

# Introduction to

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WEEK 1, LAB, FALL 2019

# Get software ready

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- Most school computers should have R and Rstudio.
- If you use a personal computer (Windows or Mac), finish R and RStudio installation.

# Install R from CRAN

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- <https://cran.r-project.org/> (google: R CRAN)
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## 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.

### Source Code for all Platforms

Windows and Mac users most likely want to download the precompiled binaries listed in the upper box, not the source code. The sources have to be compiled before you can use them. If you do not know what this means, you probably do not want to do it!

- The latest release (2019-07-05, Action of the Toes) [R-3.6.1.tar.gz](#), read [what's new](#) in the latest version.

# R for Windows

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## 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  $\geq$  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Binaries of contributed CRAN packages for outdated versions of R (for R 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).

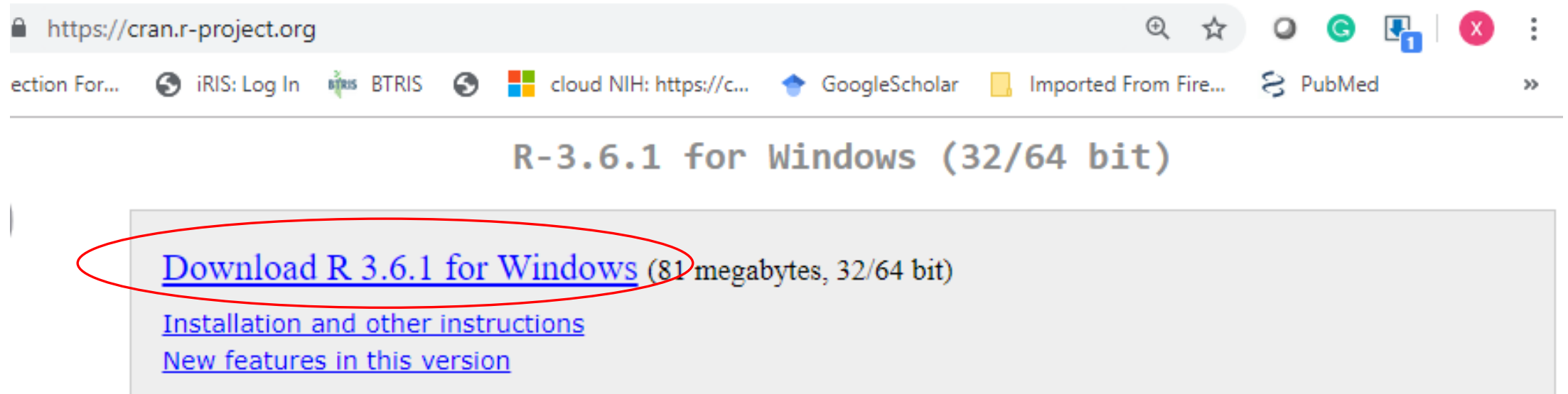
[Rtools](#)

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](#).

# Download and Install (accept default)



The screenshot shows the CRAN website with the URL <https://cran.r-project.org> in the address bar. The browser's bookmark bar is visible with links to 'iRIS: Log In', 'BTRIS', 'cloud NIH: https://c...', 'GoogleScholar', 'Imported From Fire...', and 'PubMed'. The main heading on the page is 'R-3.6.1 for Windows (32/64 bit)'. Below this, a grey box contains three links: 'Download R 3.6.1 for Windows (81 megabytes, 32/64 bit)', 'Installation and other instructions', and 'New features in this version'. The first link is circled in red.

<https://cran.r-project.org>

action For... iRIS: Log In BTRIS cloud NIH: https://c... GoogleScholar Imported From Fire... PubMed

## 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.

# R for MAC

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## Latest release:

[R-3.6.1.pkg](#)

