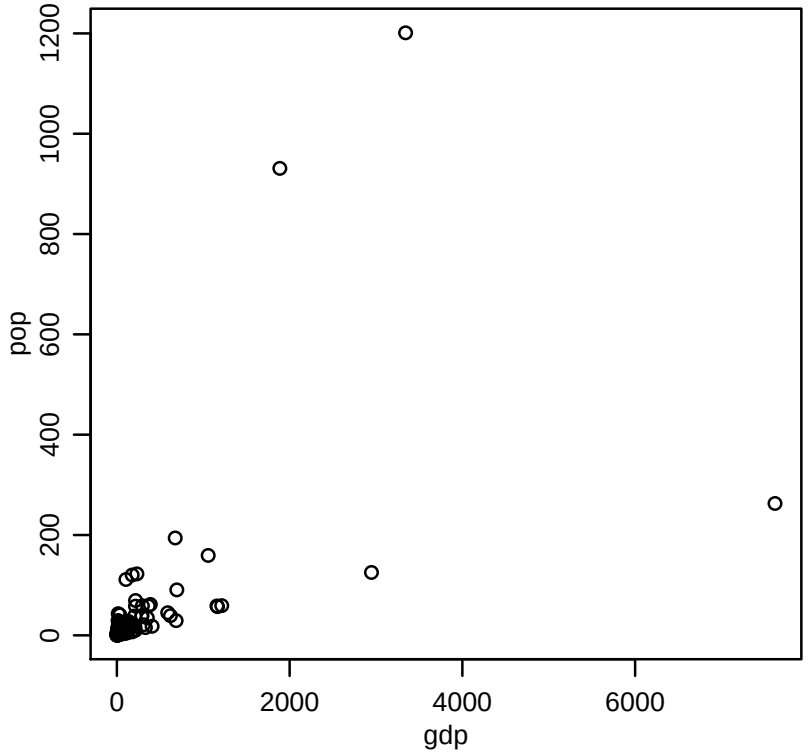
GDP, population and polity







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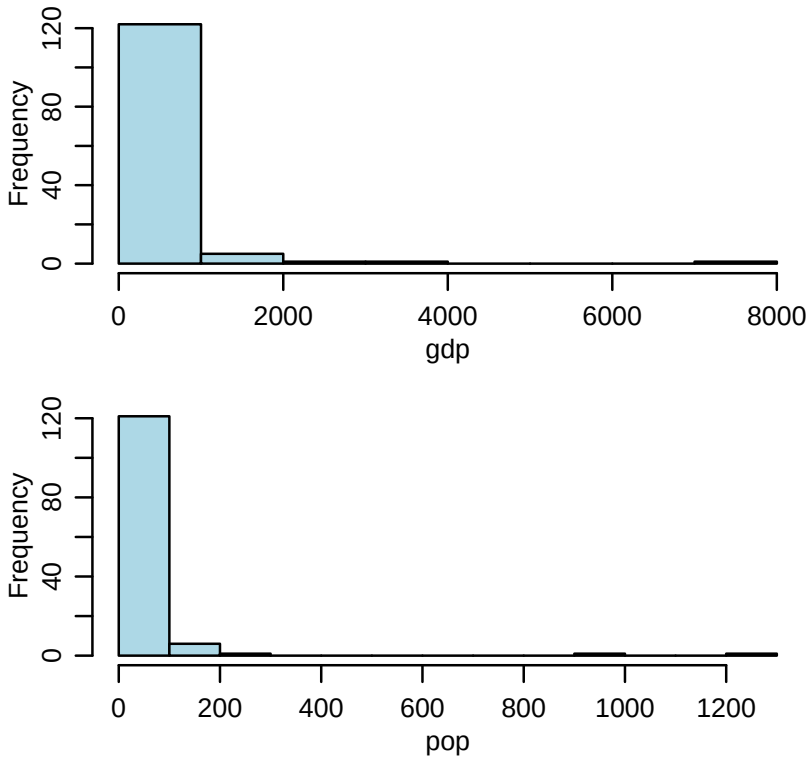

