

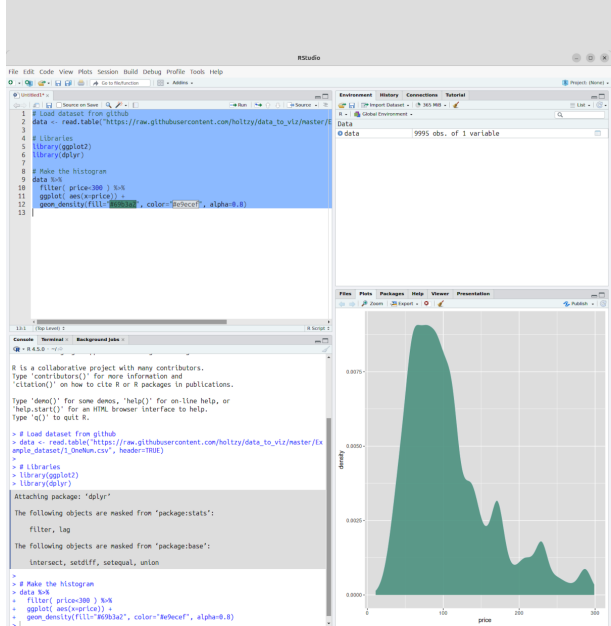


Einführung in R und RStudio

[Termin 1]

Miguel Alvarez

15. Mai 2025





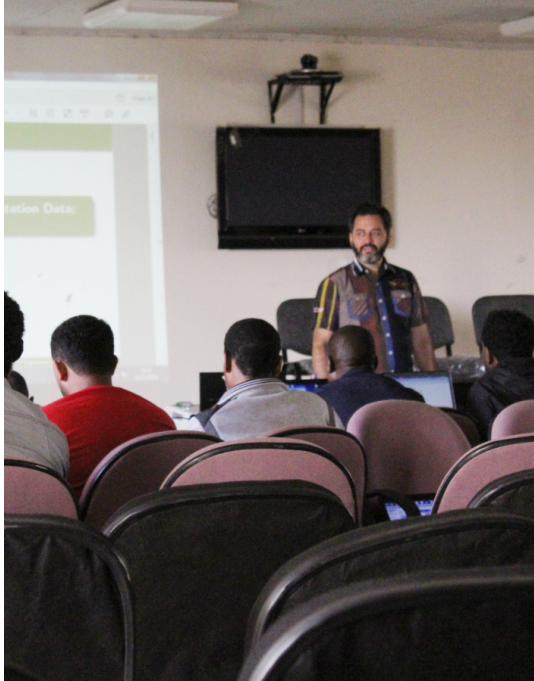
Der Kurs

18:00 – 20:30

Pause 19:15 – 19:30

- Methoden
 - Vortrag
 - Life-Codierung
 - Übungen

<https://rstats.kamapu.net/>





Der Kurs

■ Termin 1

- Grundlagen von R
- Einführung in RStudio

■ Termin 2

- Vektorenklassen
- Objekten

■ Termin 3

- Daten Lesen und Schreiben
- Datenstrukturierung

■ Termin 4

- Explorative Datenanalyse (EDA)
- Datenvisualisierung

■ Termin 5

- Syntax in tidyverse
- Grafiken mit ggplot2

■ Termin 6

- Funktionen selber definieren
- *To loop or not to loop*

■ Termin 7

- Jocker-Karte

■ Termin 8

- Schluss



Der Kurs

Miguel Alvarez

- Vegetationsökologist
- Datenwissenschaftler
- KI-Experte
- R (und Python) Programmierer
 - Umwelt und Biodiversität
 - Geographische Informationssysteme
 - Datenbanken
 - Reproduzierbarkeit

Open Source Aktivist



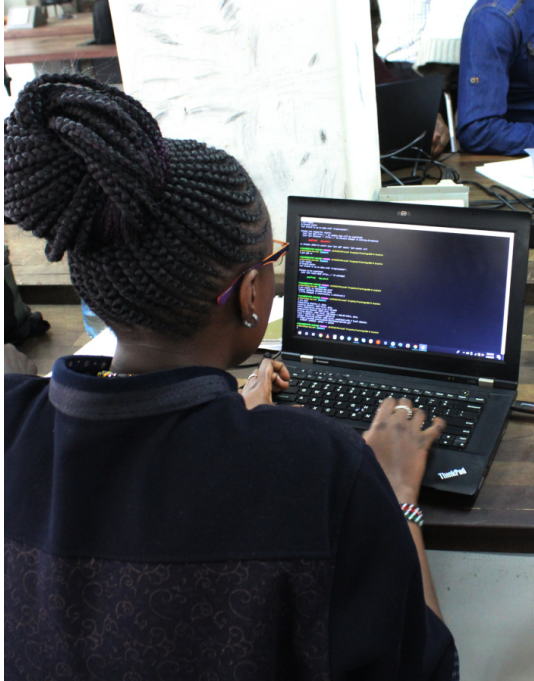


Der Kurs

Die Teilnehmer

- Warum R?
- Erwartung von dem Kurs

<https://board.net/p/rstats>





Einführung in R

Geschichte

- S (1975)
 - S-PLUS
 - TIBCO Spotfire S+
- R (1992)

