

R: Grundkonzepte

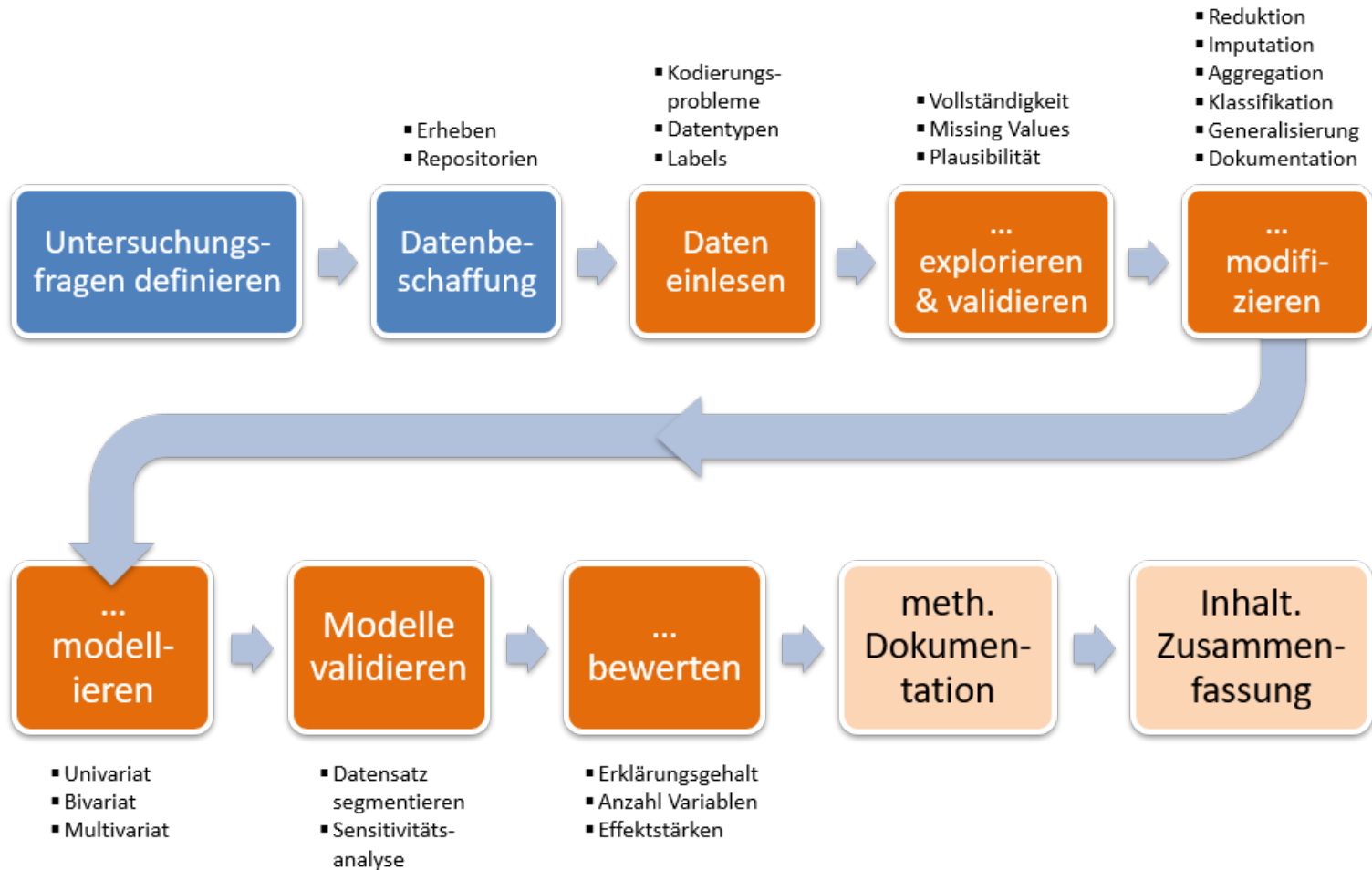
716408 | Sozialwiss. Methoden – How 2 do Things with Numbers

KMH
SS 22 (updated: 2022-05-04)



Wozu Statistikpakete?

