Cluster analysis and its application in geochemistry -- A workshop at Goldschmidt 2020

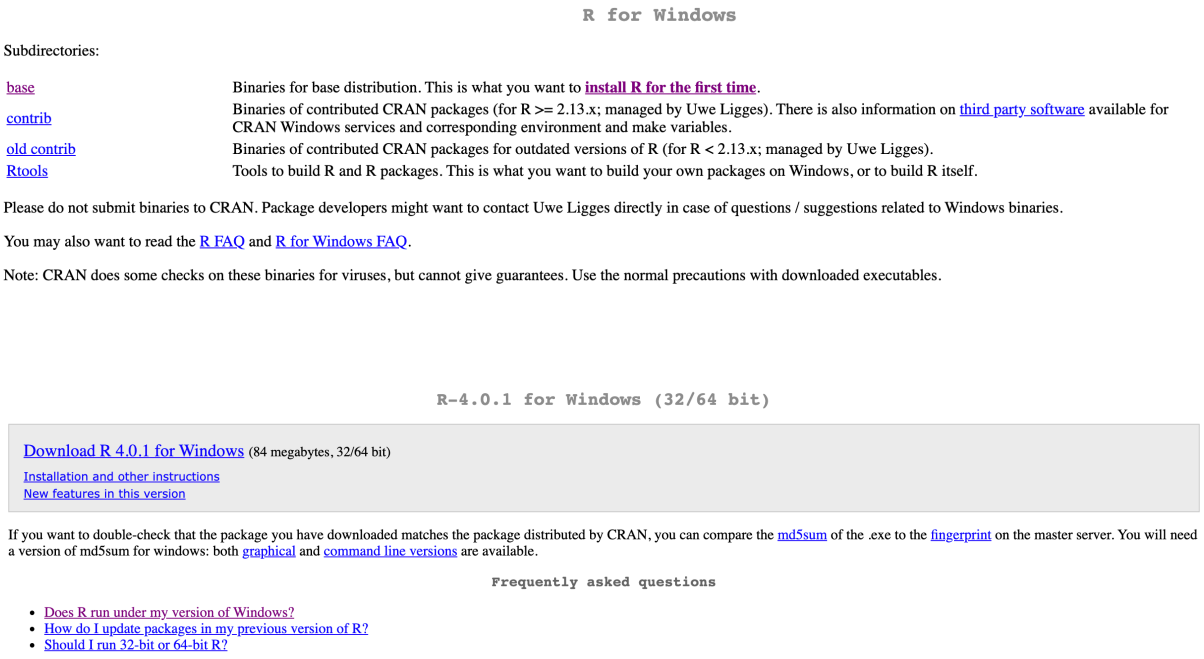
Step 1

1.1 Download R **first** from https://cran.r-project.org/

Note: if you already have R installed on your computer, just ignore this step. However, if you are not able to run the code of this workshop, your R might be very old. Consider updating R. This is a link showing you how to do the update (https://www.linkedin.com/pulse/3-methods-update-r-rstudio-windows-mac-woratana-ngarmtrakulchol)

Choose your system, download and install the latest R version (Linux needs to select the right distribution). My R version is 3.6.1. Therefore, if you choose to download and install the latest version, it will be newer than my version but it should work without any problem. The packages you install afterwards should be compatible with your own version.

For windows, click base and download the latest version as follows:



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old contrib	Binaries of contributed CRAN packages for outdated versions of R (for R 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.

