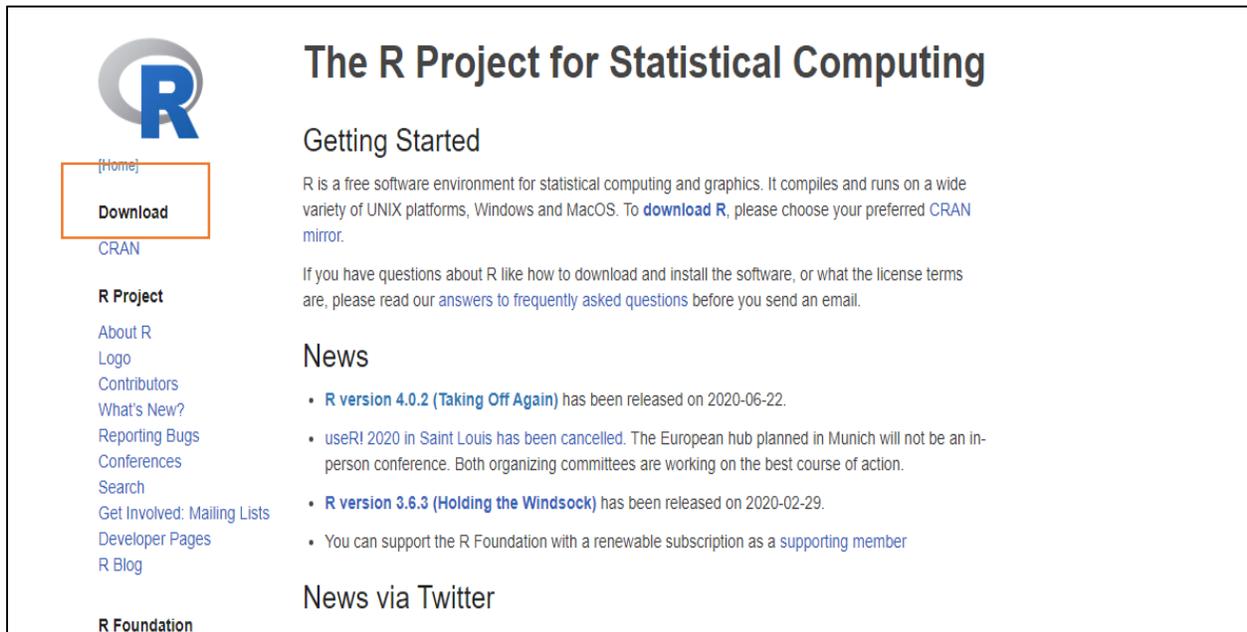


# How to install R

- ✓ This document explains about the detailed installation step for bioinformatics software.
- ✓ Go to <https://www.r-project.org/> and do the following (assuming you work on a windows computer).

## 1. Click on CRAN (highlighted in orange box)





## The R Project for Statistical Computing

### Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To **download R**, please choose your preferred CRAN mirror.

If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

### News

- **R version 4.0.2 (Taking Off Again)** has been released on 2020-06-22.
- **useR! 2020 in Saint Louis has been cancelled.** The European hub planned in Munich will not be an in-person conference. Both organizing committees are working on the best course of action.
- **R version 3.6.3 (Holding the Windsock)** has been released on 2020-02-29.
- You can support the R Foundation with a renewable subscription as a [supporting member](#)

