Daphnia Lab

Bio 103

R Setup

- Make a new R project. If you are using a computer that does not belong to you make this project on your flash drive.

Enter your data

- Use google sheets to enter your data.
- You should have four sheets - one for ambient, and one for each treatment.
- Save each sheet in the folder containing your R project.
- Load your data into R.

Your data *for each dataset* should look like the following. Make sure each dataset has its own variable name.

```
##    Time.min.   Ice HeartRate.count.10sec.
## 1        0.5  TRUE                    40
## 2        1.0  TRUE                    39
## 3        1.5  TRUE                    35
## 4        2.0  TRUE                    24
## 5        2.5  TRUE                    12
## 6        3.0  TRUE                     3
## 7        3.5  TRUE                     1
## 8        4.0  TRUE                     2
## 9        4.5  TRUE                     3
## 10       5.0  TRUE                     2
## 11       5.5 FALSE                     2
## 12       6.0 FALSE                     4
## 13       6.5 FALSE                     3
## 14       7.0 FALSE                    10
## 15       7.5 FALSE                    12
## 16       8.0 FALSE                    16
## 17       8.5 FALSE                    15
## 18       9.0 FALSE                    26
## 19       9.5 FALSE                    36
## 20      10.0 FALSE                    41
```

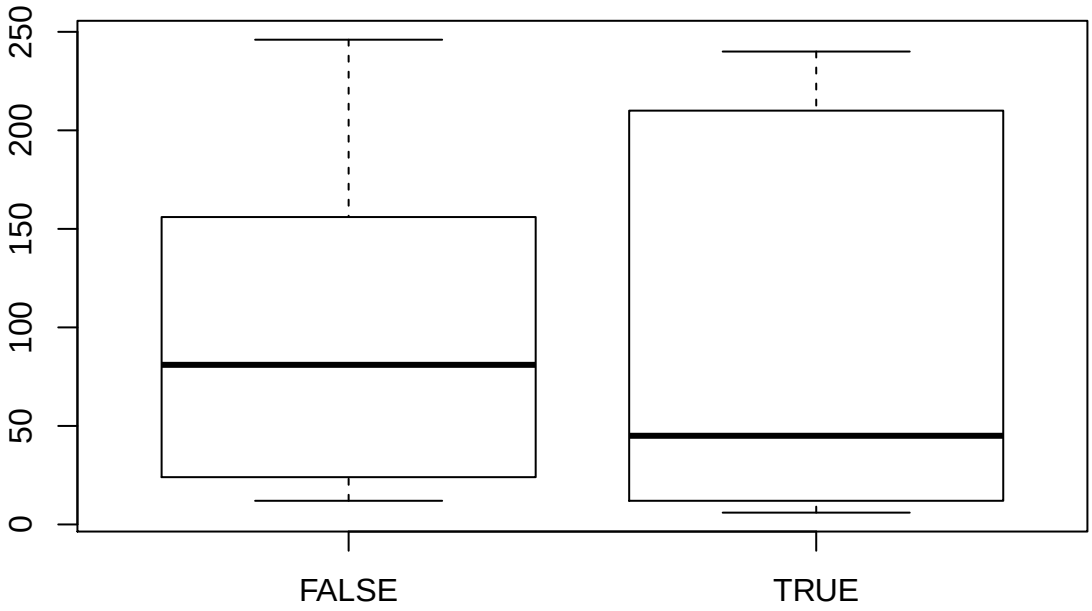
Transform your data

- *For each dataset* calculate heartbeats per minute by multiplying your heart beat counts by 6. Assign this to a new column (column name comes after $) in your data table.

```
HB_Linda_data$HeartRate_min<-6*HB_Linda_data$HeartRate.count.10sec.
```

Using just the Ice treatment data compare Daphnia HR per minute for the time the Daphnia was on ice to the time it was not on ice. The boxplot function takes some observation as a function of a treament, for a given dataset.

```
boxplot(HeartRate_min ~ Ice, data = HB_Linda_data)
```