R-4.0.1 for Windows (32/64 bit)

Download R 4.0.1 for Windows (84 megabytes, 32/64 bit)

Installation and other instructions

New features in this version

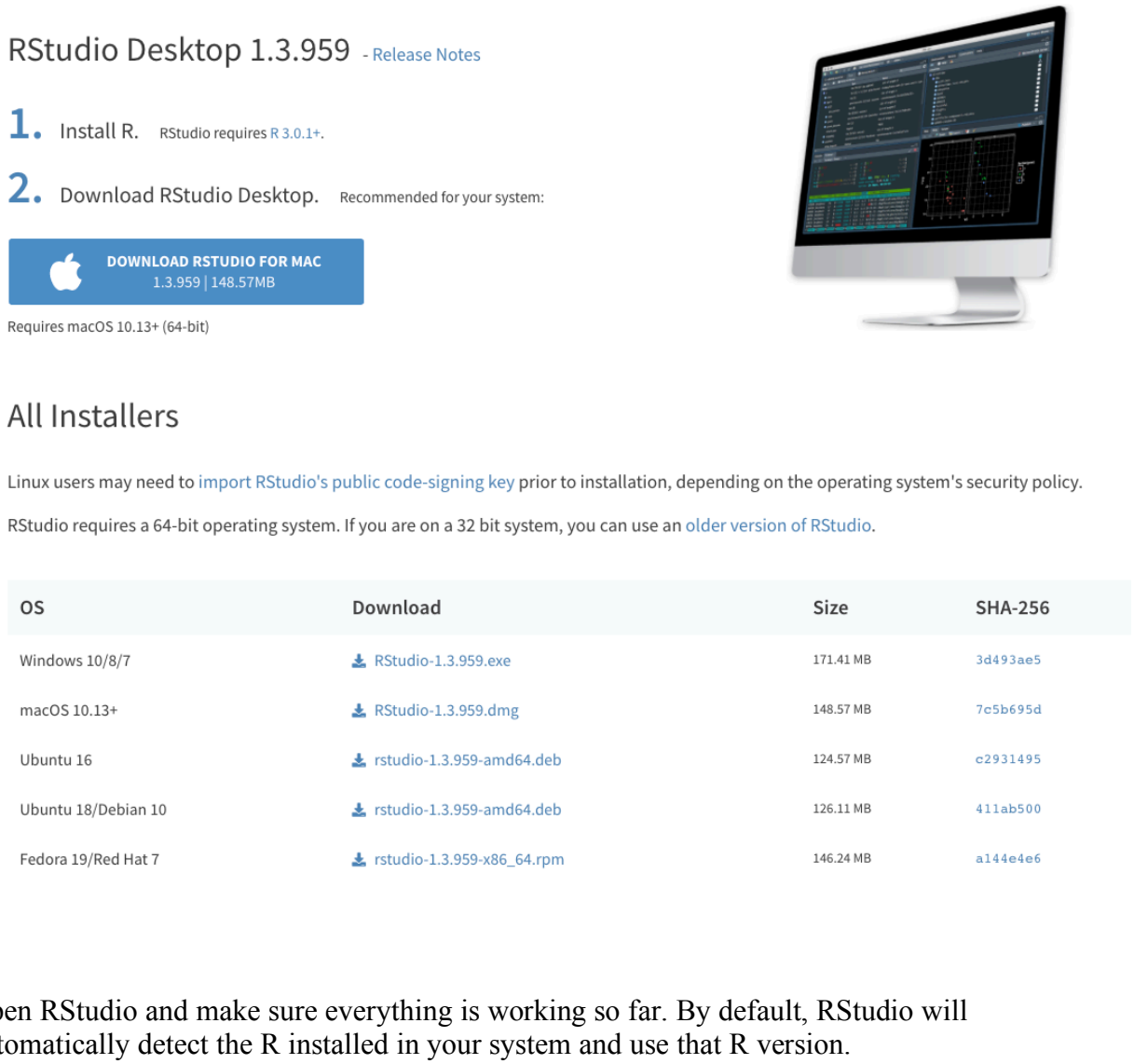
If you want to double-check that the package you have downloaded matches the package distributed by CRAN, you can compare the md5sum of the .exe to the fingerprint on the master server. You will need a version of md5sum for windows: both graphical and command line versions are available.

Frequently asked questions

- Does R run under my version of Windows?
- How do I update packages in my previous version of R?
- Should I run 32-bit or 64-bit R?

1.2 Download RStudio from https://rstudio.com/products/rstudio/download/#download

Still, choose the right system. The download button will most likely be shown on the website when you click this click, as this website can automatically detect your system and make the recommendation. If not, then just select the right version, download and install.



