

Biodiversity dynamics course

First steps with R Studio

Stephanie Kramer-Schadt



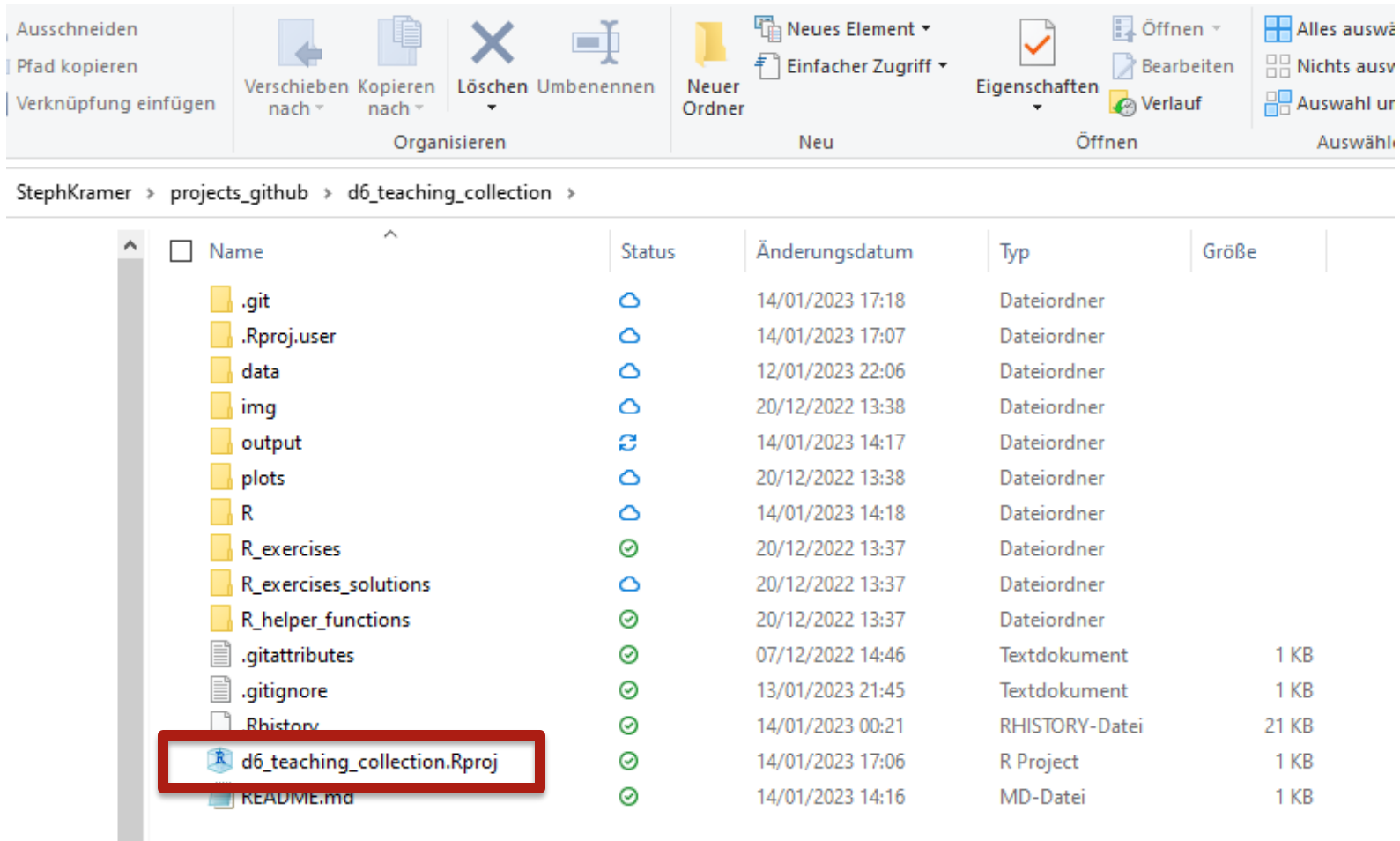
Leibniz Institute for Zoo
and Wildlife Research

