

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()

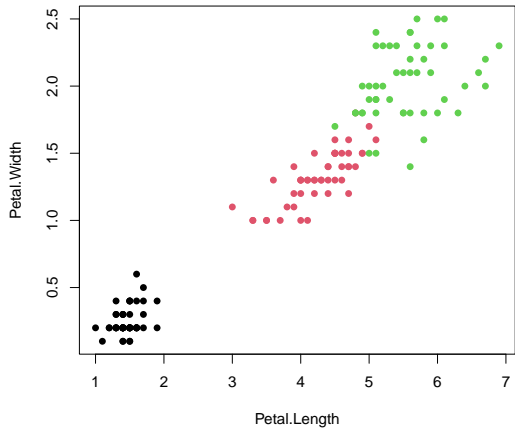
```
aggregate(Gesamt ~ StadtBezirk,  
          data = Bevoelkerung,  
          FUN = sum)
```

```
##      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

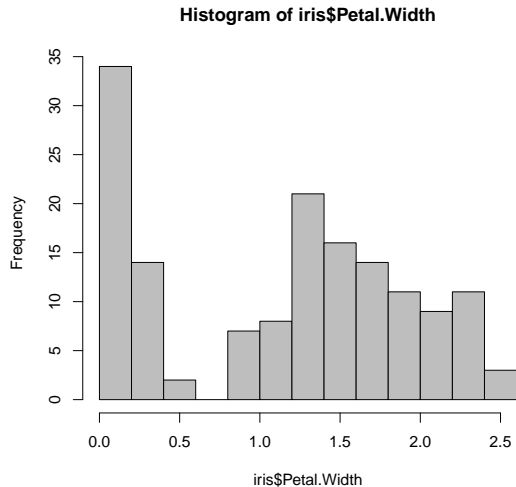
scatterplots

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



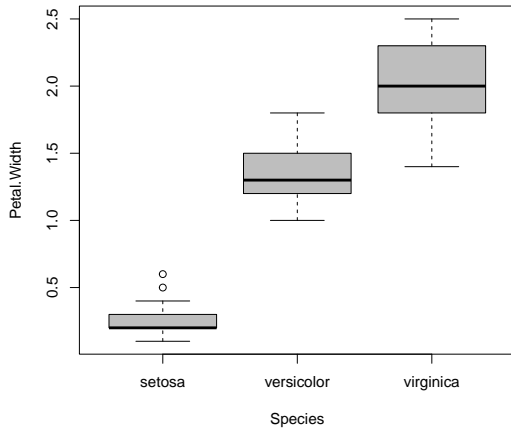
histograms

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



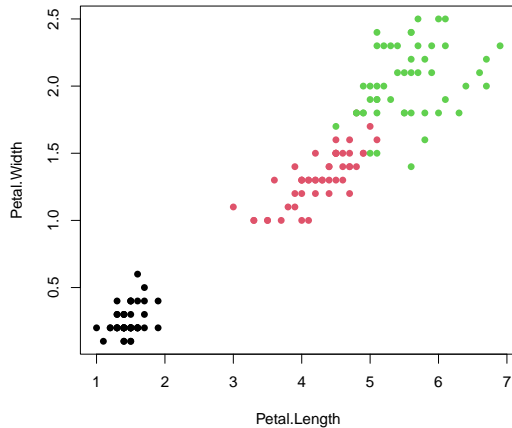
box plots

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



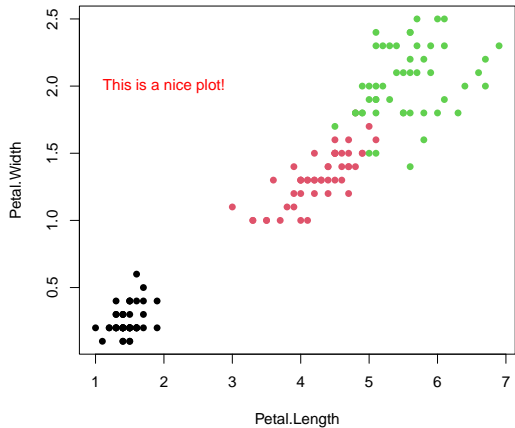
High Level Functions

```
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)
```