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old contrib	Binaries of contributed CRAN packages for outdated versions of R (for R 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: 4e932f8e5013870d2a9179b54eaee277f41657b0
(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 ommitted 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
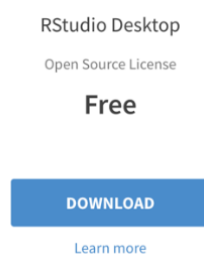
6.1 Choose your Linux distribution

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)

   RStudio Desktop

   Open Source License

   Free

   DOWNLOAD

   Learn more

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

   ## Installers for Supported Platforms

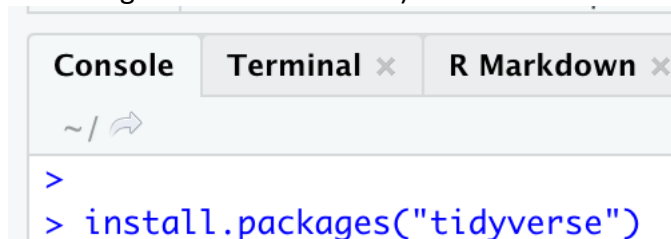 | Installers | Size | Date | MD5 |
   |---|---|---|---|
   | RStudio 1.2.5019 - Ubuntu 18/Debian 10 (64-bit) | 106.04 MB | 2019-11-01 | a6c9af3d8b1621eb155d23c879c1a75a |
   | RStudio 1.2.5019 - Debian 9 (64-bit) | 106.39 MB | 2019-11-01 | bc7b0b25b41e39fb6f1aefa74163a133 |
   | RStudio 1.2.5019 - Fedora 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: draw the RStudio icon into the Applications folder).
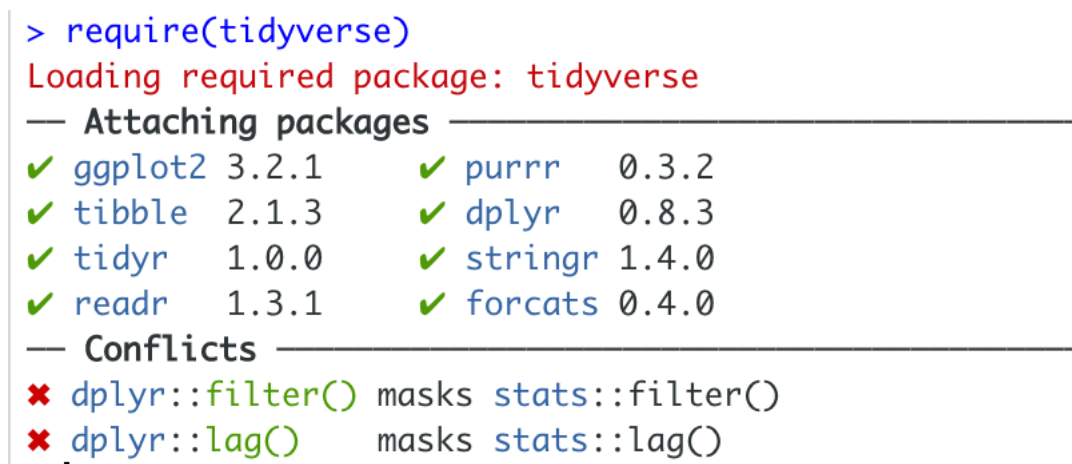
Install the tidyverse set of packages

1. Open R Studio

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

```
Console    Terminal ×    R Markdown ×

~/

>
> install.packages("tidyverse")
```

3. Load the tidyverse

```
> 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://github.com/febernd/2019_UniLu_R

Please download the course data for day 1 prior to the course.