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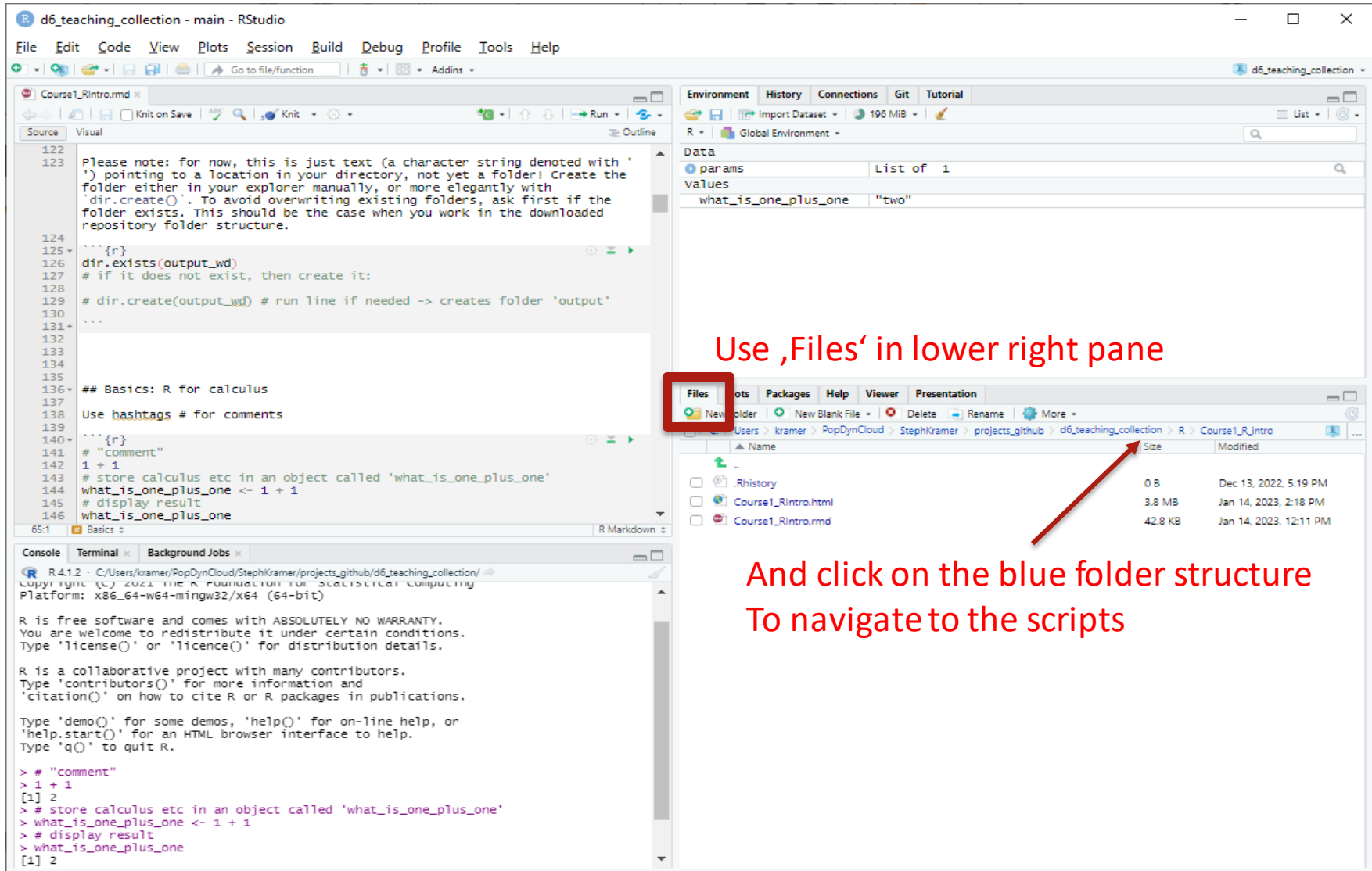
If you have downloaded the repository, double-click on the R-project to open it



The screenshot shows a Windows File Explorer window with the following ribbon tabs: Organisieren, Neu, Öffnen, and Auswahl. The address bar shows the path: StephKramer > projects_github > d6_teaching_collection >. The main pane displays a list of files and folders with columns for Name, Status, Änderungsdatum, Typ, and Größe. The file 'd6_teaching_collection.Rproj' is highlighted with a red box.

