

# Einführung in R und RStudio

## [Termine 5 & 6]

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**▶ Termin 1 & 2**

- ▶ Grundlagen
- ▶ Datentypen

**▶ Termin 3 & 4**

- ▶ Objekten
- ▶ Lesen und Schreiben

**▶ Termin 5 & 6**

- ▶ Statistiken
- ▶ Graphiken (1)

**▶ Termin 7 & 8**

- ▶ Graphiken (2)
- ▶ Fortgeschrittenes Programmieren
- ▶ Abschluss

## ▶ Datenformat

- ▶ csv (comma-separated values)
- ▶ ods (OpenDocument spreadsheet)
- ▶ xlsx (Excel spreadsheet)

## ▶ Datenstruktur

- ▶ Spalten-orientierte Tabelle (Datenbank-Liste)
- ▶ Pivot-Tabelle (Kreuztabelle)

## Pivot Tabellen und Zusammenfassungen

- ▶ Packae tidyrr
  - ▶ pivot\_longer()
  - ▶ pivot\_wider()
- ▶ Package stats
  - ▶ aggregate()

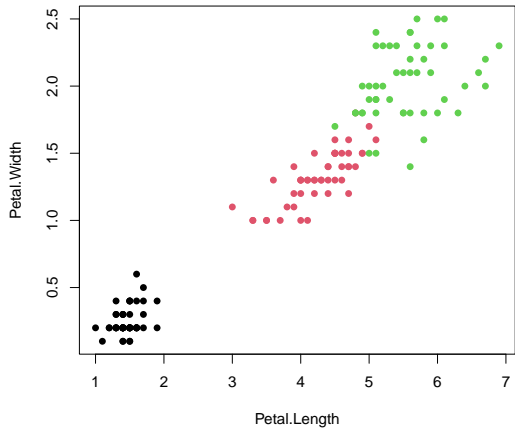
```
aggregate(Gesamt ~ StadtBezirk,  
          data = Bevoelkerung,  
          FUN = sum)
```

```
##      StadtBezirk Gesamt  
## 1              Bonn 466564  
## 2 Bad Godesberg 228717  
## 3              Beuel 203412  
## 4      Hardtberg 103845
```

- ▶ Deskriptive Statistik
  - ▶ Explorative Datenauswertung
- ▶ Hypothesen Test
  - ▶ Parametrische Statistik
  - ▶ Nicht-parametrische Statistik
- ▶ Modellierung
- ▶ Multivariate Statistik

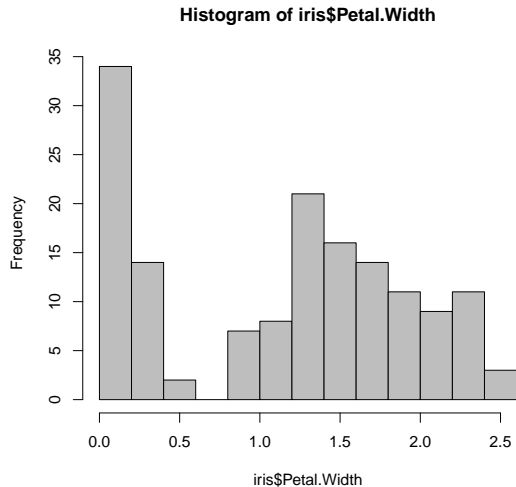
## scatterplots

```
plot(iris[, c("Petal.Length", "Petal.Width")],  
     col = iris$Species, pch = 16)
```



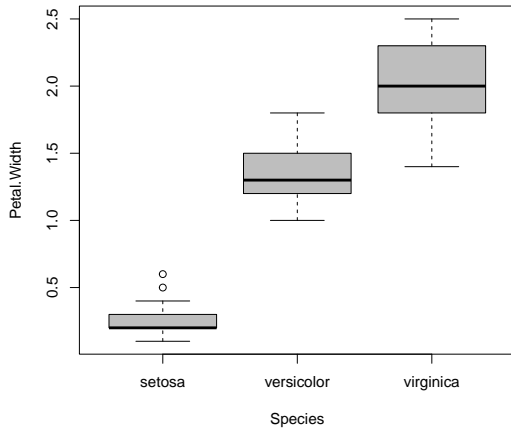
## histograms

```
hist(iris$Petal.Width, col = "grey")
```



## box plots

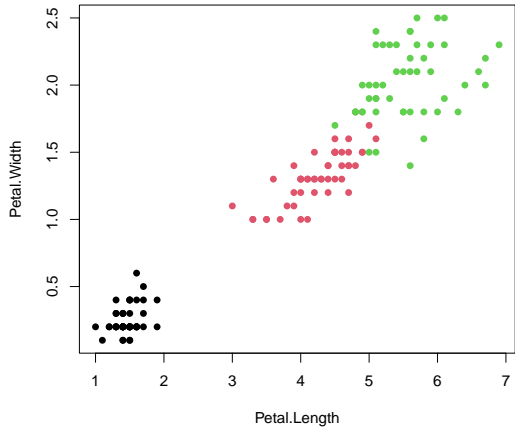
```
boxplot(Petal.Width ~ Species,  
        data = iris, col = "grey")
```





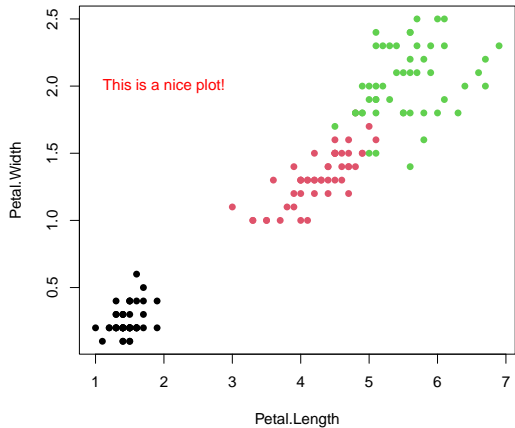
## High Level Functions

```
plot(iris[, c("Petal.Length", "Petal.Width")],  
     col = iris$Species, pch = 16)
```



## Low Level Functions

```
text(2, 2, label = "This is a nice plot!",
     col = "red")
```



▶ High Level Functions

- ▶ `plot()`
- ▶ `hist()`
- ▶ `barplot()`
- ▶ `pie()`
- ▶ `boxplot()`

▶ Low Level Functions

- ▶ `text()`
- ▶ `points()`
- ▶ `axis()`
- ▶ `mtext()`

## Some Links

[R Base Graphics](#)

[R Color Chart](#)

# Vielen Dank!

```
library(fortunes)
fortune(269)
```

```
##
## Knut Krueger: Is there any function available to combine those p values?
## Stephan Kolassa: ?"+"
##      -- Knut Krueger and Stephan Kolassa (about ways to combine p values from
##          different tests)
##          R-help (July 2010)
```