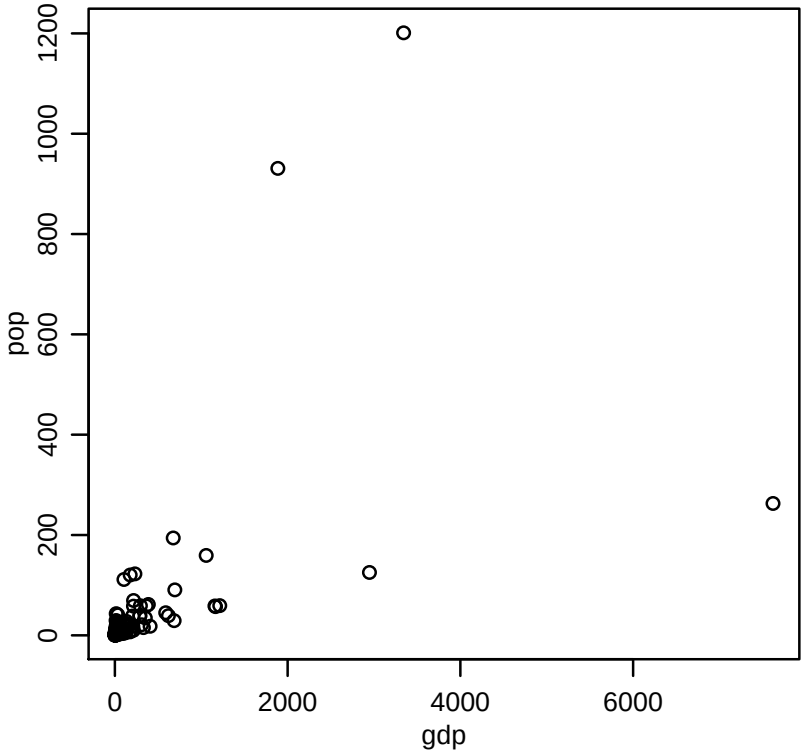

Why is this not a good plot?

GDP and population

Q: How can we visualze all of the data?

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```
lpop<-log(pop)
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```

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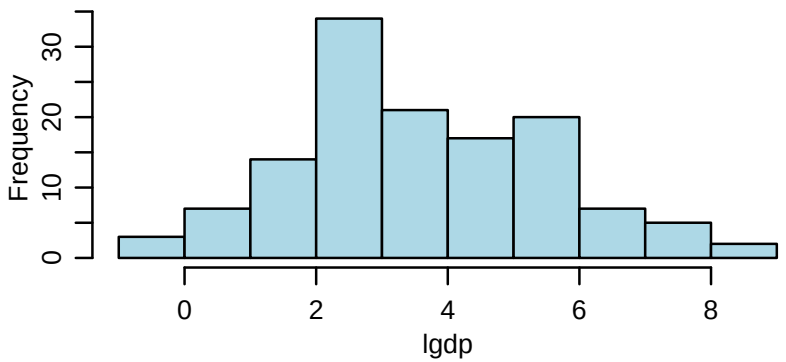
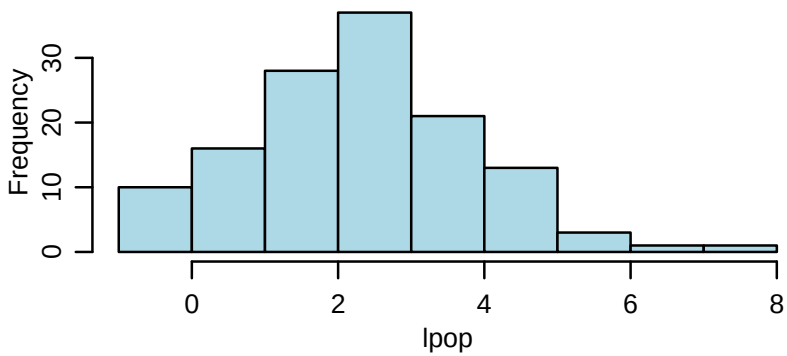
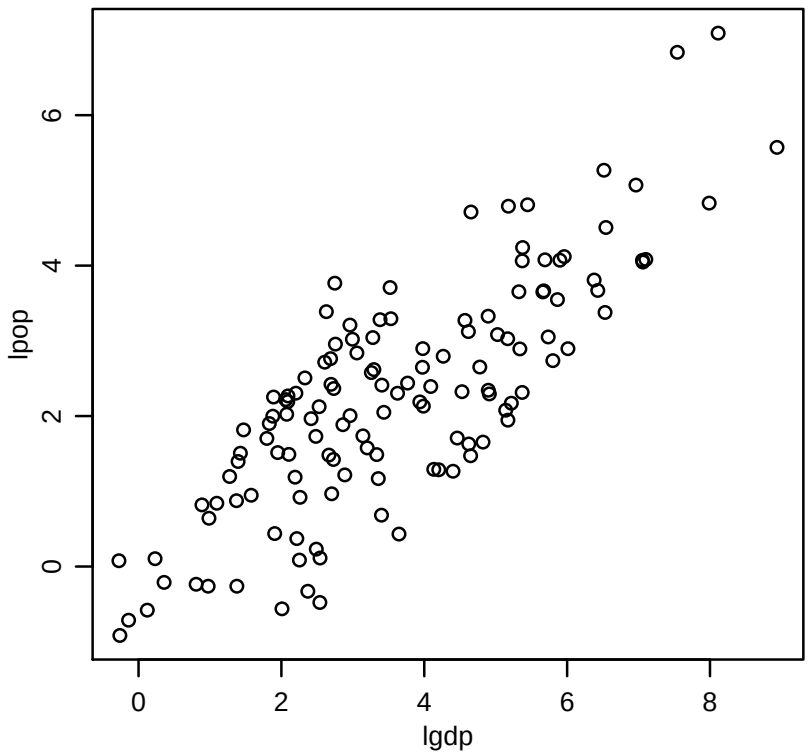