Name	Status	Änderungsdatum	Typ	Größe
.git	☁	14/01/2023 17:18	Dateiordner	
.Rproj.user	☁	14/01/2023 17:07	Dateiordner	
data	☁	12/01/2023 22:06	Dateiordner	
img	☁	20/12/2022 13:38	Dateiordner	
output	🔄	14/01/2023 14:17	Dateiordner	
plots	☁	20/12/2022 13:38	Dateiordner	
R	☁	14/01/2023 14:18	Dateiordner	
R_exercises	✅	20/12/2022 13:37	Dateiordner	
R_exercises_solutions	☁	20/12/2022 13:37	Dateiordner	
R_helper_functions	✅	20/12/2022 13:37	Dateiordner	
.gitattributes	✅	07/12/2022 14:46	Textdokument	1 KB
.gitignore	✅	13/01/2023 21:45	Textdokument	1 KB
Rhistory	✅	14/01/2023 00:21	RHISTORY-Datei	21 KB
d6_teaching_collection.Rproj	✅	14/01/2023 17:06	R Project	1 KB
README.md	✅	14/01/2023 14:16	MD-Datei	1 KB

R-project - open existing files



The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains R code for a project setup, including comments and a function to create an 'output' directory. The code includes:


```

122
123 Please note: for now, this is just text (a character string denoted with '
124 ') pointing to a location in your directory, not yet a folder! Create the
125 folder either in your explorer manually, or more elegantly with
126 dir.create(). To avoid overwriting existing folders, ask first if the
127 folder exists. This should be the case when you work in the downloaded
128 repository folder structure.
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136 ## Basics: R for calculus
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138 Use hashtags # for comments
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```
- Environment Pane:** Shows the current environment with a 'Data' section containing a 'params' list with one element: 'what_is_one_plus_one' with the value 'two'.
- Files Pane:** A red box highlights the 'Files' menu. A red arrow points to the folder structure in the file explorer, which shows the path: `C:\Users\kramer\PopDynCloud\StephKramer\projects_github> d6_teaching_collection > R > Course1_R_intro`. The file explorer lists:

Name	Size	Modified
..		
..Rhistory	0.8	Dec 13, 2022, 5:19 PM
Course1_Rintro.html	3.8 MB	Jan 14, 2023, 2:18 PM
Course1_Rintro.rmd	42.8 KB	Jan 14, 2023, 12:11 PM
- Console:** Shows the R prompt and the output of the script execution:

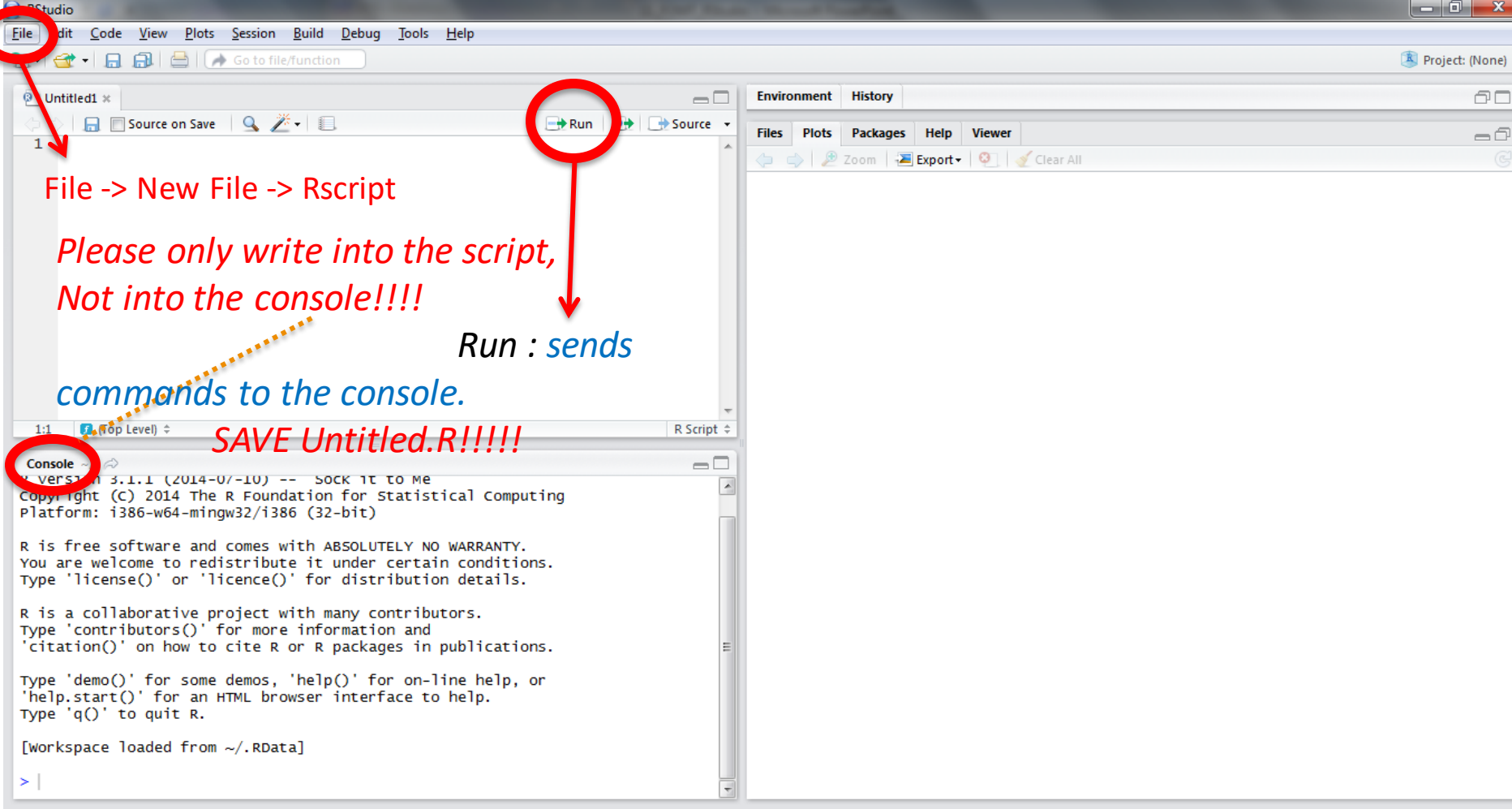