### News via Twitter

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CRAN

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Developer Pages  
R Blog

R Foundation

## 2. Choose download site (under Belgium) (highlighted in orange box)

CRAN Mirrors	
The Comprehensive R Archive Network is available at the following URLs, please choose a location close to you. Some statistics on the status of the mirrors can be found here: <a href="#">main page</a> , <a href="#">windows release</a> , <a href="#">windows s</a>	
If you want to host a new mirror at your institution, please have a look at the <a href="#">CRAN Mirror HOWTO</a> .	
0-Cloud	<a href="https://cloud.r-project.org/">https://cloud.r-project.org/</a> Automatic redirection to servers worldwide, currently sponsored by Rstudio
Algeria	<a href="https://cran.usthb.dz/">https://cran.usthb.dz/</a> University of Science and Technology Houari Boumediene
Argentina	<a href="http://mirror.fcaglp.unlp.edu.ar/CRAN/">http://mirror.fcaglp.unlp.edu.ar/CRAN/</a> Universidad Nacional de La Plata
Australia	<a href="https://cran.csiro.au/">https://cran.csiro.au/</a> CSIRO <a href="https://mirror.aarnet.edu.au/pub/CRAN/">https://mirror.aarnet.edu.au/pub/CRAN/</a> AARNET <a href="https://cran.ms.unimelb.edu.au/">https://cran.ms.unimelb.edu.au/</a> School of Mathematics and Statistics, University of Melbourne <a href="https://cran.curtin.edu.au/">https://cran.curtin.edu.au/</a> Curtin University
Austria	<a href="https://cran.wu.ac.at/">https://cran.wu.ac.at/</a> Wirtschaftsuniversität Wien
Belgium	<a href="https://www.freeststatistics.org/cran/">https://www.freeststatistics.org/cran/</a> Patrick Wessa <a href="https://lib.ugent.be/CRAN/">https://lib.ugent.be/CRAN/</a> Ghent University Library
Brazil	<a href="https://nbcgib.uesc.br/mirrors/cran/">https://nbcgib.uesc.br/mirrors/cran/</a> Computational Biology Center at Universidade Estadual de Santa Cruz <a href="https://cran-r.c3sl.ufpr.br/">https://cran-r.c3sl.ufpr.br/</a> Universidade Federal do Parana <a href="https://cran.fiocruz.br/">https://cran.fiocruz.br/</a> Oswaldo Cruz Foundation, Rio de Janeiro <a href="https://yips.fmvz.usp.br/CRAN/">https://yips.fmvz.usp.br/CRAN/</a> University of Sao Paulo, Sao Paulo <a href="https://brieger.esalq.usp.br/CRAN/">https://brieger.esalq.usp.br/CRAN/</a> University of Sao Paulo, Piracicaba
Bulgaria	<a href="https://ftp.uni-sofia.bg/CRAN/">https://ftp.uni-sofia.bg/CRAN/</a> Sofia University
Canada	<a href="https://mirror.rcg.sfu.ca/mirror/CRAN/">https://mirror.rcg.sfu.ca/mirror/CRAN/</a> Simon Fraser University, Burnaby <a href="https://muug.ca/mirror/cran/">https://muug.ca/mirror/cran/</a> Manitoba Unix User Group <a href="https://mirror.its.dal.ca/cran/">https://mirror.its.dal.ca/cran/</a> Dalhousie University, Halifax <a href="http://cran.utstat.utoronto.ca/">http://cran.utstat.utoronto.ca/</a> University of Toronto
Chile	<a href="https://cran.dcc.uchile.cl/">https://cran.dcc.uchile.cl/</a> Departamento de Ciencias de la Computación, Universidad de Chile <a href="https://cran.dme.ufro.cl/">https://cran.dme.ufro.cl/</a> Departamento de Matemática y Estadística, Universidad de La Frontera
China	<a href="https://mirrors.tuna.tsinghua.edu.cn/CRAN/">https://mirrors.tuna.tsinghua.edu.cn/CRAN/</a> TUNA Team, Tsinghua University <a href="https://mirrors.bfsu.edu.cn/CRAN/">https://mirrors.bfsu.edu.cn/CRAN/</a> Beijing Foreign Studies University <a href="https://mirrors.ustc.edu.cn/CRAN/">https://mirrors.ustc.edu.cn/CRAN/</a> University of Science and Technology of China <a href="https://mirror-hk.koddos.net/CRAN/">https://mirror-hk.koddos.net/CRAN/</a> KoDDoS in Hong Kong <a href="https://mirrors.e-ducation.cn/CRAN/">https://mirrors.e-ducation.cn/CRAN/</a> Elite Education

### 3. Choose Windows as target operation system (highlighted in orange box)

The screenshot shows the CRAN website with the 'Download and Install R' section. The 'Download R for Windows' link is highlighted with an orange box. The page content includes:

**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 MacOS 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 (2020-06-22, Taking Off Again) [R-4.0.2.tar.gz](#), read [what's new](#) in the latest version.
- Sources of [R.alpha and beta releases](#) (daily snapshots, created only in time periods before a planned release).
- Daily snapshots of current patched and development versions are [available here](#). Please read about [new features and bug fixes](#) before filing corresponding feature requests or bug reports.
- Source code of older versions of R is [available here](#).
- Contributed extension [packages](#)

**Questions About R**

- If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

**What are R and CRAN?**  
 R is 'GNU S', a freely available language and environment for statistical computing and graphics which provides a wide variety of statistical and graphical techniques: linear and nonlinear modelling, statistical tests, time series analysis, classification, clustering, etc. Please consult the [R project homepage](#) for further information.