R ist die kostenlose Alternative zu **S**

Ross Ihaka

Robert Gentleman





Einführung in R

Was ist R?

- Programmiersprache
 - Open Source (offene Quelle)
 - Freeware (kostenlos)
- Statistische Umgebung
 - Interface
 - Terminal
 - Editoren

<https://www.r-project.org/>



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The R Project for Statistical Computing

Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To [download R](#), please choose your preferred [CRAN mirror](#).

If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

News

- **R version 4.2.2 (Innocent and Trusting)** [prerelease versions](#) will appear starting Friday 2022-10-21. Final release is scheduled for Monday 2022-10-31.
- **R version 4.2.1 (Funny-Looking Kid)** has been released on 2022-06-23.
- **R version 4.1.3 (One Push-Up)** was released on 2022-03-10.
- Thanks to the organisers of useR! 2020 for a successful online conference. Recorded tutorials and talks from the conference are available on the [R Consortium YouTube channel](#).
- You can support the R Foundation with a renewable subscription as a [supporting member](#)

News via Twitter

 The R Foundation Retweeted



R Contributo... @R_Contributo... · Oct 10
 R Contribution Working Group meeting Oct 18, 18:30 - 19:30 UTC

We'll discuss progress on current issues (github.com/r-devel/rcontr), including

- Translation hackathons (LatinR, AsiaR)
- Office hours
- Code of conduct

All welcome. Zoom registration:
us02web.zoom.us/j/7829090833



Einführung in R

Was ist R?

- Statistisches Programmieren
 - Mathematik
 - Grafiken
- Kommandozeilen
- REPL (Read-Eval-Print-Schleife)

```
(5 + 100) * 25
```

```
[1] 2625
```

```
50/10
```

```
[1] 5
```

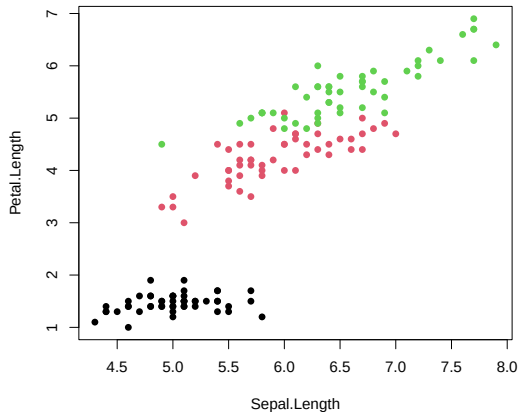
```
60 > 15
```

```
[1] TRUE
```




Einführung in R

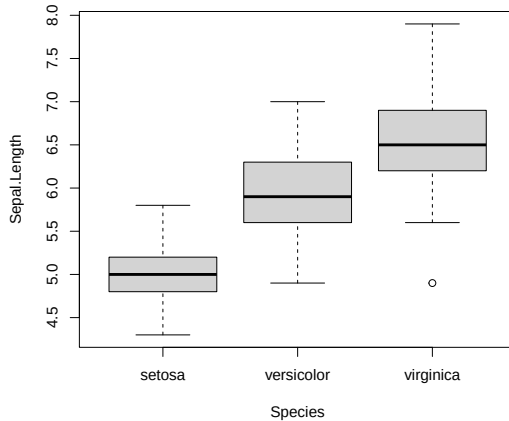
```
plot(Petal.Length ~ Sepal.Length,  
     pch = 16, col = Species,  
     data = iris)
```





Einführung in R

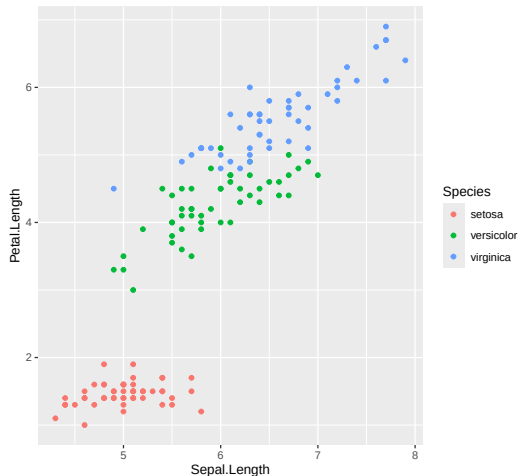
```
boxplot(Sepal.Length ~ Species,  
        data = iris)
```





Einführung in R

```
library(ggplot2)
ggplot(iris,
  aes(x = Sepal.Length,
      y = Petal.Length,
      color = Species)) +
  geom_point()
```





Einführung in R

Warum R?