```

> # "comment"
> 1 + 1
[1] 2
> # store calculus etc in an object called 'what_is_one_plus_one'
> what_is_one_plus_one <- 1 + 1
> # display result
> what_is_one_plus_one
[1] 2

```

Red text annotations on the image state: "Use 'Files' in lower right pane" and "And click on the blue folder structure To navigate to the scripts".

creating your own R-script (independent of repository)



The screenshot shows the RStudio interface with several red annotations. A red circle highlights the 'File' menu in the top-left corner. A red arrow points from this circle to the text 'File -> New File -> Rscript'. Another red circle highlights the 'Run' button in the top toolbar, with a red arrow pointing to the text 'Run : sends commands to the console.'. A third red circle highlights the 'Console' window at the bottom, with a red arrow pointing to the text 'SAVE Untitled.R!!!!'. The console window displays the standard R startup message.

File -> New File -> Rscript

*Please only write into the script,
Not into the console!!!!*

Run : sends
commands to the console.

SAVE Untitled.R!!!!

```
RStudio
File Edit Code View Plots Session Build Debug Tools Help
Go to file/function
Project: (None)
Environment History
Files Plots Packages Help Viewer
Zoom Export Clear All
1:1 [Top Level] R Script
Console
R version 3.1.1 (2014-07-10) -- SOCK IT TO ME
Copyright (C) 2014 The R Foundation for Statistical Computing
Platform: i386-w64-mingw32/i386 (32-bit)