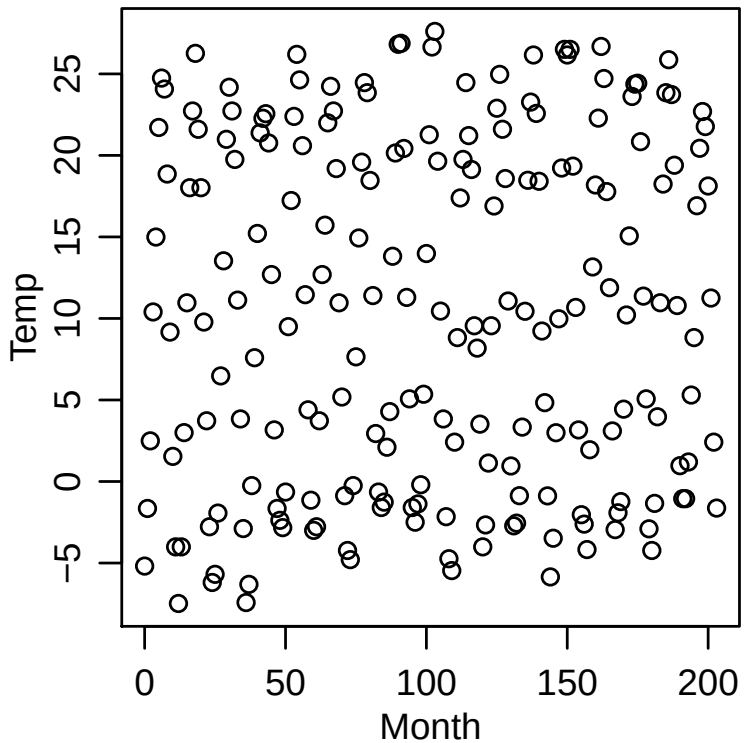




transformations

Soil temperature

Monthly soil temperature in Mitchell, Nebraska (1976-1992)



