

Installation Instructions for the Course “Data Preparation and Visual Analysis with R”

2 Day Workshop at Universität Luzern
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Overview

This guide will walk you through the following steps

1. Installing R
2. Installing RStudio
3. Installing the tidyverse set of Packages
4. Downloading the Course Materials

About R

R is an open-source software that is widely popular in academic research as it is open-source and available for free. It consists of “R” or Base R – the main installation files - as well as over 10'000 extension packages provided by the community (available for download from within R).

For a typical project, you will always have to install base R and a set of packages relevant for your particular research question. Here, we will mostly work with base R and the tidyverse, a set of packages aiming to “tidy up” the data preparation and facilitate visual analysis steps.

Base R only comes with a very basic command-line editor. Due to its clean interface and good performance, RStudio has for many users become the editor of choice. The standard version of the editor is open source and free-to-use.

Installing R

It is strongly recommended to install R before you install RStudio. RStudio will then detect the path to the R software automatically.

1. Go to <https://cran.r-project.org/> - the Comprehensive R Archive Network.
2. Right at the top you will find download links based on your computer's operating system:

The Comprehensive R Archive Network

Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- [Download R for Linux](#)
- [Download R for \(Mac\) OS X](#)
- [Download R for Windows](#)

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

3. Installation for Windows

4.1 Go to the "base" folder

R for Windows

Subdirectories:

base	Binaries for base distribution. This is what you want to install R for the first time .
contrib	Binaries of contributed CRAN packages (for R >= 2.13.x; managed by Uwe Ligges). There is also information on third party software available for CRAN Windows services and corresponding environment and make variables.
old contrib	Binaries of contributed CRAN packages for outdated versions of R (for R < 2.13.x; managed by Uwe Ligges).
Rtools	Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself.

Please do not submit binaries to CRAN. Package developers might want to contact Uwe Ligges directly in case of questions / suggestions related to Windows binaries.

You may also want to read the [R FAQ](#) and [R for Windows FAQ](#).

Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.

4.2 Download the most recent version

R-3.6.1 for Windows (32/64 bit)

[Download R 3.6.1 for Windows](#) (81 megabytes, 32/64 bit)

[Installation and other instructions](#)

[New features in this version](#)

If you want to double-check that the package you have downloaded matches the package distributed by CRAN, you can compare the [md5sum](#) of the .exe to the [fingerprint](#) on the master server. You will need a version of md5sum for windows: both [graphical](#) and [command line versions](#) are available.

4.3 Install R: Double click on the file you downloaded. You can leave all the options at their default value (or change the installation destination if you prefer). Setting any custom startup options is not necessary.

5. Installation for Mac

5.1 Download the latest release

Latest release:

[R-3.6.1.pkg](#)

MD5-hash: 279e6662103dfe6a625b4573143cb995
SHA1-hash: 4e932f8e5013870d2a9179b54eace277f41657b0
(ca. 76MB)

R 3.6.1 binary for OS X 10.11 (El Capitan) and higher, signed package. Contains R 3.6.1 framework, R.app GUI 1.70 in 64-bit for Intel Macs, Tcl/Tk 8.6.6 X11 libraries and Texinfo 5.2. The latter two components are optional and can be omitted when choosing "custom install", they are only needed if you want to use the `tcltk` R package or build package documentation from sources.

5.2 Install R: Double click on the file you downloaded. You can leave all the options at their default value (or change the installation destination if you prefer). Setting any custom startup options is not necessary.

6. Installation for Linux

6.1 Choose your Linux distribution

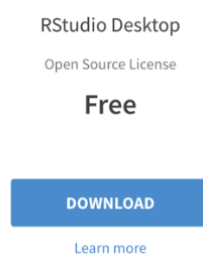
The Linux installation depends heavily on your Linux distribution. In-depth instructions are given for each distribution by the R team when you click the respective distribution folder.

Index of /bin/linux

Name	Last modified	Size	Description
 Parent Directory		-	
 debian/	2019-10-14 14:13	-	
 redhat/	2014-07-27 21:12	-	
 suse/	2012-02-16 15:09	-	
 ubuntu/	2019-10-25 03:08	-	

