Solutions: Box Plots and Scatter Plots

1 Load the Hot Dog Data

```
myFile <- "hotdog.csv"
hd <- read.csv(file = myFile,
               skip = 1,
               nrows = 54,
               header = TRUE)

hd$Day <- factor(hd$Day,
                 levels = c("Mon", "Tue", "Wed", "Thu", "Fri"))
```

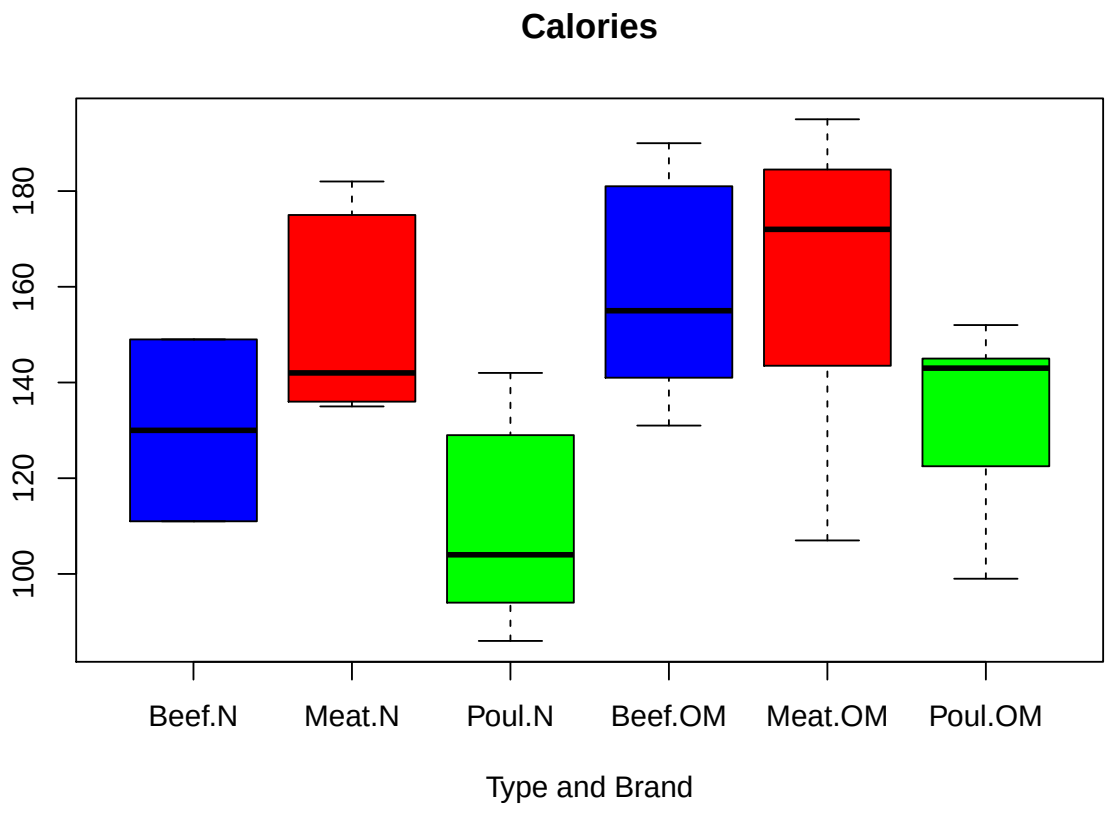
1.1 Solutions

1. What do the arguments '`skip=`', '`nrows=`' and '`header=`' do in the `read.csv()` function?
   - `skip=`: number of lines to skip from the beginning of csv file
   - `nrows=`: number of rows to read (after the skip) from the csv file
   - `header=`: if TRUE, first row that is read contains column names
2. Why do we reorder the levels of the `Day` column?
   - The levels are automatically set to alphabetical order when using the `read.csv()` function. We prefer them to be in a meaningful order.
3. **True or False**: We reorder the levels of the `Day` column by overwriting the original column?
   - TRUE

2 Box Plots

Blanks should be filled in as:

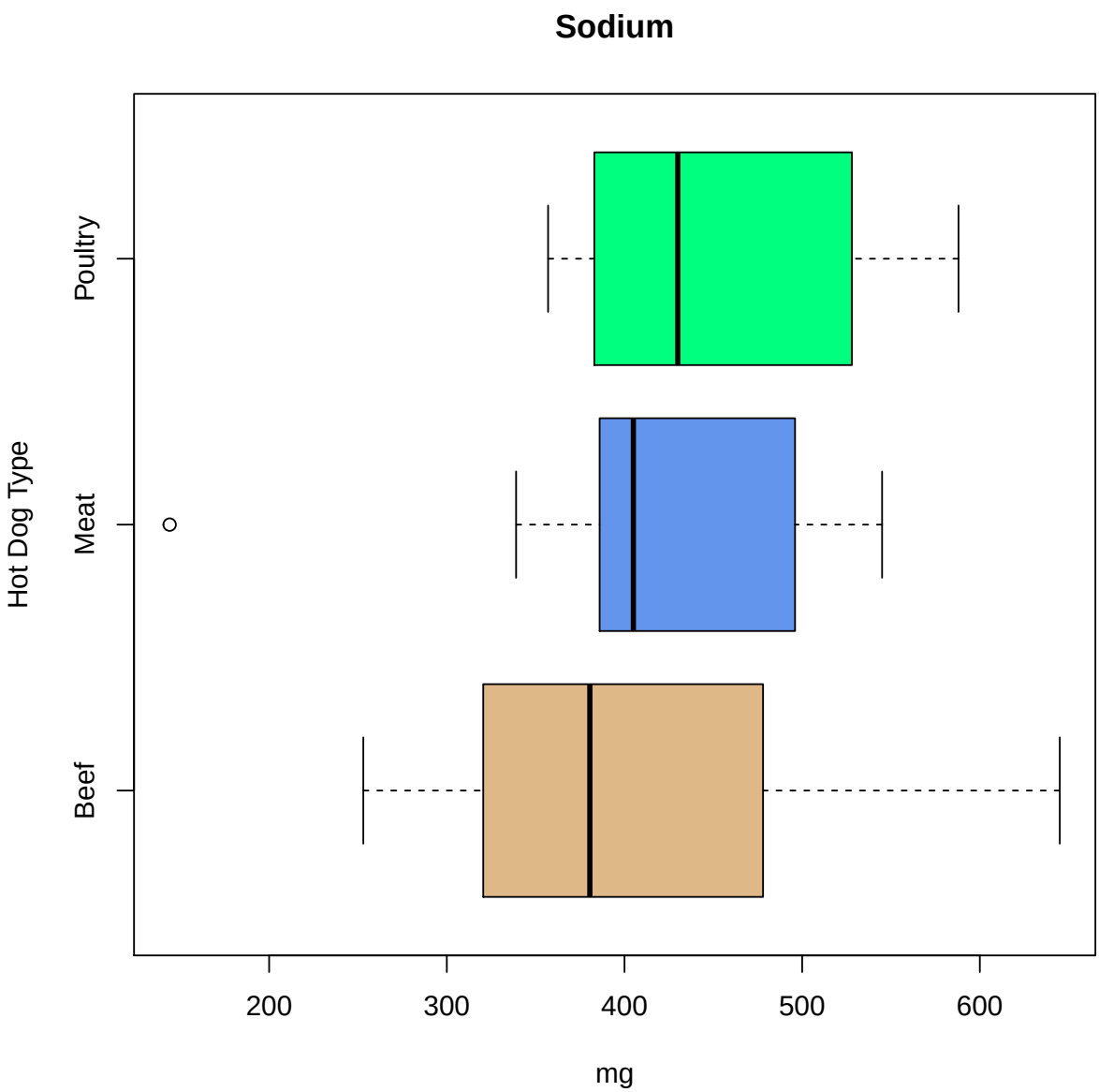
```
boxplot(Calories ~ Type * Brand,
        data = hd,
        main = "Calories",
        xlab = "Type and Brand",
        col  =  c("blue"  ,"red"  ,"green"  ,"blue"  ,"red"  , "green"),
        xaxt = "n")

x.ticks <- c("Beef.N", "Meat.N", "Poul.N", "Beef.OM", "Meat.OM", "Poul.OM")

axis(side = 1,
     at = 1:6,
     labels = x.ticks)
```



2.1 Solutions

1. What does the argument '`axt = "n"`' do in the `boxplot()` function?
    - Removes the x-axis tick marks and tick labels.
2. What do the arguments '`side = 1`' and '`at = 1:6`' do in the `axis()` function?
    - `side = 1`: references the bottom axis (i.e., x-axis)
    - `at = 1:6`: tells it to place a tick mark at the points 1 to 6
3. Create a box plot of `Sodium` by `Type`. Include the following:
    - A main title
    - Custom x and y axes titles
    - Make the box plots horizontal
    - Different colors for each hot dog type