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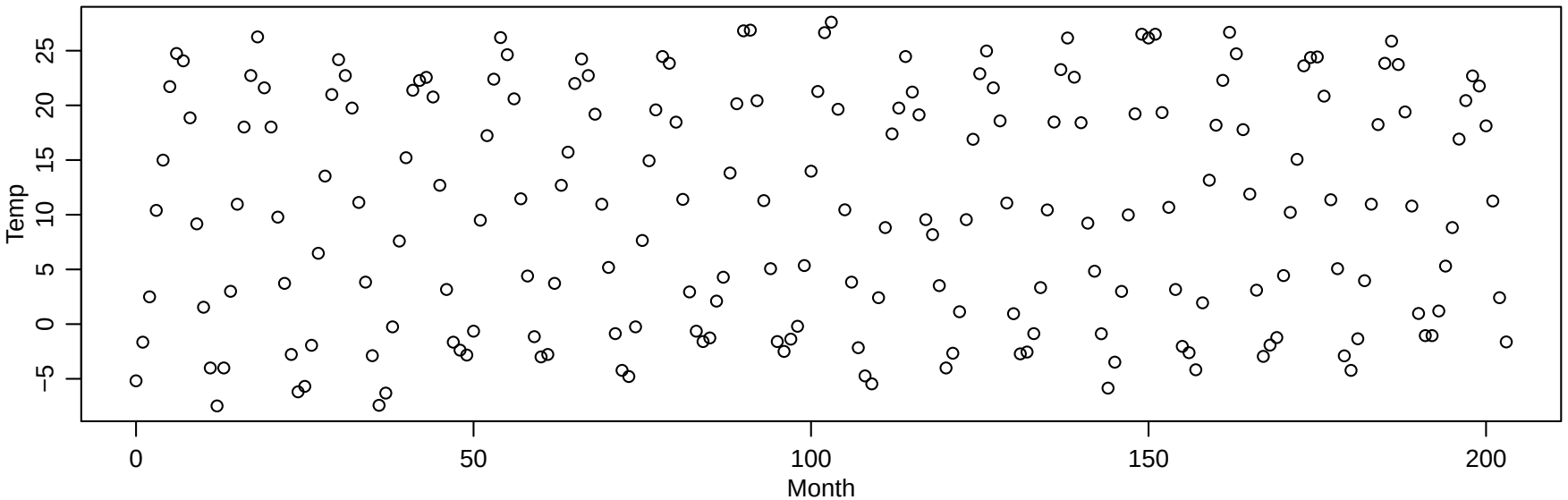

scaling

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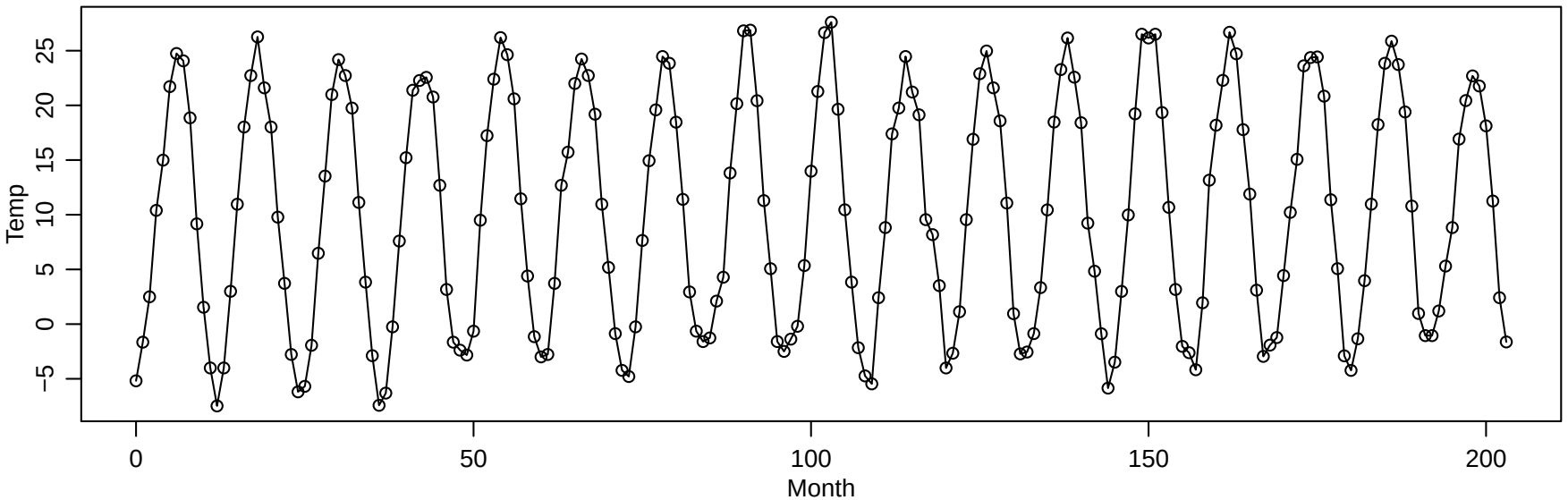

scaling , lines

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