Installing RStudio

1. Go to <https://rstudio.com/products/rstudio/download/>
2. Download RStudio Desktop (Free)



3. Choose the correct installer based on your computer's operating system

Installers for Supported Platforms

Installers	Size	Date	MD5
RStudio 1.2.5019 - Ubuntu 18/Debian 10 (64-bit)	106.04 MB	2019-11-01	a6c9af3d8b1621eb155d23c879c1a75a
RStudio 1.2.5019 - Debian 9 (64-bit)	106.39 MB	2019-11-01	bc7b0b25b41e39fb6f1aefa74163a133
RStudio 1.2.5019 - Fedora 28/Red Hat 8 (64-bit)	120.89 MB	2019-11-01	2291b1befb02622b3aa02c43638ee5c2
RStudio 1.2.5019 - macOS 10.12+ (64-bit)	126.88 MB	2019-11-01	55738355277e8ec660e628acaf2a401b
RStudio 1.2.5019 - SLES/OpenSUSE 12 (64-bit)	99.04 MB	2019-11-01	3bcbf47f40944cc4a5ef4f6fb42319c1
RStudio 1.2.5019 - OpenSUSE 15 (64-bit)	107.09 MB	2019-11-01	29d07b198b7aac92356f8487911efbfa
RStudio 1.2.5019 - Fedora 19/Red Hat 7 (64-bit)	120.26 MB	2019-11-01	dab1cb5f0ed39f5bcf0c795e2938fa94
RStudio 1.2.5019 - Ubuntu 14/Debian 8 (64-bit)	96.93 MB	2019-11-01	f86811fce50b48850fed259d6ce7ef13
RStudio 1.2.5019 - Windows 10/8/7 (64-bit)	149.82 MB	2019-11-01	4d6521a9b89d70c3bf50414c8b6708f2
RStudio 1.2.5019 - Ubuntu 16 (64-bit)	104.91 MB	2019-11-01	67d5a2c255f2bc1a171c7e417853102c

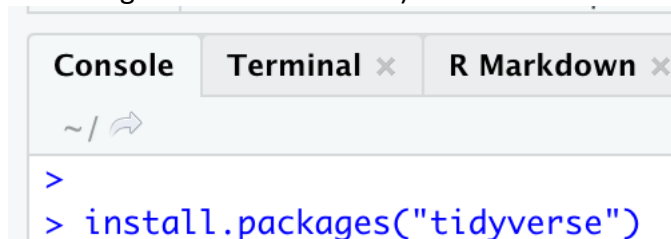
Should you still run a 32-bit operating system, you can find older installers here:

<https://support.rstudio.com/hc/en-us/articles/206569407-Older-Versions-of-RStudio>

4. Double click the installer and keep the default options (on Mac: drag the RStudio icon into the Applications folder).

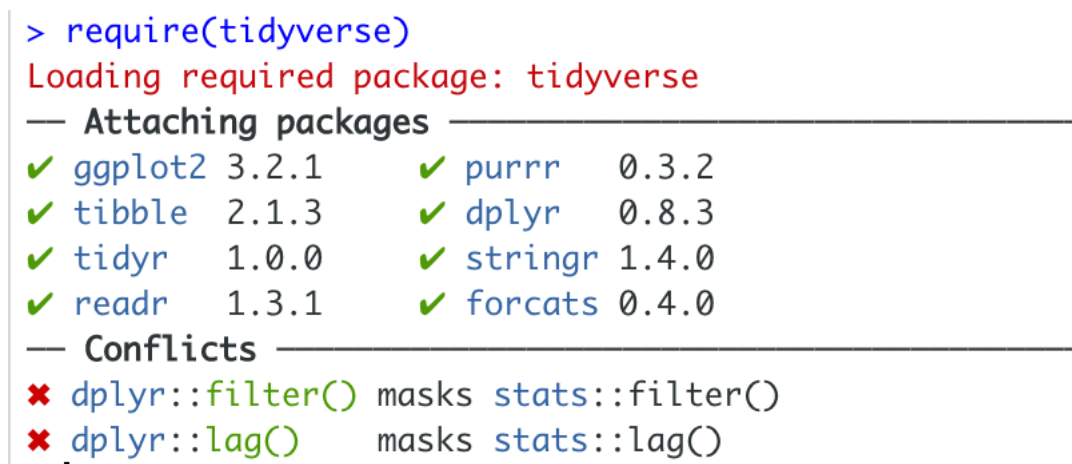
Install the tidyverse set of packages

1. Open R Studio
2. Type `install.packages("tidyverse")` into the console at the bottom left (you will need a working internet connection)



The screenshot shows the R Studio interface with three tabs: 'Console', 'Terminal', and 'R Markdown'. The 'Console' tab is active, showing a prompt character '>' followed by the command `install.packages("tidyverse")` entered in blue text.

3. Load the tidyverse



The screenshot shows the output of the `require(tidyverse)` command. It displays the loading of the required package, a list of attached packages with their versions, and a conflicts section.

```
> require(tidyverse)
Loading required package: tidyverse
— Attaching packages —
✓ ggplot2 3.2.1      ✓ purrr  0.3.2
✓ tibble  2.1.3      ✓ dplyr  0.8.3
✓ tidyr   1.0.0      ✓ stringr 1.4.0
✓ readr   1.3.1      ✓ forcats 0.4.0
— Conflicts —
✗ dplyr::filter() masks stats::filter()
✗ dplyr::lag()    masks stats::lag()
```

The conflicts section indicates, that some functions are available both in the tidyverse (`dplyr::filter()`) as well as in base R (`stats::filter()`). This is the standard behavior and the tidyverse will work fine.

Downloading the Course Materials

As not all students have access to UniLu's Moodle fileshare, the course material will be available here:

https://data-fittery.ch/downloads/R/2019_UniLu/

Please download the course data for day 1 before the course.