

## Lab 5: Part 2

The aim of this part of the lab exercise is to give you practical experience in ANOVA and ANCOVA using R Studio and an R Notebook.

### 1 ANOVA and ANCOVA

In this lab you will use a data set that contains information on 78 people using one of three diets.

The data includes the following variables:

- `Person Participant id`
- `gender Gender`, 1 = male, 0 = female
- `Age Age` in years
- `Height Height` in cm
- `preweight Weight` before the diet (kg)
- `Diet Diet` type
- `weight6weeks Weight` after 6 weeks (kg)

1. Load the `diet_r.csv` data into an R notebook.
2. Explore the data. Confirm that variables that are categorical and numerical/continuous are appropriately imported. You may need to manually change their type.
3. Test the hypothesis that there is a difference in weight before and after the diet.
4. Compute a new variable that contains the weight lost in Kg.
5. Use ANOVA and ANCOVA to model the relationship between the amount of weight lost and the participants' physical measurements and/or demographics. Consider potential interactions.
6. Once you have a suitable model, explain the relation between the variables.

## 2 R commands and syntax

```
1 #reading in a csv file
2 df<-read.csv("name-of-csv-file")
3
4 #anova model
5 aov(y~x)
6
7 #plots for an anova model
8 plot(aov(y~x))
9
10 #anova model details
11 summary(aov(y~x))
12 summary.lm(aov(y~x))
13
14 #ancova models
15 lm(y~x+z)
16
17 #for models with ineractions
18 lm(y=x*z)
19
20 #If there are two samples – testing for equal means
21 # R will handle non-equal variances
22 t.test(variable1 , variable2)
```