- Kostet nichts
- Steuerung von Analysen
- Skripten
 - Protokolle
 - Reproduzierbarkeit
- Vielseitig

```
# Wir laden zunächst die Daten
```

```
data(iris)
```

```
# Wir berechnen die Mittelwerte für
```

```
# Länge und Breite von Petalen
```

```
# per Schwertlilienart
```

```
aggregate(cbind(Petal.Length, Petal.Width) ~ Species,  
           FUN = mean, data = iris)
```

	Species	Petal.Length	Petal.Width
1	setosa	1.462	0.246
2	versicolor	4.260	1.326
3	virginica	5.552	2.026



Einführung in R

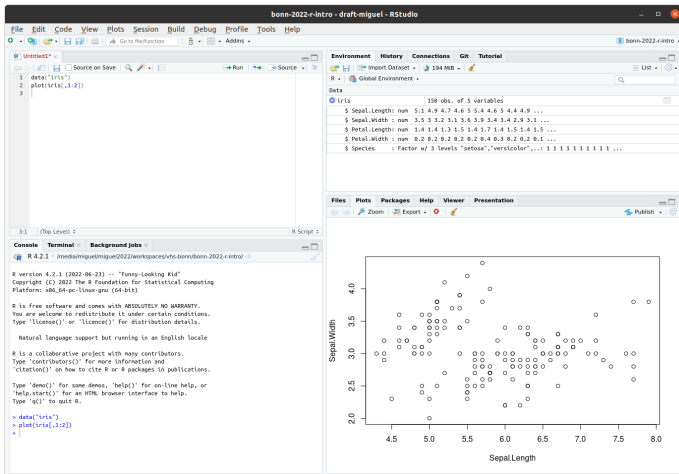
Wichtige Elemente

- Konsole
- Sitzung
- Workspace (Environment)
- Arbeitsverzeichnis (working directory)
- Skript
- Paket (Package)



RStudio

- Text Editor
- IDE (integrated development environment)





R als Taschenrechner

- Mathematische Operatoren
- Klammern

```
5+6*11
```

```
[1] 71
```

```
(5+6)*11
```

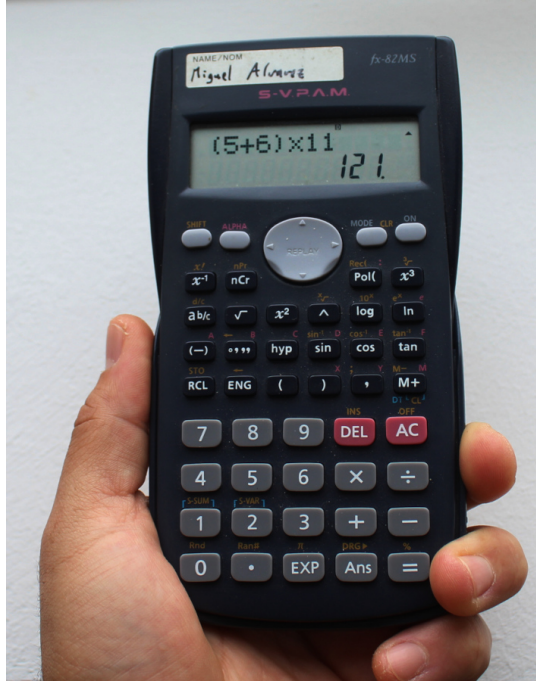
```
[1] 121
```

- Zuweisung <-

```
M <- 5
```

```
M + 2
```

```
[1] 7
```





Logische Operatoren

==

!=

>

>=

<

<=

&

|

%in%

!

any()

all()

```
10 > 15
```

```
[1] FALSE
```

```
10 < 15
```

```
[1] TRUE
```




Vielen Dank!

```
library(fortunes)
fortune(283)
```

The good way to do it is to include the following comment at the beginning:

```
# This is a holy Script, please edit it not
-- Kenn Konstabel (on "... how to protect R Script files from inadvertent
    editing by users.")
    R-help (April 2011)
```