

# Lab 10

## Cats

Run the following code to import the *cats* data set from the “MASS” library.

```
> library(MASS)
> data(cats)
```

The data set includes 3 variables: Sex, Body weight (kg) and heart weight (g). These variable can be found with the `str()` function. Create a linear model where heart weight is the dependent variable and body weight is the independent variable. What is the intercept and the slope of this model? How can you interpret the slope of this model?

Now draw a scatter plot with this data and insert this linear model into it. (Hint: `abline()`). Try to distinguish the sex of the cats in the scatter plot by using the `points()` function.

Predict the heart weight of a cat that is 3.5 kilograms. Can you accurately predict the heart weight of a cat that is 6.5 kilograms?

## Mtcars

First, model the mpg variable on hp and then model the mpg variable on wt. Check the summary commend for both of the models.

```
data(Mtcars)
```

## Wage

Run the following code to import the *Wage* data set from the “ISLR” library.

```
> library(ISLR)
> data(Wage)
```

Explore the variables of the dataset using `str()` or with `?Wage`. Build a regression model where wage is the dependent variable and age, job class (which has 1 for Industrial and 2 for Information) and education are the independent variable. How can we interpret the slope of age? Keep in mind that this definition will be slightly different then the previous ones as we have multiple variables in the model.

## Hsb

Run the following code to import the *hsb* data set from the “faraway” library.

```
library(faraway)
data(hsb)
```

Build a linear regression model for the response variable “science”. Use all the other variables in the dataset as independent variables.