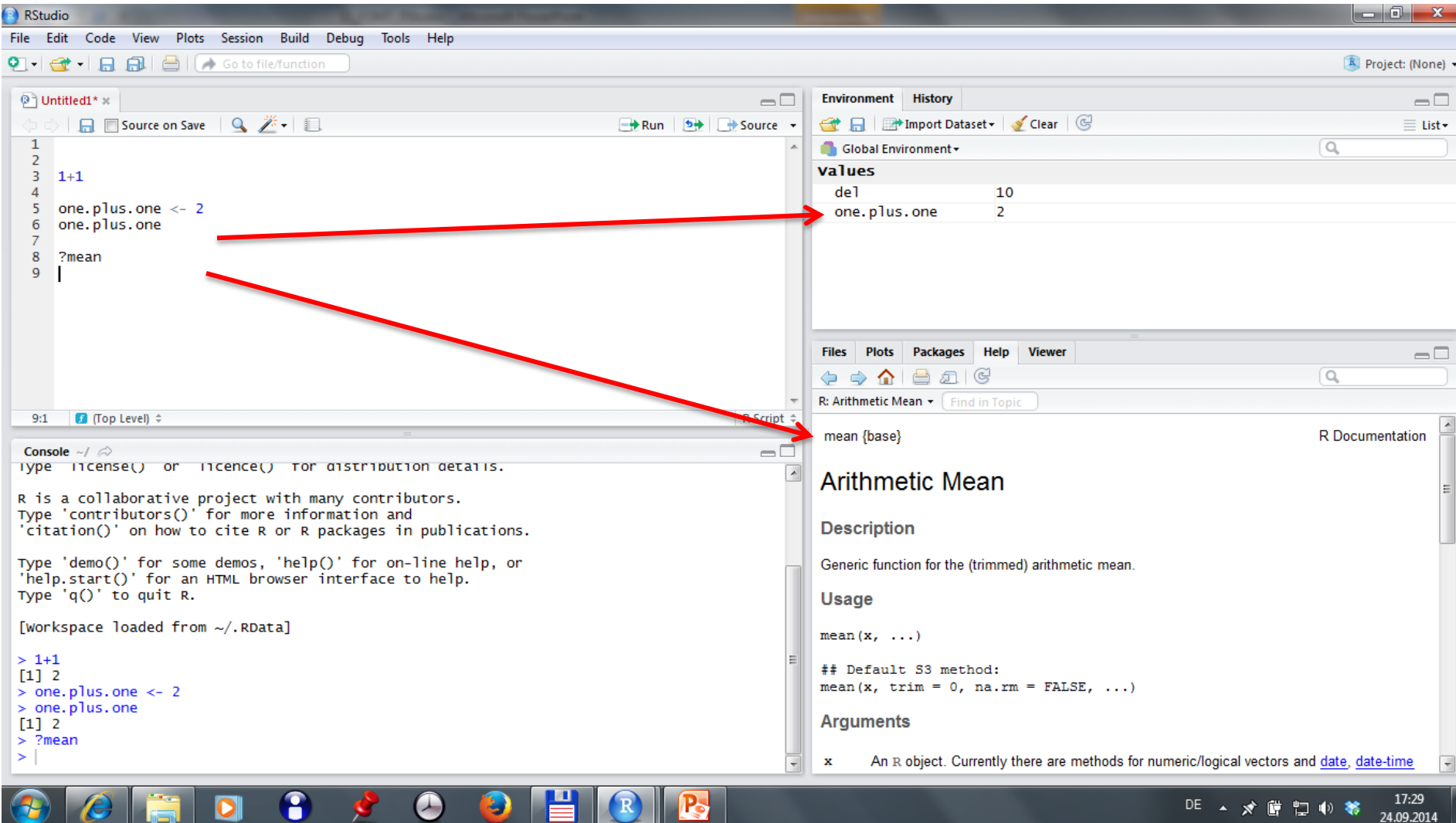
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

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.

[workspace loaded from ~/.RData]
> |
```

— Save the file ‘Untitled.R’ to e.g. <script1_yourname>.R’



The screenshot displays the RStudio environment with the following components:

- Source Editor:** Contains the following R code:

```
1  
2  
3 1+1  
4  
5 one.plus.one <- 2  
6 one.plus.one  
7  
8 ?mean  
9 |
```
- Environment:** Shows the Global Environment with the following values:

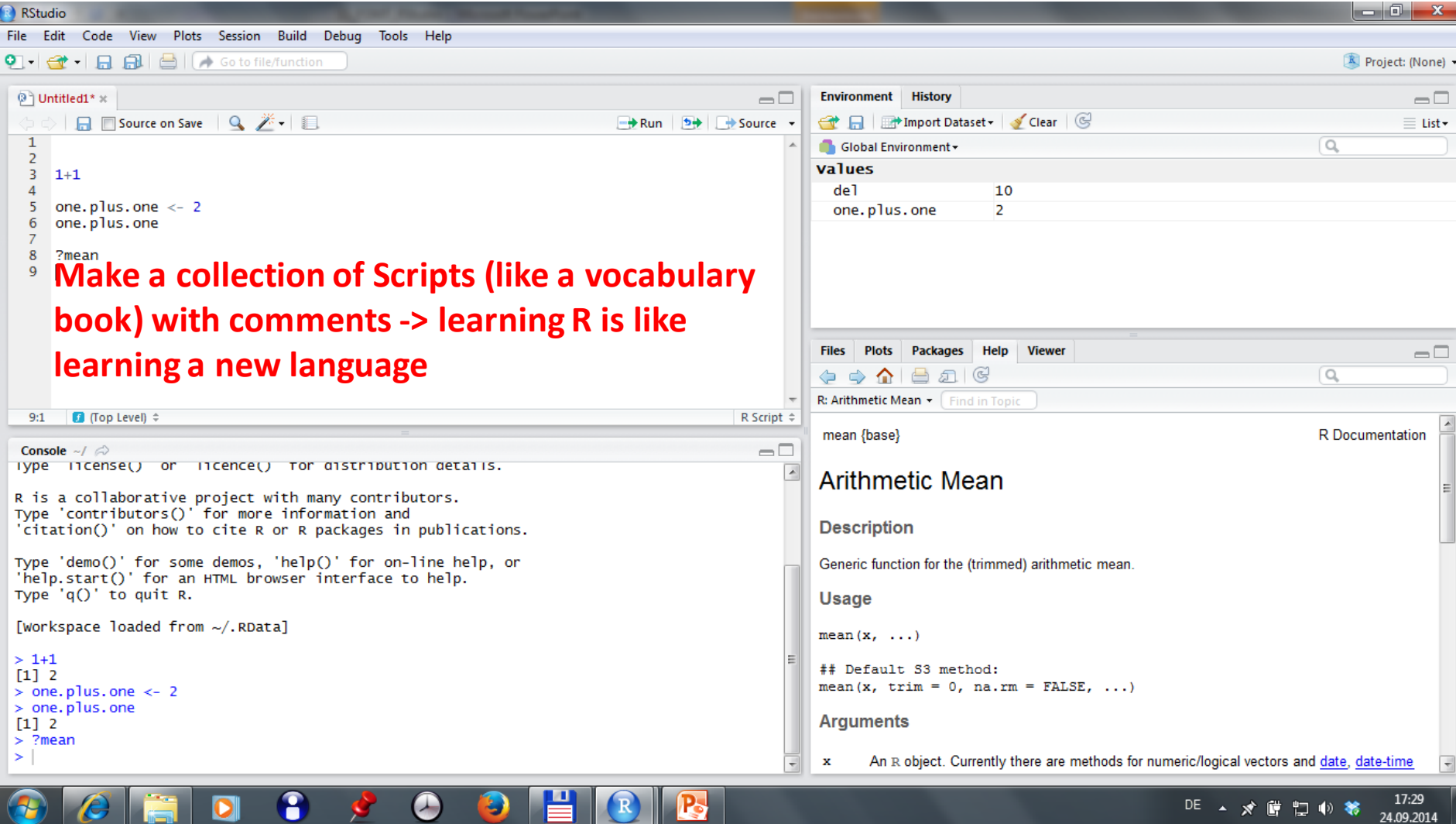
Variable	Value
de1	10
one.plus.one	2
- Console:** Shows the output of the code execution:

```
> 1+1  
[1] 2  
> one.plus.one <- 2  
> one.plus.one  
[1] 2  
> ?mean  
> |
```
- Viewer:** Displays the help page for the `mean` function, titled "Arithmetic Mean".

Red arrows indicate the flow of information: one arrow points from the assignment `one.plus.one <- 2` in the source editor to the `one.plus.one` entry in the Environment pane, and another arrow points from the `?mean` command in the source editor to the help page in the Viewer pane.

Comment your scripts

Make a collection of Scripts (like a vocabulary book) with comments -> learning R is like learning a new language



The screenshot displays the RStudio environment with the following components:

- Source Editor:** Contains an R script with the following code:

```
1  
2  
3 1+1  
4  
5 one.plus.one <- 2  
6 one.plus.one  
7  
8 ?mean  
9
```
- Console:** Shows the execution output:

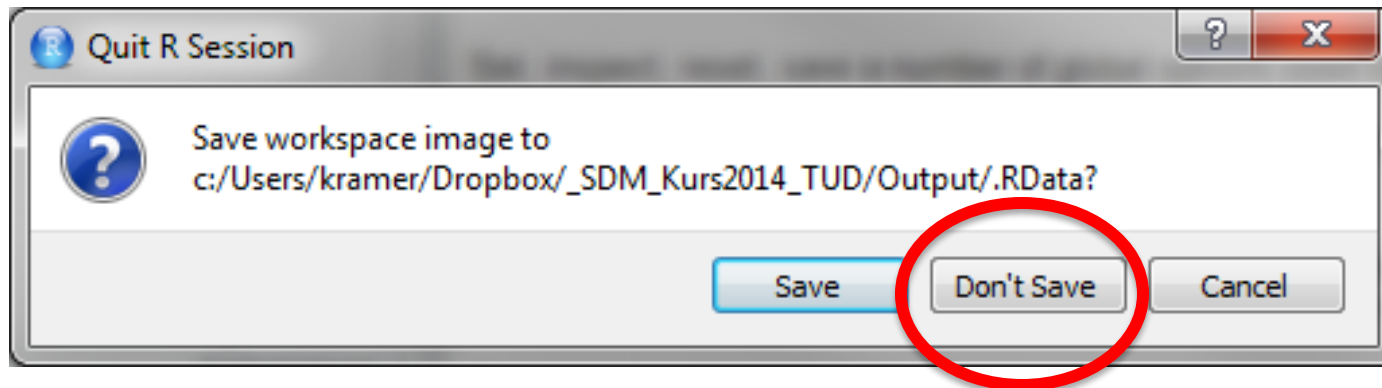
```
type 'license()' or 'licence()' for distribution details.  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
[workspace loaded from ~/.RData]  
  
> 1+1  
[1] 2  
> one.plus.one <- 2  
> one.plus.one  
[1] 2  
> ?mean  
> |
```
- Environment Pane:** Shows the current environment with the following values:

Variable	Value
de1	10
one.plus.one	2
- Help Viewer:** Displays the documentation for the `mean` function, including sections for Description, Usage, and Arguments.

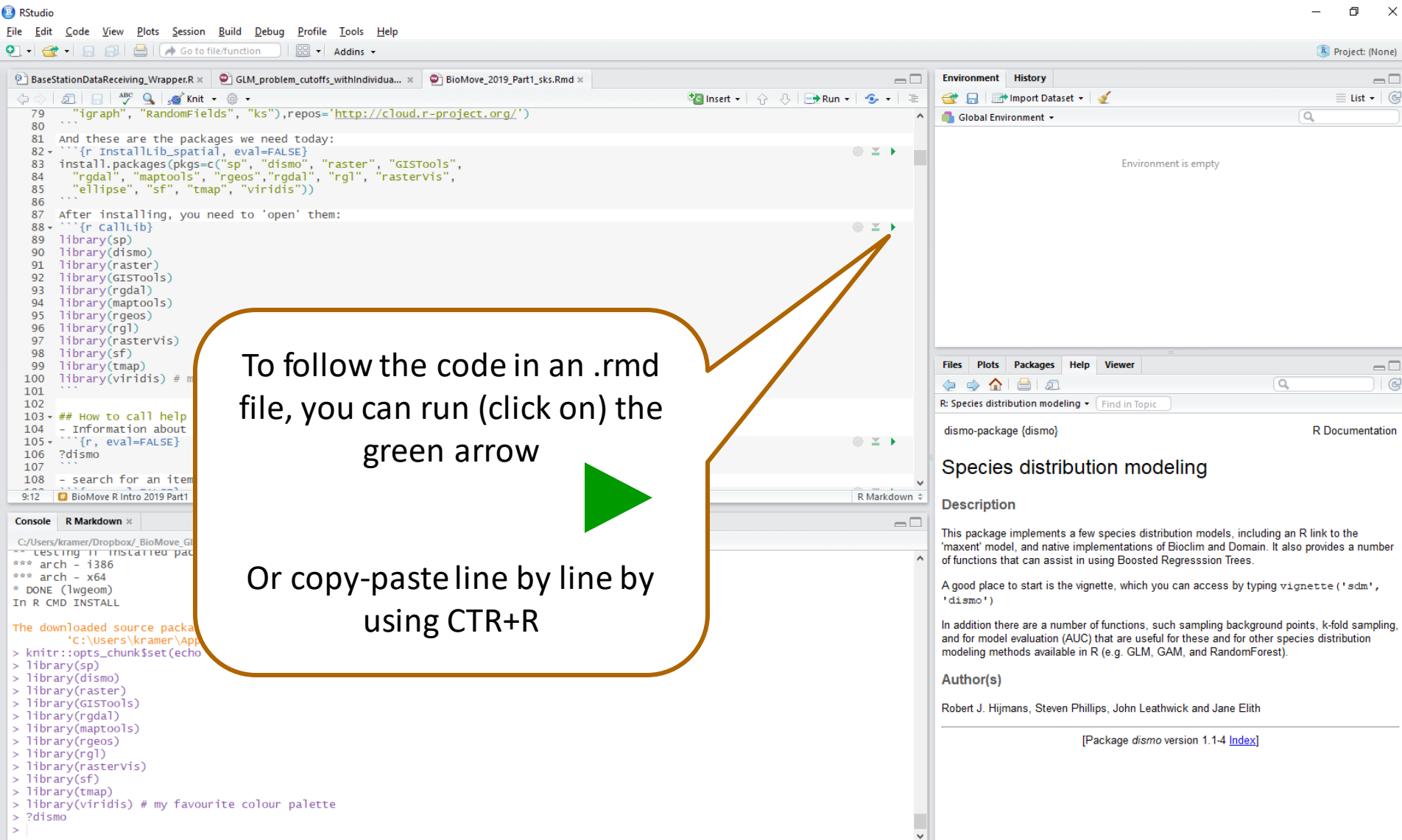
— If you close...

- Always always always **save** your Script!

- **Don't save** the R-workspace image



If you open .rmd files for the first time



To follow the code in an .rmd file, you can run (click on) the green arrow

Or copy-paste line by line by using CTR+R