CRAN is a network of ftp and web servers around the world that store identical, up-to-date, versions of code and documentation for R. Please use the CRAN [mirror](#) nearest to you to minimize network load.

**Submitting to CRAN**  
 To "submit" a package to CRAN, check that your submission meets the [CRAN Repository Policy](#) and then use the [web form](#).

If this fails, upload to <ftp://CRAN.R-project.org/incoming/> and send an email to [CRAN-submissions@R-project.org](mailto:CRAN-submissions@R-project.org) following the policy. Please do not attach submissions to emails, because this will clutter up the mailboxes of half a dozen people.

Note that we generally do not accept submissions of precompiled binaries due to security reasons. All binary distribution listed above are compiled by selected maintainers, who are in charge for all binaries of their platform, respectively.

This year's winter break will be from Dec 18, 2020 to Jan 4, 2021.

#### 4. Click base (highlighted in orange box)

The screenshot shows the CRAN website for Windows. The 'base' link under 'Subdirectories:' is highlighted with an orange box. The page content includes:

**Subdirectories:**

- base** (highlighted): 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.

#### 5. Click Download R 4.0.2 (highlighted in orange box)

The screenshot shows the CRAN website for R-4.0.2 for Windows (32/64 bit). The 'Download R 4.0.2 for Windows (84 megabytes, 32/64 bit)' link is highlighted with an orange box. The page content includes:

**R-4.0.2 for Windows (32/64 bit)**

[Download R 4.0.2 for Windows \(84 megabytes, 32/64 bit\)](#) (highlighted)

[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?](#)

Please see the [R FAQ](#) for general information about R and the [R Windows FAQ](#) for Windows-specific information.

**Other builds**

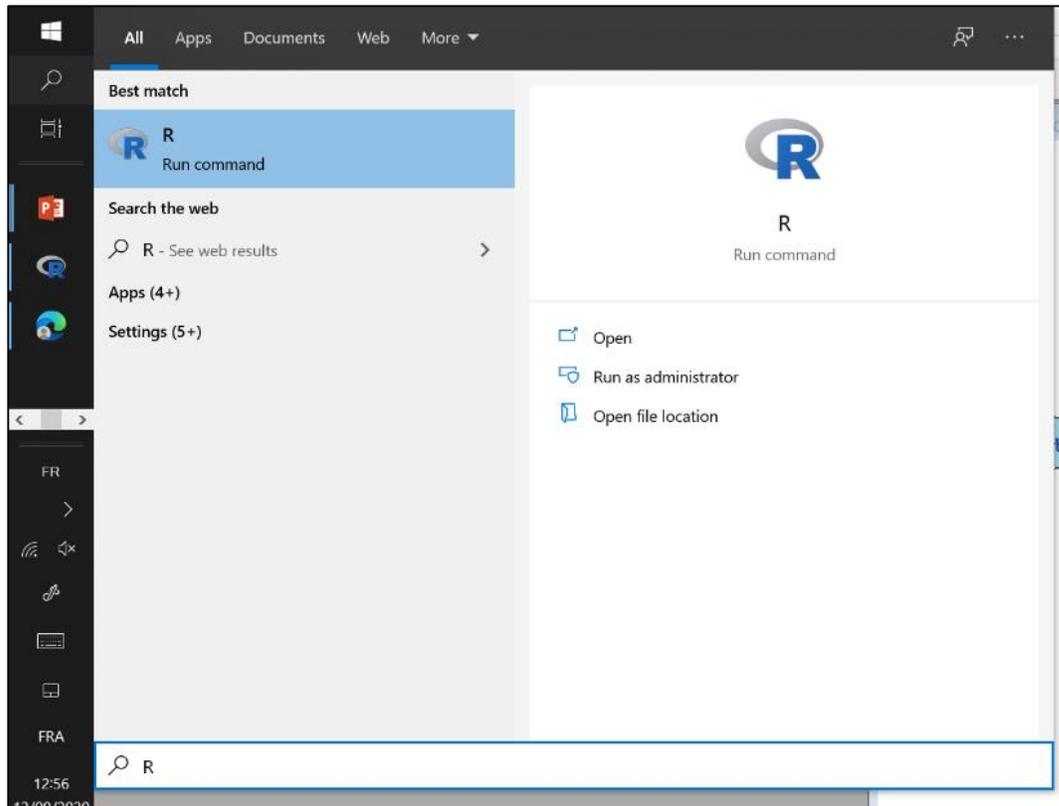
- Patches to this release are incorporated in the [r-patched snapshot build](#).
- A build of the development version (which will eventually become the next major release of R) is available in the [r-devel snapshot build](#).
- [Previous releases](#)

