

## Exam exercise: Houseprices

You may use the combined lecture notes for this module available at <https://asta.math.aau.dk> to guide you to the relevant methods and R commands for this exam.

Remember to load the `mosaic` package first:

```
library(mosaic)
```

In this exercise you will study the data described in Agresti EXAMPLE 9.10.

You are studying house sales in Gainesville, Florida, where among other things the data contain the selling price (`Price`), property taxes (`Taxes`) and house size (`Size`).

Read in the data:

```
HousePrices <- read.delim("https://asta.math.aau.dk/datasets?file=HousePrice.txt")
head(HousePrices)
```

```
##   Taxes  Price Size
## 1  3104 279900 2048
## 2  1173 146500  912
## 3  3076 237700 1654
## 4  1608 200000 2068
## 5  1454 159900 1477
## 6  2997 499900 3153
```

- Make a relevant plot of the variables and discuss how they are related.
- Explain the concept of correlation and determine whether there is significant positive correlation between `Taxes` and `Size`.

```
## Delete this line and write a command using cor.test(...)
```

Fit a multiple regression model with `Price` as the response variable and `Taxes` and `Size` as predictors.

```
## Delete this line and write a command using lm(...)
```

- What are the parameters of the model and what is the interpretation of these parameters?
- What is the prediction equation?

$$\hat{y} =$$

Explain the output of

```
summary(model)
```

where `model` is the fitted multiple regression model. This explanation should as a minimum include

- Calculation of `t` value and determination and interpretation of p-value.
- Interpretation of Multiple R-squared.
- How the table of output can be used to construct confidence intervals for parameters. This should be supplemented by actual calculation for the current data using `confint`.

Finally, you have to investigate whether or not there is an interaction between the effect of `Taxes` and the effect of `Size` as predictors of `Price`.