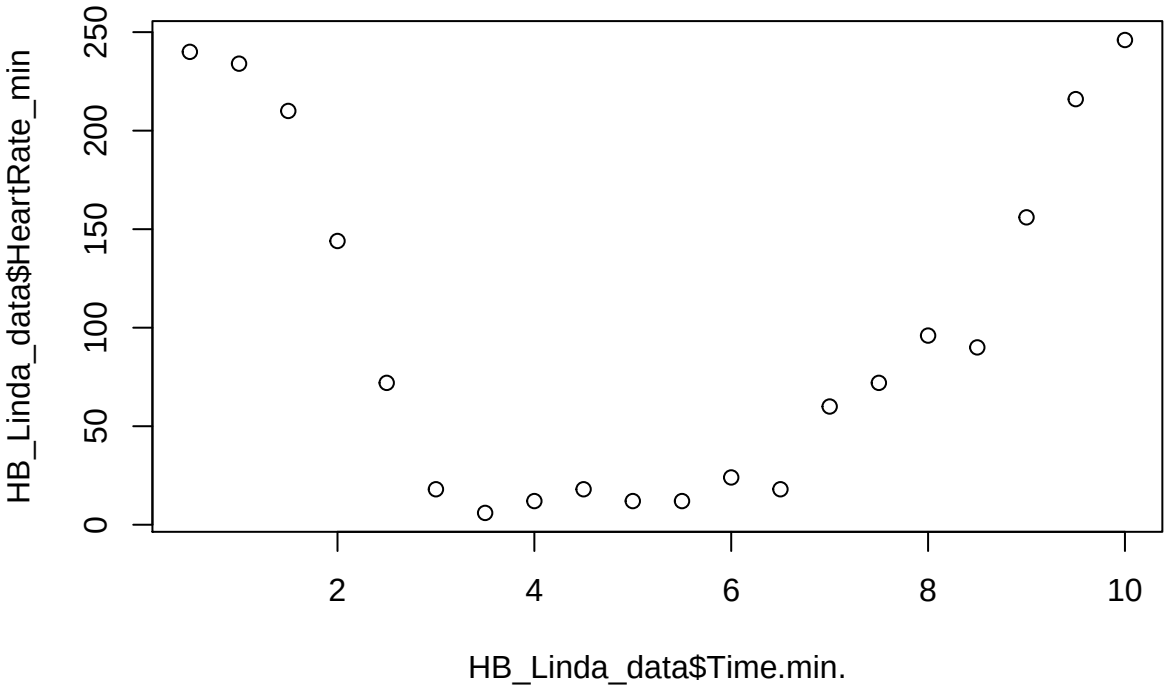


- What does this tell you about the effect of the treatment on heart rate?
- Is there a difference between treatment and not?
- What could be obscuring a treatment effect?

You might have noticed it took some time for your Daphnia's heartrate to stabilize under the treatment condition (or when you removed the treatment).

- Graph the change in heartrate over time to determine the "real" heartrate given the treatment.

```
plot(HB_Linda_data$Time.min.,HB_Linda_data$HeartRate_min)
```



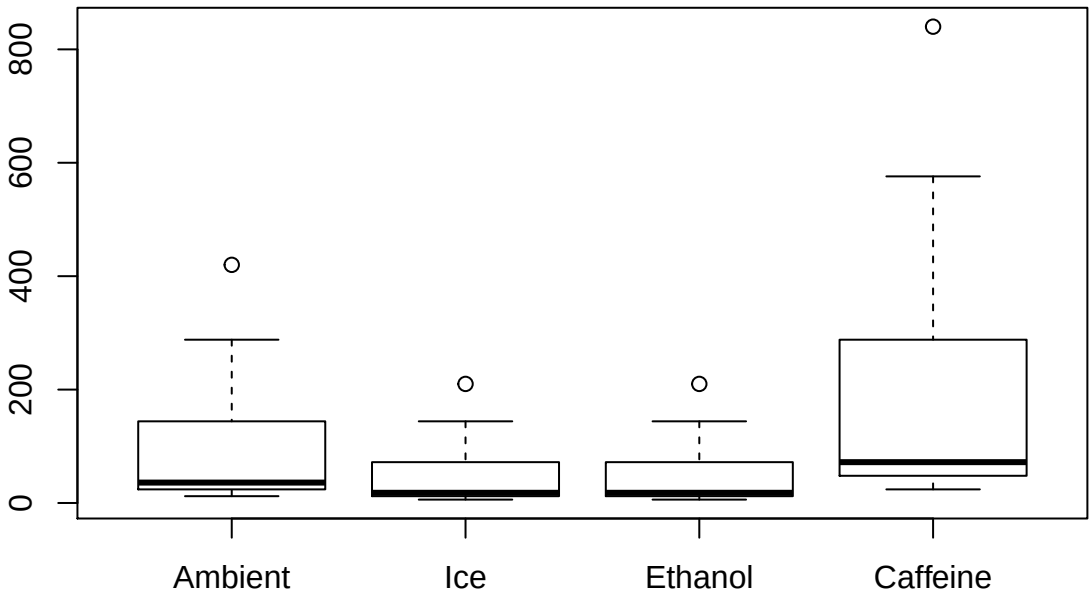
- Based on this plot decide at which times the heartrate is fully affected by the treatment. Calculate the mean heartrate for this subset of the data (note the row numbers for these times). You will be able to extract the subset of the data (for example rows 3-12 (i.e. 1.5 - 6 minutes) using the following. Note you might not want to use this this same subset of data.

```
my_data_frame[3:12]
```

- Repeat for all treatments
- Include axis labels with units. Be sure your units are correct; present your data in a standardized format using beats per minute (BPM).
- Put the data from all the treatments into a new data frame so you can plot it.

```
sub_results <-data.frame(HB_Linda_data_Amb$HeartRate_min[3:12],
                    HB_Linda_data$HeartRate_min[3:12],
                    HB_Linda_data_Eth$HeartRate_min[3:12],
                    HB_Linda_data_Caff$HeartRate_min[3:12])
colnames(sub_results) <- c('Ambient','Ice','Ethanol','Caffeine')

boxplot(sub_results)
```



- Include axis labels with units. Be sure your units are correct; present your data in a standardized format using beats per minute (BPM).
- Save your plots as pdf files using the pdf function (not the export button).