Note to webmasters: A stable link which will redirect to the current Windows binary release is [<CRAN MIRROR> bin/windows/base/release.html](#).

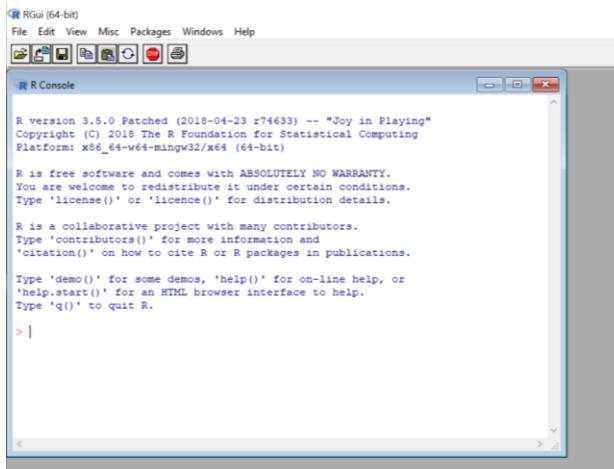
Last change: 2020-06-22

## 6. Download the .exe file and run it (choose default answers for all questions)

## 7. Search R and open window



## 8. R window will appear as given below:



**READY TO WORK ON R!!!**

# How to install RStudio

1. GO to <https://rstudio.com/products/rstudio/download/>

Download RStudio

Choose Your Version

RStudio is a set of integrated tools designed to help you be more productive with R. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace.

[LEARN MORE ABOUT RSTUDIO FEATURES](#)

RStudio Team

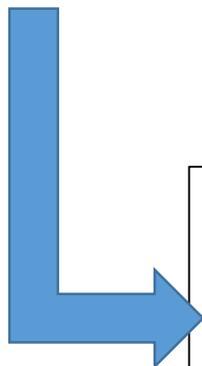
RStudio's new solution for every professional data science team. RStudio Team includes RStudio Server Pro, RStudio Connect and RStudio Package Manager.

[LEARN MORE](#)

RStudio Desktop	RStudio Desktop	RStudio Server	RStudio Server Pro
Open Source License	Commercial License	Open Source License	Commercial License
Free	\$995	Free	\$4,975
	/year		/year (5 Named Users)

2. Select **DOWNLOAD (RStudio Desktop)**

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



RStudio Desktop 1.3.1073 - [Release Notes](#)