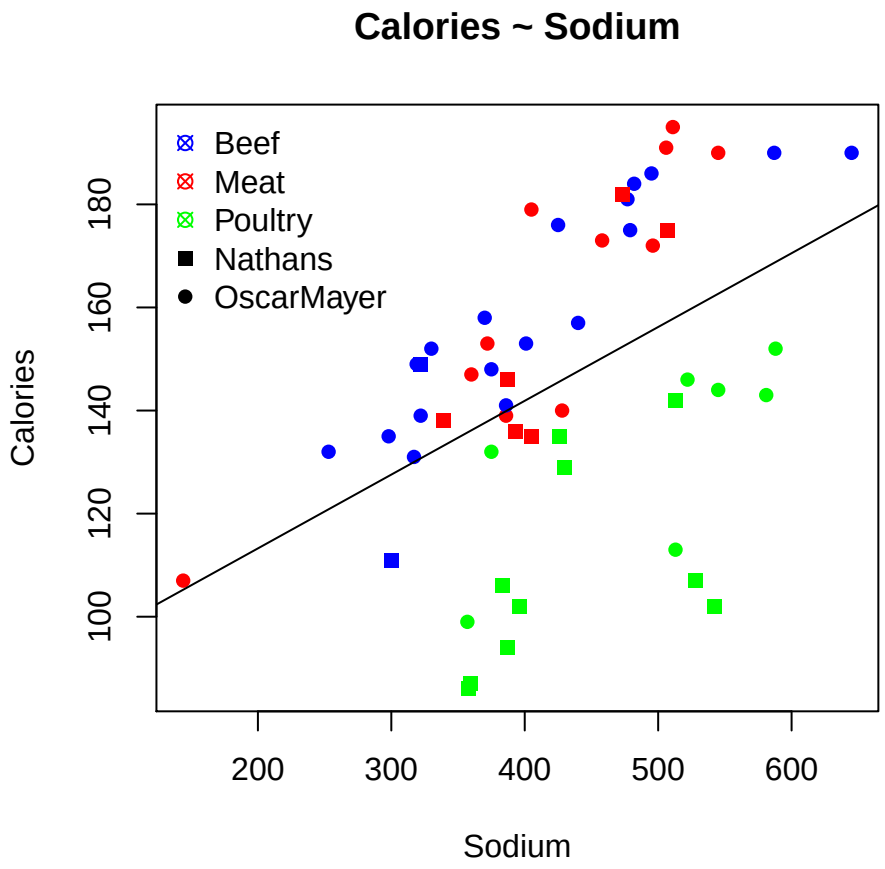
```
boxplot(Sodium ~  Type,
        data = hd,
        horizontal = TRUE,
        main = "Sodium",
        xlab = "mg",
        ylab = "Hot Dog Type",
        col = c("burlywood", "cornflowerblue", "springgreen"))
```


Sodium
Hot Dog Type
Poultry
Meat
Beef
200
300
400
500
600
mg

3 Scatter Plots

Blanks should be filled in as:

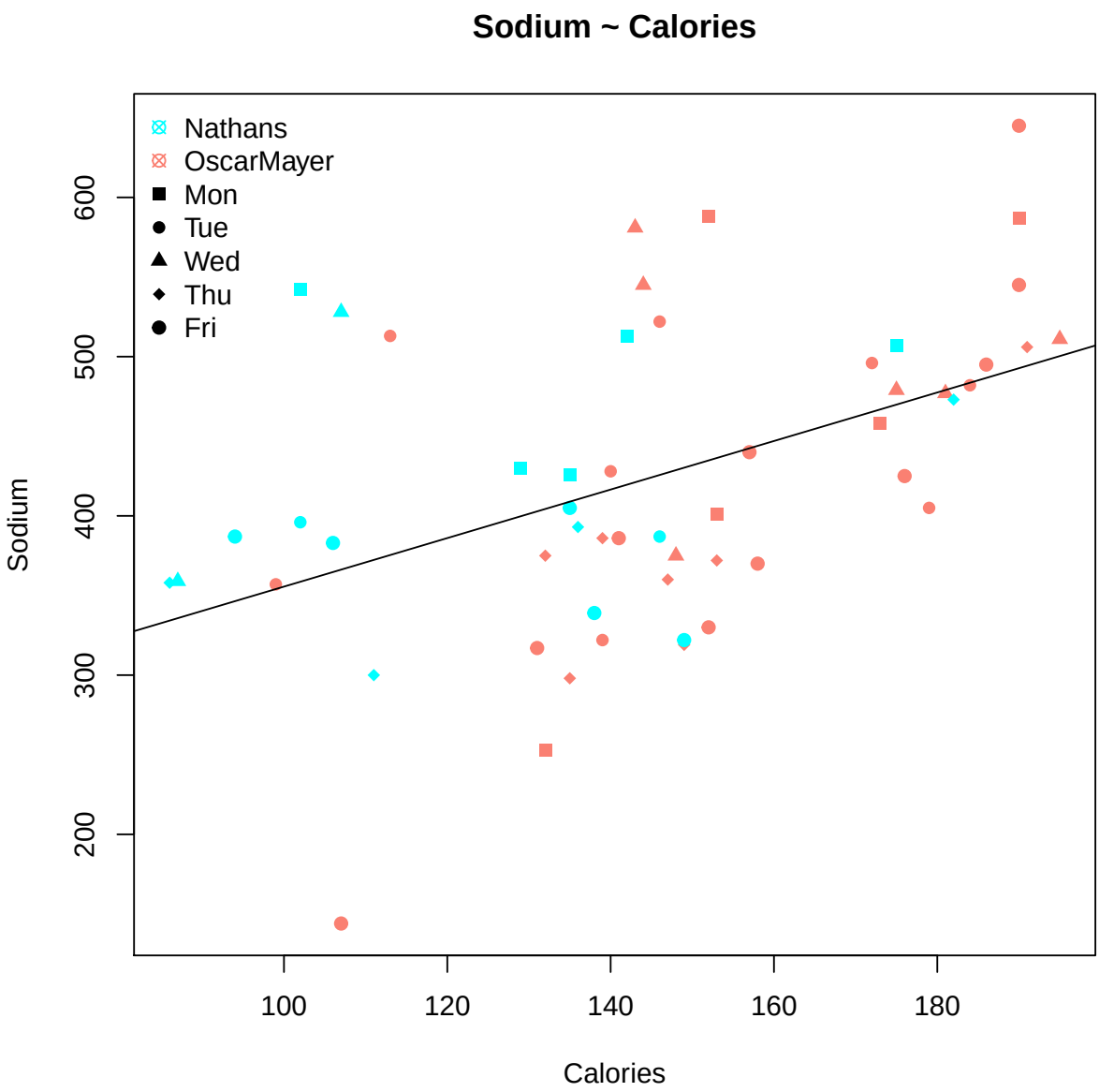
```
plot(Calories ~ Sodium,
     data = hd,
     pch = c(15, 16)[hd$Brand],
     col = c("blue", "red", "green")[hd$Type],
     main = "Calories ~ Sodium")

abline(lm(Calories ~ Sodium, data = hd))

legend(x = "topleft",
       legend = c(levels(hd$Type), levels(hd$Brand)),
       pch = c(rep(13, 3), 15, 16),
       col = c("blue", "red", "green", "black", "black"),
       bty = "n")
```



3.1 Questions and Challenges

1. What does the argument '`pch=`' do in the `plot()` function?
   - Defines the point character (i.e., the point's shape/symbol).
2. What does the command '`c(15, 16)[hd$Brand]`' do?
   - Creates a vector where a 15 or 16 is repeated for each level of hd$Brand.
3. Instead of using '`x = "topleft"`' in the `legend()` function what can you use?
   - Another string: `"topright"`, `"bottomleft"` or `"bottomright"`
   - Use both '`x=`' and '`y=`' arguments to specify a point on plot
4. What does the argument '`bty=`' do in the `legend()` function?
   - Specifies whether or not a box should be drawn around the legend (`"o"` = box, `"n"` = no box).
5. Create a scatter plot of `Sodium` and `Type`. Include the following:
   - `Sodium` on the y-axis, `Calories` on the x-axis
   - A main title
   - Different shapes for each day (hint: `pch`)
   - Different colors for each brand
   - **Bonus**: Add a line of best fit and a legend

```r
plot(Sodium ~ Calories,
     data = hd,
     main = "Sodium ~ Calories",
     pch = c(15, 16, 17, 18, 19)[hd$Day],
     col = c("cyan", "salmon")[hd$Brand])
# BONUS
abline(lm(Sodium ~ Calories, data = hd))
legend(x = "topleft",
       legend = c(levels(hd$Brand), levels(hd$Day)),
       pch = c(13, 13, 15:19),
       col = c("cyan", "salmon", rep("black", 5)),
       bty = "n")
```


Sodium ~ Calories
Nathans
OscarMayer
Mon
Tue
Wed
Thu
Fri
Sodium
200
300
400
500
600
100
120
140
160
180
Calories

R Session Information

```
R version 3.0.2 (2013-09-25)
Platform: x86_64-apple-darwin10.8.0 (64-bit)

locale:
[1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8

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

other attached packages:
[1] knitr_1.5

loaded via a namespace (and not attached):
[1] digest_0.6.4   evaluate_0.5.1 formatR_0.10   highr_0.3
[5] stringr_0.6.2  tools_3.0.2
```