

# Simple template for R Markdown

## for Advanced Methods for Regression and Classification

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##General information:

R Markdown conveniently combines R code with textual explanations (in Latex or html coding). This will be useful for our exercises, but is really useful in general when you would like to have documented R output. Solve the tasks with R code, and place short comments to answer the questions. There is no need for producing a fancy document. Keep things as simple as possible. Always show the (relevant) R code - never hide it.

R and R-Studio need to be installed, as well as L<sup>A</sup>T<sub>E</sub>X (e.g. for Windows as Miktex <https://miktex.org/> and for Linux as TexLive <https://www.tug.org/texlive/>). Then open this file in R-Studio with *File - Open File*, and press the button *Knit*. The result is a pdf file.

**Submit both, the .Rnw and the .pdf file to TUWEL.**

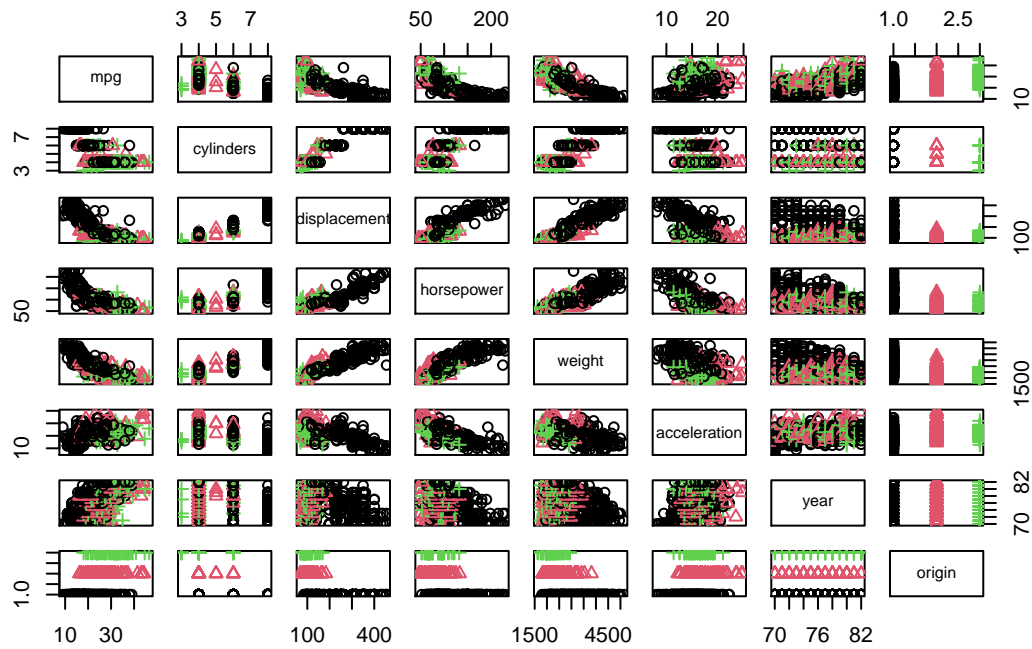
## Some simple examples:

### Load and plot data:

```
data(Auto, package="ISLR")
x <- Auto[, -9]
```

Plot the selected data, with origin as color and symbol:

```
plot(x, col=x$origin, pch=x$origin)
```



## Estimate the correlation matrix of the numeric variables

Pearson: investigates linear relationships (default)

```
cor.pearson <- cor(x)
```

Kendall: investigates non-linear relationships

```
cor.kendall <- cor(x, method = "kendall")
```

Do eigen-decomposition and compare eigenvalues:

```
eigen.pearson <- eigen(cor.pearson)
eigen.kendall <- eigen(cor.kendall)
plot(eigen.pearson$values, eigen.kendall$values,
     xlab="Eigenvalues from Pearson", ylab="Eigenvalues from Kendall")
abline(c(0,1), col=4, lty=2)
```