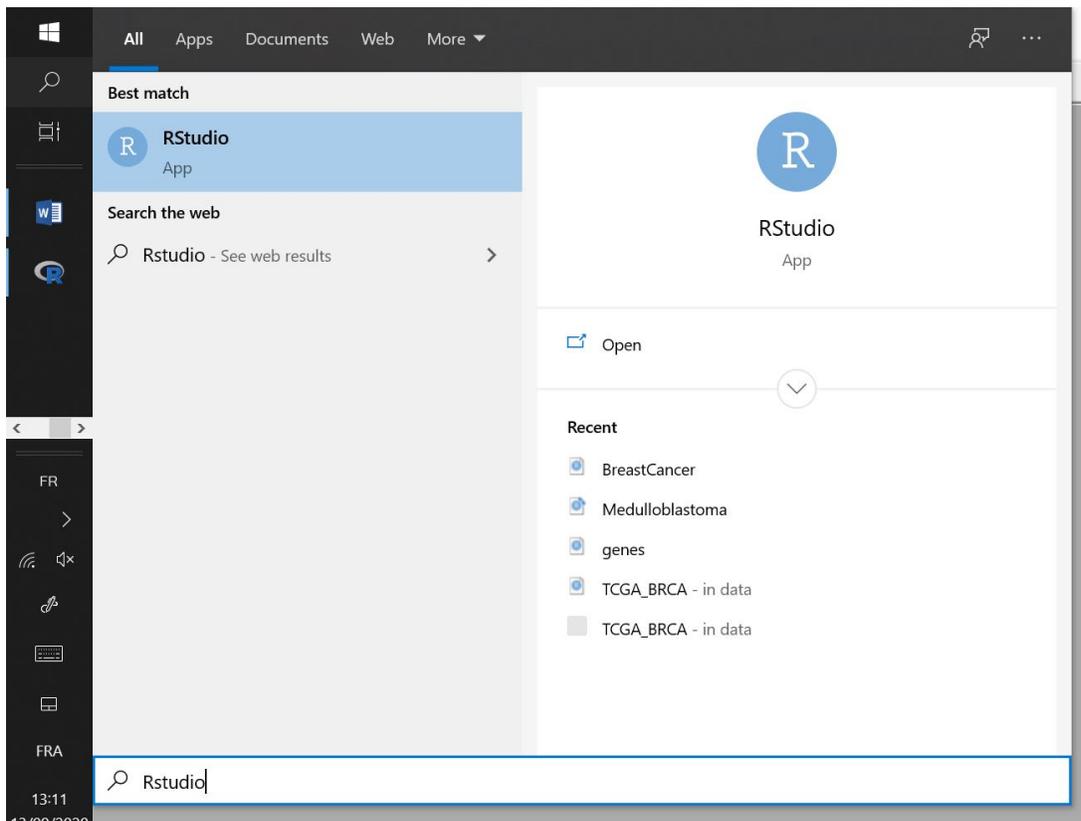
1. Install R. RStudio requires R 3.0.1+.
2. Download RStudio Desktop. Recommended for your system:

[DOWNLOAD RSTUDIO FOR WINDOWS](#)  
1.3.1073 | 171.62MB

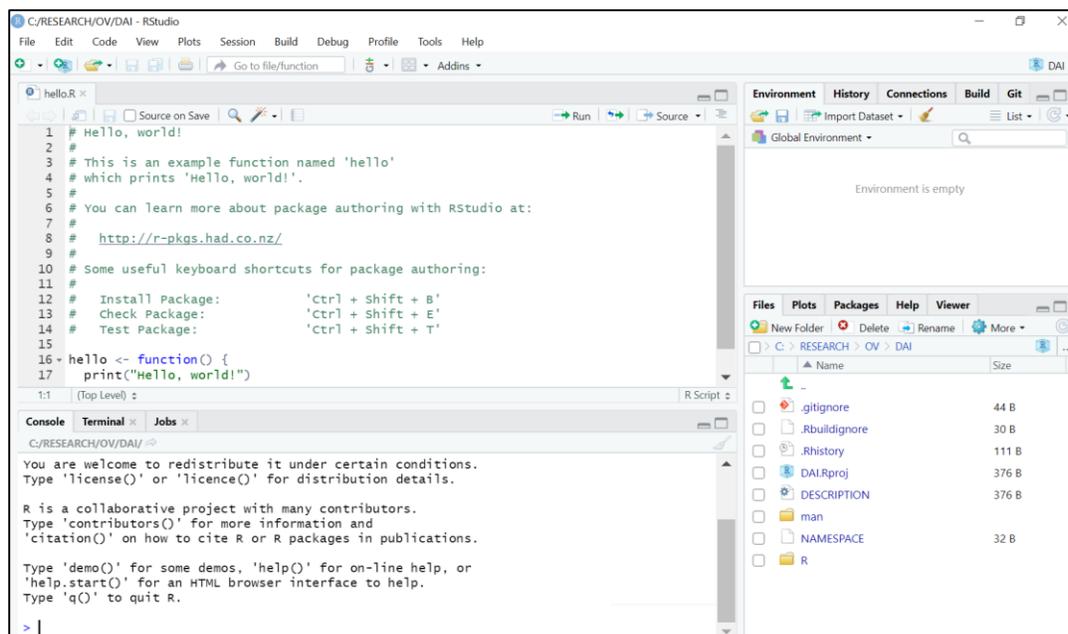
Requires Windows 10/8/7 (64-bit)

