

Practical Exercises for Day 5

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Exercise 14

- Load the below data set and for further information check the command `?water`.

```
# install.packages("HSAUR3")  
library("HSAUR3")  
data("water")  
str(water)  
head(water)  
summary(water)
```

- Try to plot the variables `mortality` against `hardness` from the `water` data set.
- Add a main title to the above plot (`mortality` against `hardness`).
- Change the ...
 1. font size of the axis annotation
 2. font size of the x- and y-axis labels
 3. the point sizes within the plot... of the above plot (`mortality` against `hardness`).
- Looking at the above plot: Do you think the two variables `hardness` and `mortality` correlate? What function do you use to find out the correlation coefficient? Do they have a positive or a negative correlation coefficient? How do you interpret the correlation coefficient in your own words?
- In the `water` data set, can you graphically find out if there is a difference between the the two variables `hardness` and `mortality` conditional on the `location` (`North`, `South`).
- Add a legend to the above plot so that you can easily differentiate the locations (`North` or `South`) of the observations.

- Do a barplot of the variable `location` from the `water` data set.
- ADDITIONAL: Try if any of these following plotting functions can be applied to the data sets `perulung` or `ToothGrowth`.

```
install.packages("graphics")
library("graphics")
?coplot
#
# install.packages("lattice")
library("lattice")
?xyplot
#
?interaction.plot
```

Exercise 15

- Download the .R file `ANOVA_with_chickwts.R` from the switch drive and have another look on how we applied the `anova` to the `chickwts` data set.
- Load the `ToothGrowth` data set into R and encode the numeric variable `dose` as a factor variable. Define the new factor variable as `dose.fac` with the three levels `low`, `med` and `high` and add it to the data frame of `ToothGrowth`.
- Visualize the variable `len` per dose level in a boxplot.
- With the help of the R-commands written in the `ANOVA_with_chickwts.R` file, apply a analysis of variance (ANOVA) to the data set `ToothGrowth`

Exercise 16

- Download the .R file `LM_with_water.R` from the switch drive and have another look on how we applied the linear model to the `water` data set.
- Reuse these commands to fit a simple as well as multiple linear regression model to the data set of `perulung_ems`. Use `fev1` as your response variable y .