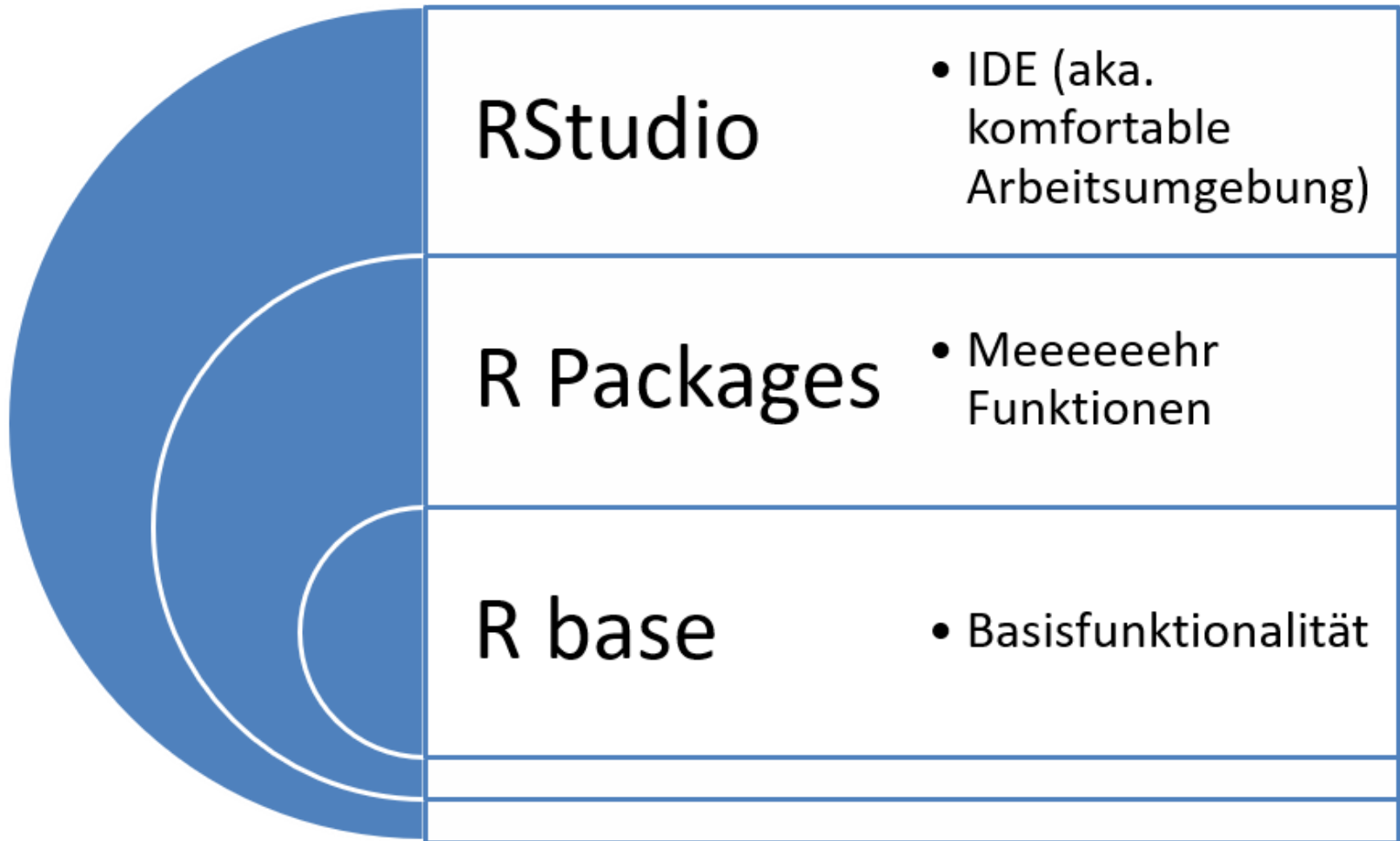
Ein idealtypischer Ablauf



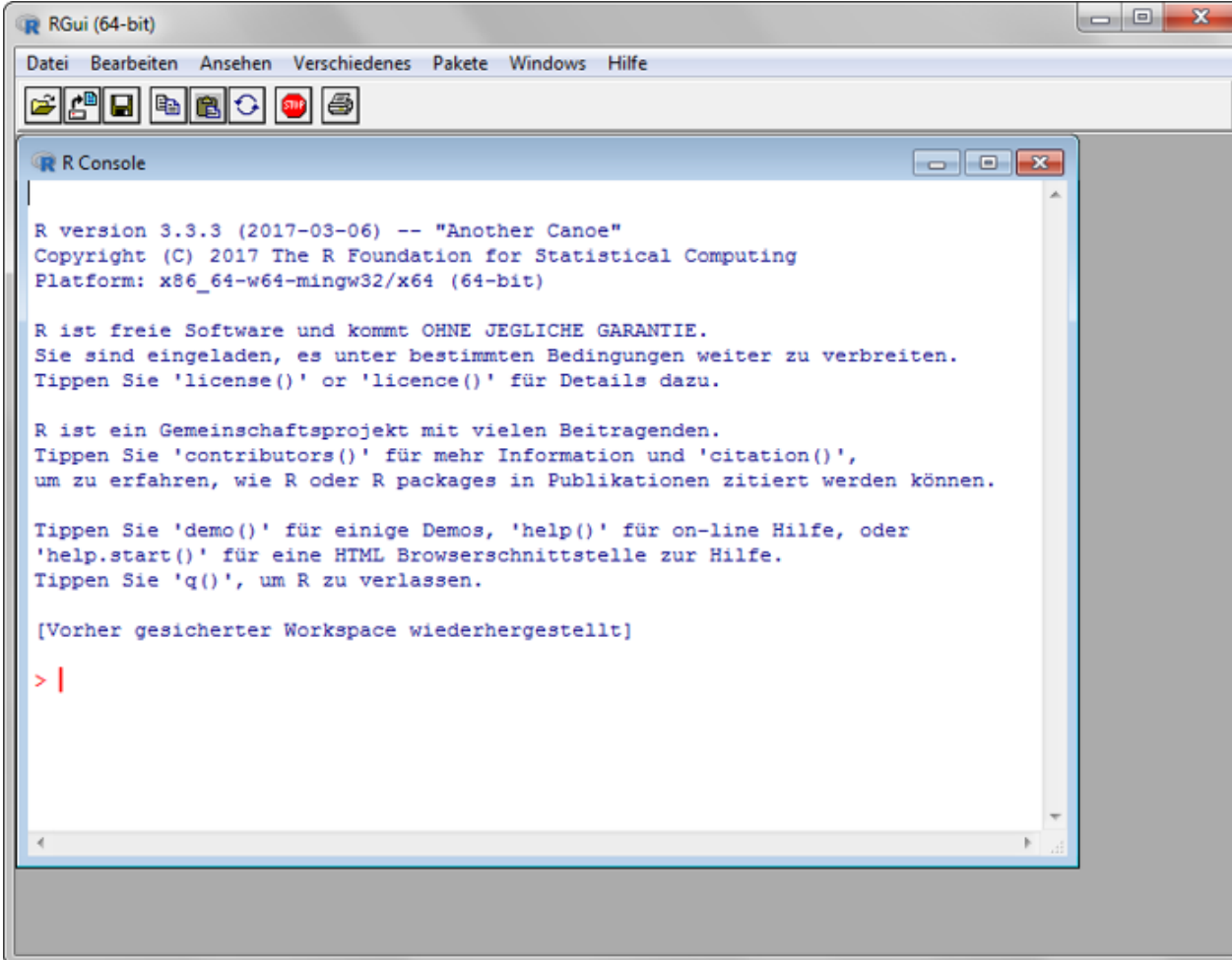


How to?

Base R, Packages & RStudio ... all you need



Der R-Interpreter (aka. „R-Console“)