```

79   "igraph", "RandomFields", "ks"), repos="http://cloud.r-project.org/")
80
81 And these are the packages we need today:
82 ```{r InstallLib_spatial, eval=FALSE}
83 install.packages(pkgs=c("sp", "dismo", "raster", "GISTools",
84   "rgdal", "maptools", "rgeos", "rgdal", "rgl", "rasterVis",
85   "ellipse", "sf", "tmap", "viridis"))
86
87 After installing, you need to 'open' them:
88 ```{r callLib}
89 library(sp)
90 library(dismo)
91 library(raster)
92 library(GISTools)
93 library(rgdal)
94 library(maptools)
95 library(rgeos)
96 library(rgl)
97 library(rasterVis)
98 library(sf)
99 library(tmap)
100 library(viridis) # my favourite colour palette
101
102
103 ## How to call help
104 - Information about
105 ```{r, eval=FALSE}
106 ?dismo
107
108 - search for an item
  
```

```

C:\Users\kramer\Dropbox\ BioMove.G
*** testing if installed packa
*** arch - i386
*** arch - x64
* DONE (lwgeom)
In R CMD INSTALL

The downloaded source packa
  'C:\Users\kramer\AppData
> knitr::opts_chunk$set(echo
> library(sp)
> library(dismo)
> library(raster)
> library(GISTools)
> library(rgdal)
> library(maptools)
> library(rgeos)
> library(rgl)
> library(rasterVis)
> library(sf)
> library(tmap)
> library(viridis) # my favourite colour palette
> ?dismo
>
  
```

Environment History

Global Environment

Environment is empty

Files Plots Packages Help Viewer

R: Species distribution modeling

dismo-package (dismo) R Documentation

Species distribution modeling

Description

This package implements a few species distribution models, including an R link to the 'maxent' model, and native implementations of Bioclim and Domain. It also provides a number of functions that can assist in using Boosted Regression Trees.

A good place to start is the vignette, which you can access by typing `vignette('sdm', 'dismo')`

In addition there are a number of functions, such as sampling background points, k-fold sampling, and for model evaluation (AUC) that are useful for these and for other species distribution modeling methods available in R (e.g. GLM, GAM, and RandomForest).

Author(s)

Robert J. Hijmans, Steven Phillips, John Leathwick and Jane Elith

[Package *dismo* version 1.1-4 [Index](#)]