RStudio Desktop 1.3.959 - Release Notes

1. Install R. RStudio requires R 3.0.1+.

2. Download RStudio Desktop. Recommended for your system:

DOWNLOAD RSTUDIO FOR MAC
1.3.959 | 148.57MB

Requires macOS 10.13+ (64-bit)

All Installers

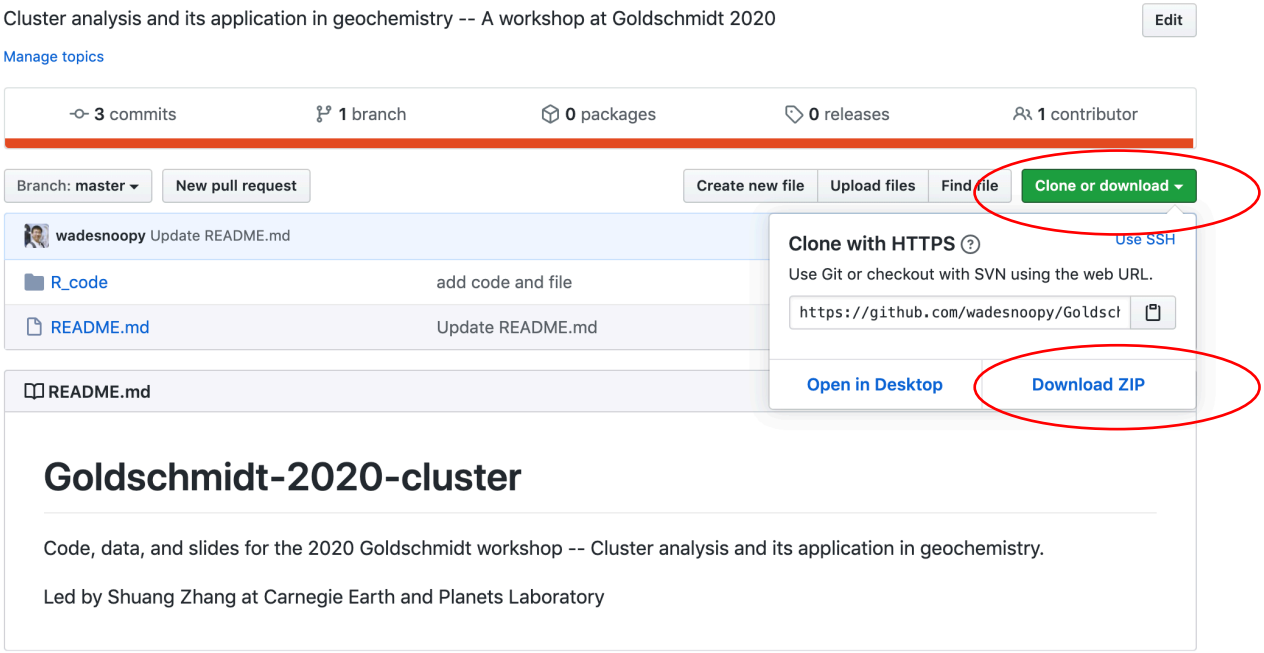
Linux users may need to import RStudio's public code-signing key prior to installation, depending on the operating system's security policy.

RStudio requires a 64-bit operating system. If you are on a 32 bit system, you can use an older version of RStudio.

OS	Download	Size	SHA-256
Windows 10/8/7	RStudio-1.3.959.exe	171.41 MB	3d493ae5
macOS 10.13+	RStudio-1.3.959.dmg	148.57 MB	7c5b695d
Ubuntu 16	rstudio-1.3.959-amd64.deb	124.57 MB	c2931495
Ubuntu 18/Debian 10	rstudio-1.3.959-amd64.deb	126.11 MB	411ab500
Fedora 19/Red Hat 7	rstudio-1.3.959-x86_64.rpm	146.24 MB	a144e4e6

Open RStudio and make sure everything is working so far. By default, RStudio will automatically detect the R installed in your system and use that R version.