MD5-hash: 279e6662103dfe6a625b4573143cb995

SHA1-

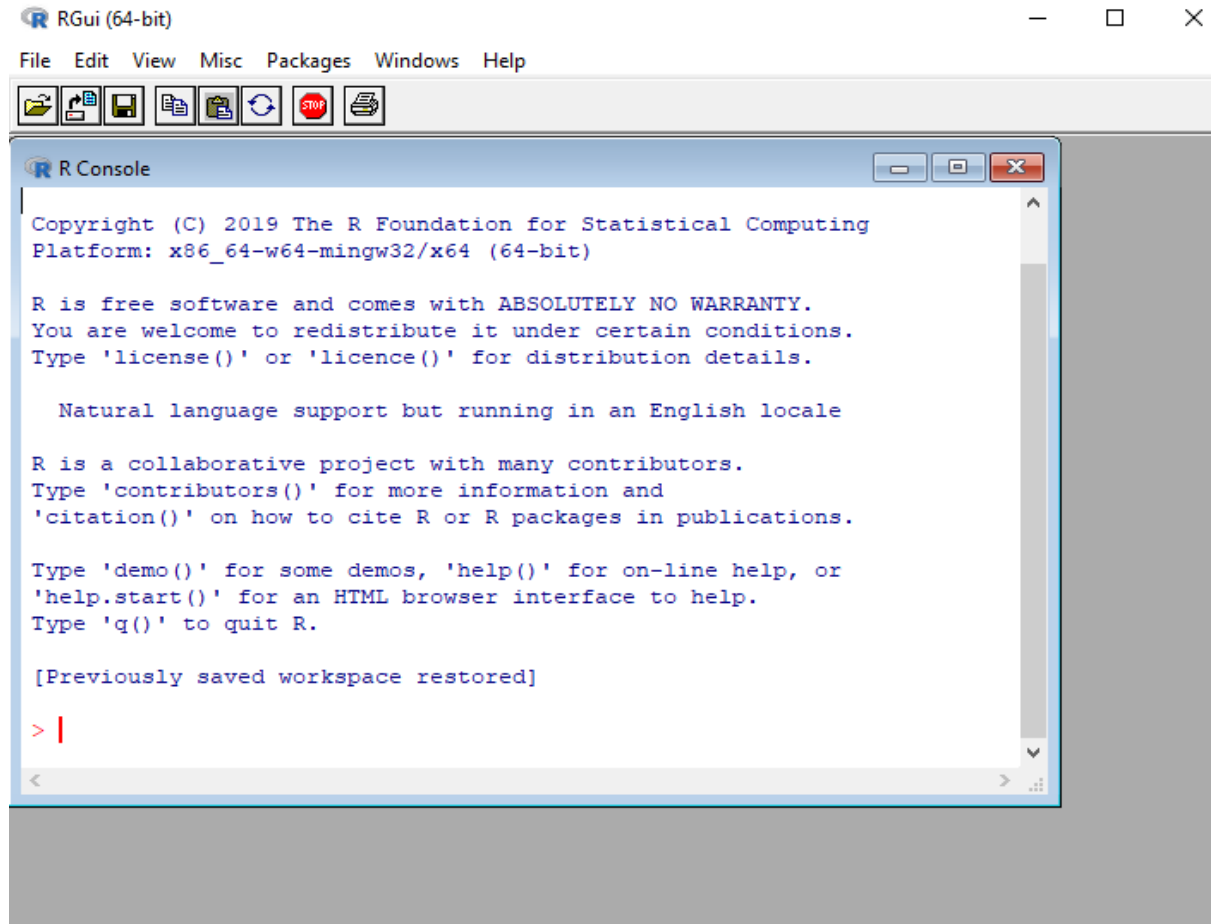
hash: 4e932f8e5013870d2a9179b54eaae277f41657b0  
(ca. 76MB)

**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.

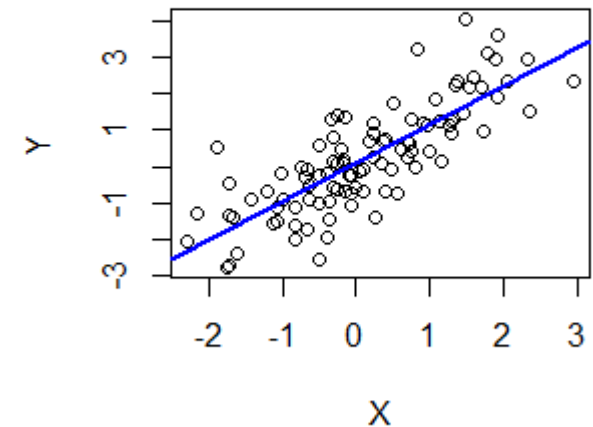
Note: the use of X11 (including `tcltk`) requires [XQuartz](#) to be installed since it is no longer part of OS X. Always re-install XQuartz when upgrading your macOS to a new major version.