The image shows a screenshot of the RGui (64-bit) window. The window title is "RGui (64-bit)". The menu bar includes "Datei", "Bearbeiten", "Ansehen", "Verschiedenes", "Pakete", "Windows", and "Hilfe". The toolbar contains icons for file operations and a red "STOP" button. The main area is a "R Console" window with the following text:

```
R version 3.3.3 (2017-03-06) -- "Another Canoe"  
Copyright (C) 2017 The R Foundation for Statistical Computing  
Platform: x86_64-w64-mingw32/x64 (64-bit)  
  
R ist freie Software und kommt OHNE JEGLICHE GARANTIE.  
Sie sind eingeladen, es unter bestimmten Bedingungen weiter zu verbreiten.  
Tippen Sie 'license()' or 'licence()' für Details dazu.  
  
R ist ein Gemeinschaftsprojekt mit vielen Beitragenden.  
Tippen Sie 'contributors()' für mehr Information und 'citation()',  
um zu erfahren, wie R oder R packages in Publikationen zitiert werden können.  
  
Tippen Sie 'demo()' für einige Demos, 'help()' für on-line Hilfe, oder  
'help.start()' für eine HTML Browserschnittstelle zur Hilfe.  
Tippen Sie 'q()', um R zu verlassen.  
  
[Vorher gesicherter Workspace wiederhergestellt]  
  
> |
```

Grundlegende arithmetische Operatoren in R

Operator	Description
+	addition
-	subtraction
*	multiplication
/	division
^ or **	exponentiation
x %% y	modulus (x mod y) 5%%2 is 1
x %/% y	integer division 5%/%2 is 2

Function	Description
abs(x)	absolute value
sqrt(x)	square root
ceiling(x)	ceiling(3.475) is 4
floor(x)	floor(3.475) is 3
trunc(x)	trunc(5.99) is 5
round(x, digits=n)	round(3.475, digits=2) is 3.48
signif(x, digits=n)	signif(3.475, digits=2) is 3.5
cos(x), sin(x), tan(x)	also acos(x), cosh(x), acosh(x), etc.
log(x)	natural logarithm
log10(x)	common logarithm
exp(x)	e^x

Grundlegende logische Operatoren in R

Operator	Description
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
==	exactly equal to
!=	not equal to
!x	Not x
x y	x OR y
x & y	x AND y
isTRUE(x)	test if X is TRUE

Grundlegende statistische Operatoren in R

Function	Description
mean (<i>x</i> , trim=0, na.rm=FALSE)	mean of object <i>x</i> # trimmed mean, removing any missing values and # 5 percent of highest and lowest scores <code>mx <- mean(x,trim=.05,na.rm=TRUE)</code>
sd (<i>x</i>)	standard deviation of object(<i>x</i>). also look at <code>var(x)</code> for variance and <code>mad(x)</code> for median absolute deviation.
median (<i>x</i>)	median
quantile (<i>x</i> , probs)	quantiles where <i>x</i> is the numeric vector whose quantiles are desired and <code>probs</code> is a numeric vector with probabilities in [0,1]. # 30th and 84th percentiles of <i>x</i> <code>y <- quantile(x, c(.3,.84))</code>
range (<i>x</i>)	range
sum (<i>x</i>)	sum
diff (<i>x</i> , lag= 1)	lagged differences, with lag indicating which lag to use
min (<i>x</i>)	minimum
max (<i>x</i>)	maximum
scale (<i>x</i> , center=TRUE, scale=TRUE)	column center or standardize a matrix.

Lost in R(?)



Eine Auswahl für Einsteigerinnen und Einsteiger:

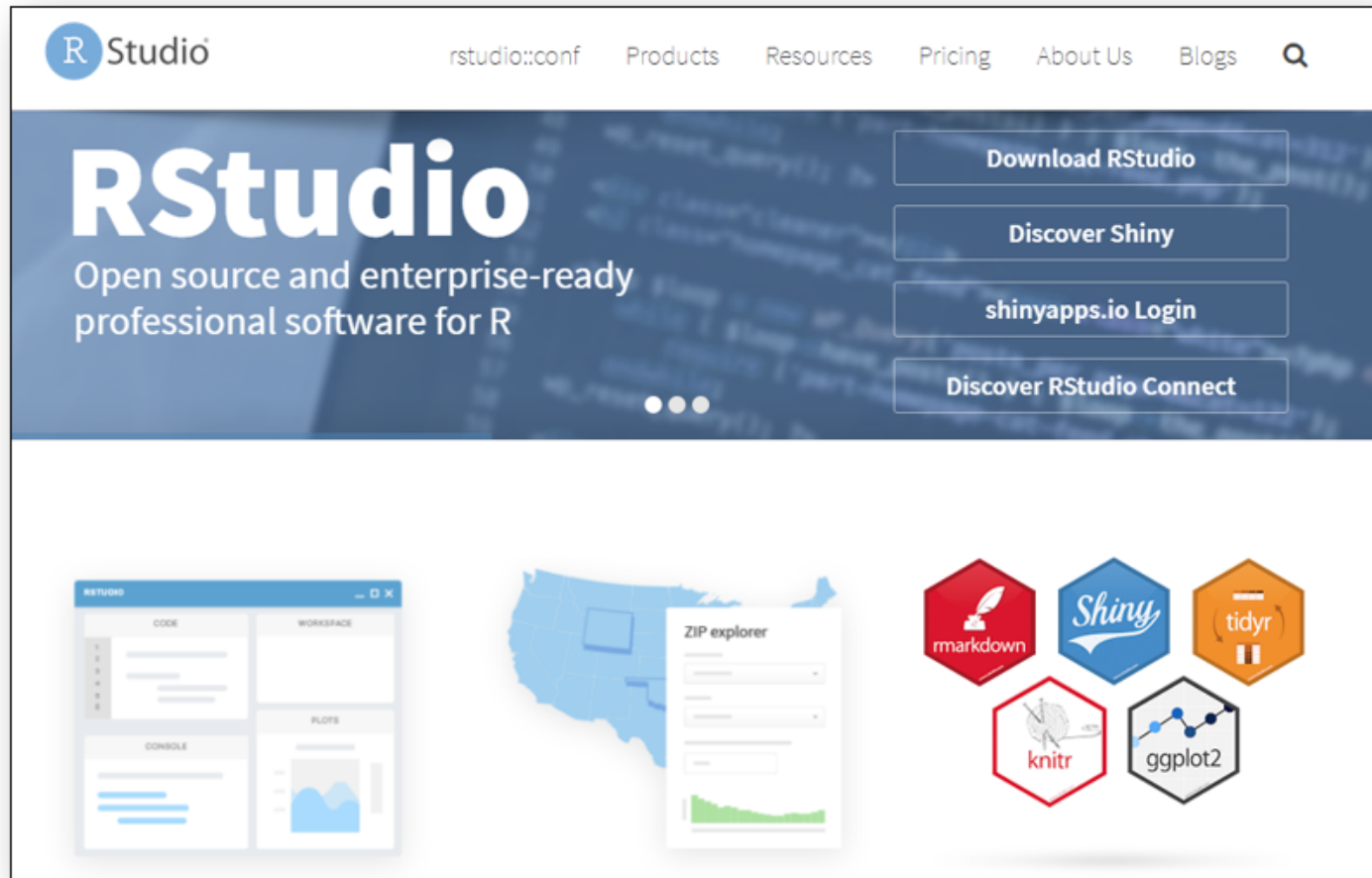
- <https://link.springer.com/book/10.1007/978-3-8348-9677-3>
- <https://www.statmethods.net/index.html>
- <https://www.uni-muenster.de/Stochastik/lehre/SS09/PrakStat/Skript.pdf>



Geht's auch einfacher?