Step 2: Download the ZIP file (more straightforward way) that contains the code, data and slides from https://github.com/wadesnoopy/Goldschmidt-2020-cluster



Step 3: Put the ZIP file in your working folder and unzip it. The unzipped folder name will be "Goldschmidt-2020-cluster-master"

Step 4: Navigate into the folder of "R_code". In this folder, you will see four files.

- "pyrite_samples.csv" is the data
- "Goldschmidt-2020-cluster.Rmd" (this is a markdown file) is the code that generates the static "Goldschmidt-2020-cluster.html" file.
- "Goldschmidt-2020-cluster.html" is the static HTML file generated by "Goldschmidt-2020-cluster.Rmd"
- "Goldschmidt-2020-cluster.R" is the code similar to "Goldschmidt-2020-cluster.Rmd"

Open "Goldschmidt-2020-cluster.html" to see the code output.

Step 5-1: Run the code (option 1). If you want to generate the "Goldschmidt-2020-cluster.html" file yourself, open the "Goldschmidt-2020-cluster.Rmd" in RStudio, set the path of your working folder following the instruction in the code, save the file, click "Knit" on the top panel, and then click "Knit to HTML", wait for ~2 to ~8 minutes (depending on your computer configuration), and a HTML file will be generated.

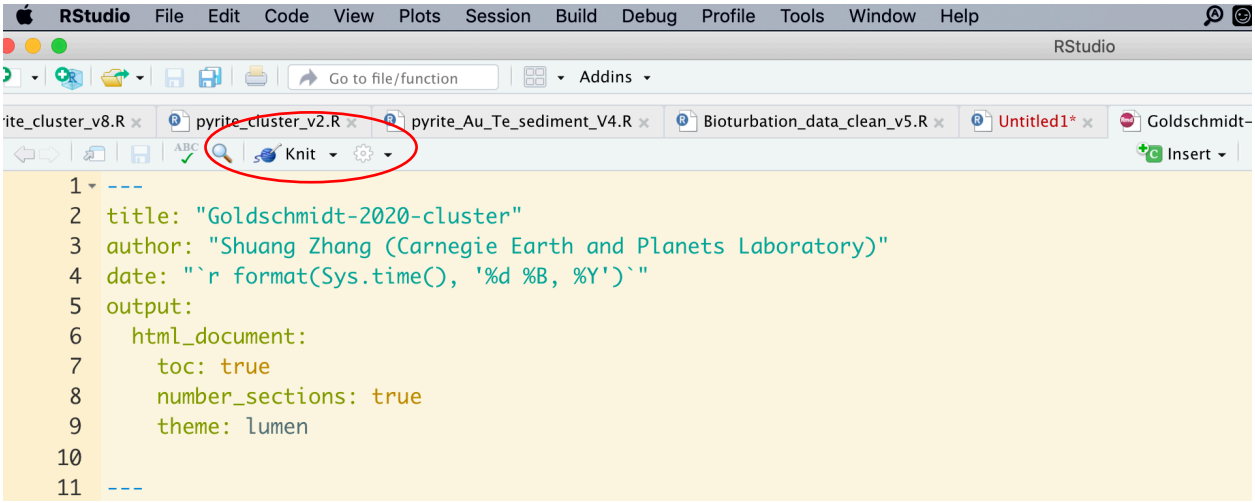
The path that needs to be set and the "Knit" button are shown below.

set the path

```
# change "/Users/shzhang/Documents/Research/Meeting/2020-Goldschmidt/R_code" to your own local path of the
R_code folder downloaded from github or from this workshop

setwd("/Users/shzhang/Documents/Research/Meeting/2020-Goldschmidt/R_code")
```

Knit the file



Step 5-2: Run the code (option 2). You can also open "Goldschmidt-2020-cluster.R" in RStudio and run the code chunk by chunk. This "Goldschmidt-2020-cluster.R" is an R file of the markdown file "Goldschmidt-2020-cluster.Rmd". Their contents are the same.