**Important:** this release uses Clang 7.0.0 and GNU Fortran 6.1, neither of which is supplied by Apple. If you wish to compile R packages from sources, you will need to download and install those tools - see the [tools](#) directory.

# RGui Windows



- Demo R Windows
- File → new script
- `X <- rnorm(100)`
- `Y <- rnorm(100)+X`
- `plot(X,Y)`
- `abline(lsfith(X,Y), col=4, lwd=2)`



# Install RStudio



- **RStudio** is an integrated development environment (**IDE**)
- <https://www.rstudio.com/products/rstudio/download/> (Google Rstudio download)

RStudio Desktop Open Source License	RStudio Desktop Commercial License	RStudio Server Open Source License	RStudio Server Pro Commercial License
FREE	\$995 per year	FREE	\$4,975 per year (5 Named Users)
<a href="#">DOWNLOAD</a>	<a href="#">BUY</a>	<a href="#">DOWNLOAD</a>	<a href="#">BUY</a>
<a href="#">Learn More</a>	<a href="#">Learn More</a>	<a href="#">Learn More</a>	<a href="#">Evaluation</a>   <a href="#">Learn More</a>

Integrated Tools for R





# Download and Install (accept default)

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## **RStudio Desktop 1.2.1335** — [Release Notes](#)

RStudio requires R 3.0.1+. If you don't already have R, download it [here](#).

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

RStudio 1.2 requires a 64-bit operating system, and works exclusively with the 64 bit version of R. If you are on a 32 bit system or need the 32 bit version of R, you can use an [older version of RStudio](#).

## **Installers for Supported Platforms**

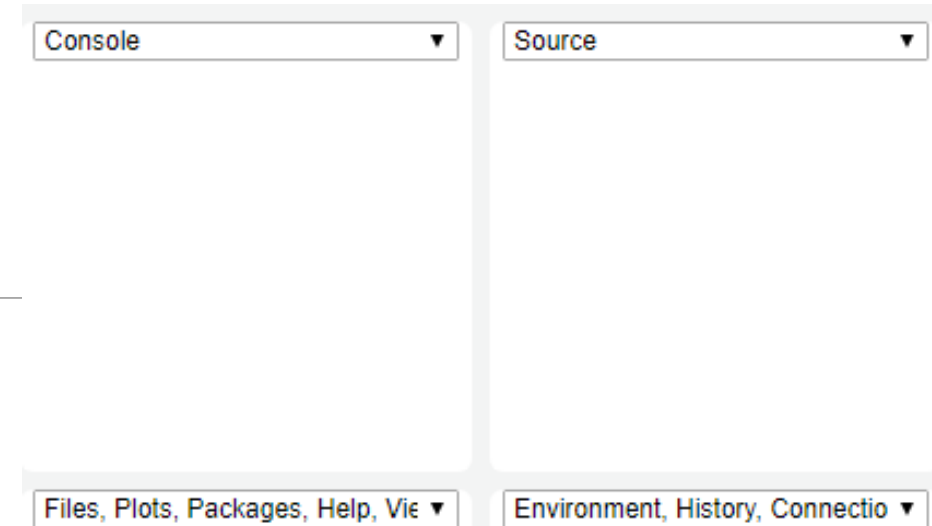
Installers	Size	Date	MD5
<a href="#">RStudio 1.2.1335 - Windows 7+ (64-bit)</a>	126.9 MB	2019-04-08	<a href="#">d0e2470f1f8ef4cd35a669aa323a2136</a>
<a href="#">RStudio 1.2.1335 - macOS 10.12+ (64-bit)</a>	121.1 MB	2019-04-08	<a href="#">6c570b0e2144583f7c48c284ce299eef</a>



# Open RStudio

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- Understand various windows
- Console, Source (scripts), file/Plots/help/.., Environment/..
- Open new files from templates, eg. Rmarkdown
- Demonstrate basic examples for data summary



# Questions?

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- 1. Get software ready.
  - Most school computers should have R and Rstudio.
  - If you use personal computer, finish R and RStudio installation
- 2. Run sample R code for week 1.

# Suggested additional reading

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- The [R Project Homepage](#)
- [R Tutorial](#) - web site at Clarkson University Department of Mathematics
- [DataCamp](#) offers a free *Introduction to R* course and many additional courses with subscription.
- R for data science (package: tidyverse)
  - <https://r4ds.had.co.nz/>
- Rmarkdown for reporting
  - <https://bookdown.org/yihui/rmarkdown/>