Komfortabler: R Studio

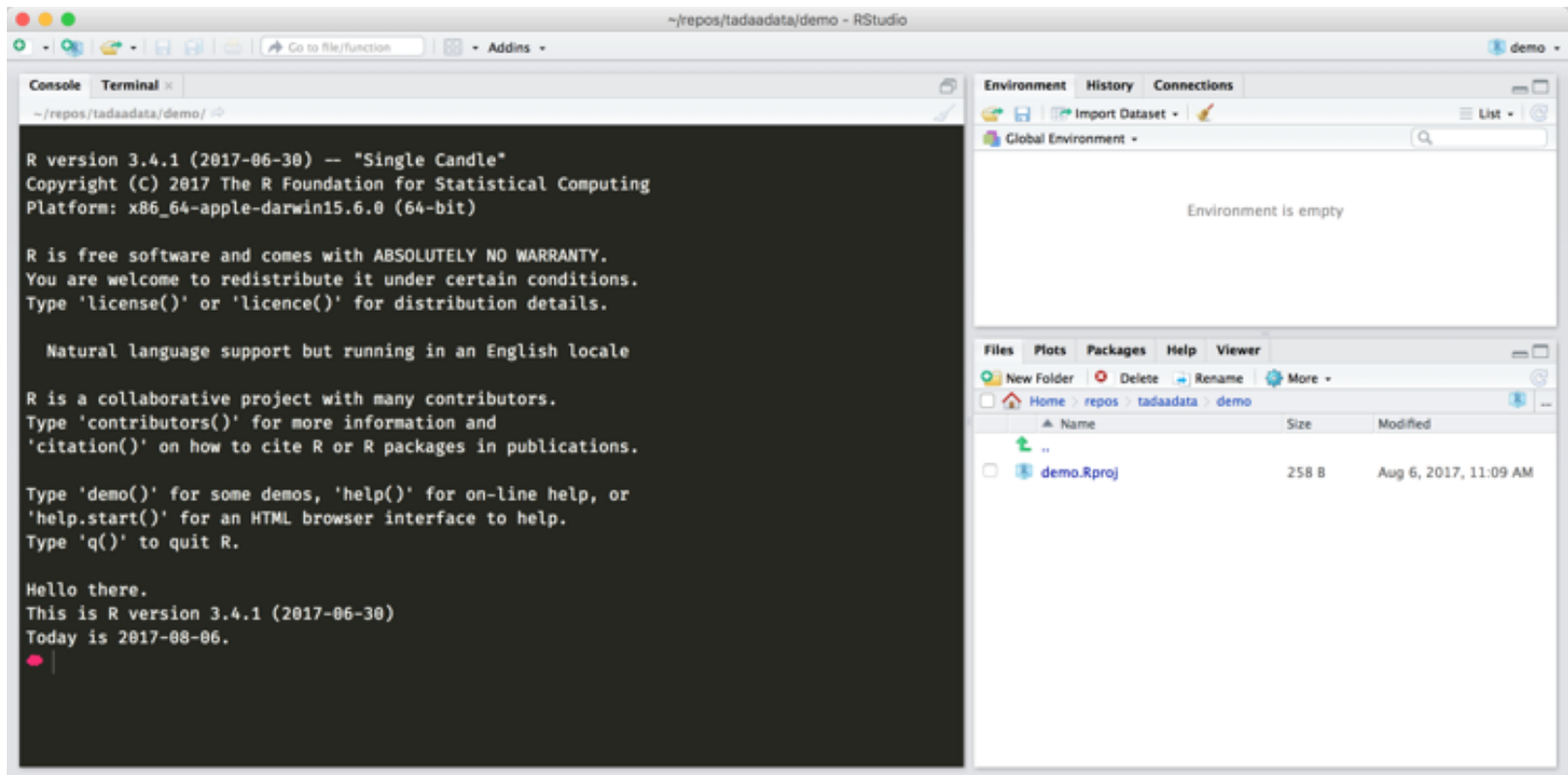
- <https://www.rstudio.com/>



The image shows the RStudio website homepage. At the top left is the RStudio logo. To its right is a navigation menu with links for 'rstudio::conf', 'Products', 'Resources', 'Pricing', 'About Us', 'Blogs', and a search icon. The main header features the large text 'RStudio' and the tagline 'Open source and enterprise-ready professional software for R'. Below this are four buttons: 'Download RStudio', 'Discover Shiny', 'shinyapps.io Login', and 'Discover RStudio Connect'. The lower section of the page contains three main visual elements: a screenshot of the RStudio IDE interface showing code, workspace, console, and plots; a map of the United States with a 'ZIP explorer' overlay; and a collection of five hexagonal icons representing related tools: rmarkdown, Shiny, tidy, knitr, and ggplot2.

Aufwärmrunde in RStudio

- **Kapitel „Orientierung“** im Kurs „R für Psychos“ von Lukas Burk & Tobias Anton: <https://r-intro.tadaa-data.de/book/orientierung.html>



The screenshot shows the RStudio interface. The console on the left displays the R startup message, including the version (3.4.1), copyright information, and a greeting. The Environment pane on the right shows that the environment is empty. The Files pane at the bottom right shows the current directory structure, including a file named 'demo.Rproj'.

```
R version 3.4.1 (2017-06-30) -- "Single Candle"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin15.6.0 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

Hello there.
This is R version 3.4.1 (2017-06-30)
Today is 2017-08-06.
█
```

Environment: Environment is empty

Name	Size	Modified
..		
demo.Rproj	258 B	Aug 6, 2017, 11:09 AM