### 3. Download the .exe file and run it (choose default answers for all questions)

### 4. Search RStudio and open



### Rstudio layout

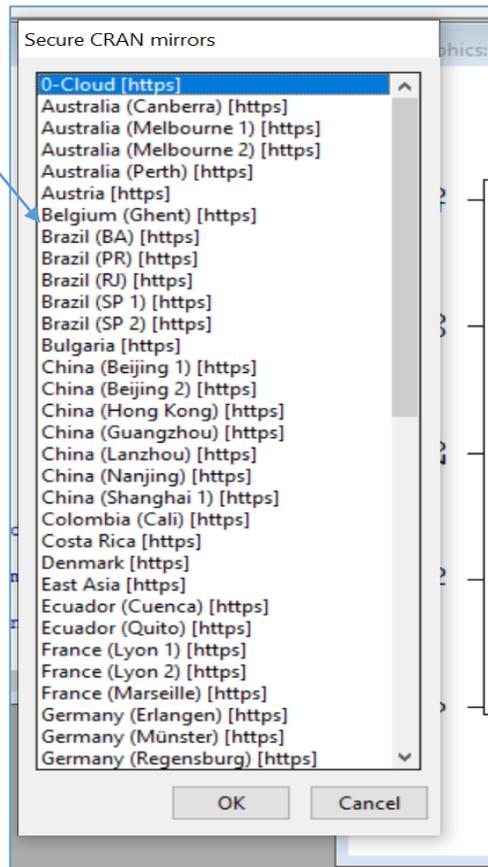


**READY TO WORK ON R and RStudio!!!**

- Let us install ggplot2 R packages

Type : `install.packages("ggplot2")`

select Belgium



```
> install.packages("ggplot2")
Installing package into 'C:/Users/archana/Documents/Administrator/R/win-library/3.6'
(as 'lib' is unspecified)
trying URL 'https://lib.ugent.be/CRAN/bin/windows/contrib/3.6/ggplot2_3.3.2.zip'
Content type 'application/zip' length 4068914 bytes (3.9 MB)
downloaded 3.9 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:\Users\archana\AppData\Local\Temp\Rtmpw5XZH3\downloaded_packages
```

**Message : ggplot2 installed successfully!**

## Install Few R packages

`install.packages("Correlograms")`

`install.packages("circlize")`

`install.packages("igraph")`

## Install PLINK

1. Go to link <https://www.cog-genomics.org/plink/1.9/> and select based on operating system

The screenshot shows the PLINK 1.9.0 beta website. The main content area is titled "PLINK 1.90 beta" and includes a "Binary downloads" section. This section contains a table with columns for "Operating system", "Stable (beta 6.18, 16 Jun)", "Development (16 Jun)", and "Old2 (v1.07)".

Operating system <sup>1</sup>	Stable (beta 6.18, 16 Jun)	Development (16 Jun)	Old2 (v1.07)
Linux 64-bit	<a href="#">download</a>	<a href="#">download</a>	<a href="#">download</a>
Linux 32-bit	<a href="#">download</a>	<a href="#">download</a>	<a href="#">download</a>
macOS (64-bit)	<a href="#">download</a>	<a href="#">download</a>	<a href="#">download (32-bit)</a>
Windows 64-bit	<a href="#">download</a>	<a href="#">download</a>	<a href="#">download</a>
Windows 32-bit	<a href="#">download</a>	<a href="#">download</a>	<a href="#">download</a>

Below the table, there are notes: "1. Solaris is no longer explicitly supported, but it should be able to run the Linux binaries." and "2. These are just mirrors of the binaries posted at <http://zzz.bwh.harvard.edu/plink/download.shtml>." There is also a section for "The following documented PLINK 1.07 flags are not supported by 1.90 beta 6:" with a list of flags like `--qual-geno-scores3`, `--segment4`, `--dfam`, `--tucc`, `--p2, --getnedrop`, `--hap, --hap-window, --hap-sngs5`, `--proxy-assoc, --proxy-impute5`, `--civ-list, --cfile, --gfile`, `--id-dict, --id-match6`, and `--compress, --decompress7`.

2. Uncompress the `plink_win32_20200616.zip` Click on the folder.
3. There are two files
  - `test.map` contains the marker information
  - `test.ped` contains genotype data and sample information
4. `plink.exe` file will be used for the GWAS.