

MC3020 - Introduction to R and Rstudio

Part 1: Installing R and RStudio on Your Computer: A Step-by-Step Guide

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The instructions in this slide include screenshots from the installation process in which we used the Chrome browser, which, although not necessary, you can freely download and install from here: <https://www.google.com/chrome/>.

Slides are prepared through RMarkdown Beamer presentation option and executed via RStudio.

RStudio is an interactive desktop environment, but it is not R, nor does it include R when you download and install it. Therefore, to use RStudio, we first need to install R.

Introduction

R and RStudio are powerful and widely-used tools in the field of data analysis, statistical computing, and programming.

R is an open-source programming language specifically designed for statistical analysis, data visualization, and data manipulation. It offers a vast array of statistical and graphical techniques, making it a popular choice among researchers, statisticians, and data scientists.

Together, R and RStudio create a powerful environment for data analysis. R provides the statistical capabilities and data manipulation functions, while RStudio provides a user-friendly interface and efficient workflow management. This combination allows users to easily explore, analyze, and visualize data, build statistical models, and create reproducible reports.

Section 1

Installing R

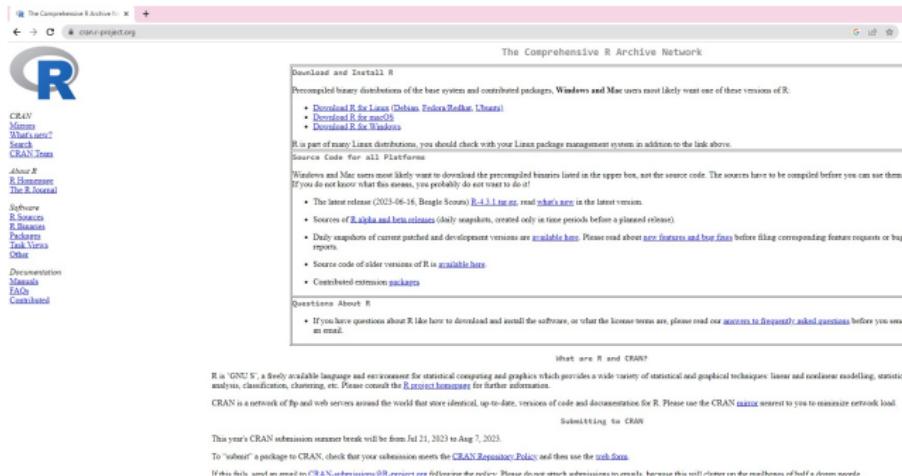
Step 1:

You can download R from the Comprehensive R Archive Network ([CRAN](#)). Search for CRAN on your browser:

The screenshot shows a Google search results page for the query "CRAN". The top navigation bar includes the Google logo, a search bar with the query "CRAN", and various search filters like Images, Videos, News, Meaning, Packages, Mirror, Apple, Vodka, and Grape. Below the search bar, it says "About 106,000,000 results (0.31 seconds)". The first result is a link to "The R Project for Statistical Computing" with the URL "https://cran.r-project.org". The snippet for this result reads: "The Comprehensive R Archive Network 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 ...". Below this, there's a snippet for a blog post titled "officer: Manipulation of Microsoft Word and PowerPoint D..." dated March 28, 2023. Further down, there are links for "R-4.3.1 for Windows" and "CRAN Packages By Name". At the bottom, there's a "People also ask" section with the question "What is the CRAN?".

Step 2:

Once on the CRAN page, select the version for your operating system: Linux, Mac OS X, or Windows.



The screenshot shows the 'Download and Install R' section of the CRAN website. It includes links for Windows, Mac OS X, and Linux distributions, along with instructions for Linux users to check their package management system. Below this is a 'Source Code for all platforms' section with links for R-4.2.1.tar.gz, R-4.2.1.zip, and R-4.2.1.tar.bz2. Further down are sections for 'Questions About R' and 'What are R and CRAN?'. At the bottom, there's information about CRAN submission policies and a note about file size limits.

[Download R for Windows \(Debian, Ubuntu, Redhat, Linux\)](#)

[Download R for Mac OS](#)

[Download R for Linux](#)

It 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 more 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 (2023-06-16, Biocle Sosna) [R-4.2.1.tar.gz](#), [read .whats_new](#) is the latest version.
- Sources of [R-4.2.1 and later releases](#) (daily snapshots, created only a few hours 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 analysis, classification, clustering, etc. Please consult the [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](#)

This year's CRAN submission deadline will be from July 21, 2023 to Aug 7, 2023.

To "submit" a package to CRAN, check that your submission meets the [CRAN Submission Policy](#) and then use the [submit](#) function.

If this fails, send an email to [CRAN.Robotics@R-project.org](#) following the notes. Please do not attach submissions to emails, because this will clutter up the mailboxes of half a dozen people.

Here we show screenshots for Windows, but the process is similar for the other platforms.

Step 3:

Once at the CRAN download page, you will have several choices. You want to install the base sub-directory. This installs the basic packages you need to get started. We will later learn how to install other needed packages from within R, rather than from this webpage.

The screenshot shows the CRAN download page for Windows. At the top, there's a navigation bar with links for "The Comprehensive R Archive Network", "cran.r-project.org", and "R for Windows". Below the navigation bar, there's a large "R" logo. The main content area is titled "R for Windows" and contains sections for "Subdirectories" and "Binaries". The "Subdirectories" section lists "base", "contrib", "old contrib", and "Rtools". The "base" link is highlighted with a blue border. The "base" link is described as "Binaries for base distribution. This is what you want to [install R for the first time](#)". The "contrib" link is described as "Binaries of contributed CRAN packages (for R >= 3.4.x)". The "old contrib" link is described as "Binaries of contributed CRAN packages for outdated versions of R. (for R < 3.4.x)". The "Rtools" link is described as "Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself". Below these sections, there's a note: "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." Another note says: "You may also want to read the [R FAQ](#) and [R for Windows FAQ](#)". A final note states: "Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables."

Step 4:

Click on the link for the latest version to start the download.

The screenshot shows a web browser displaying the CRAN Windows page. The title bar reads "The Comprehensive R Archive Network". The main content area is titled "R-4.3.1 for Windows". It features a large blue "R" logo on the left. Below the title, there are three links: "Download R-4.3.1 for Windows" (79 megabytes, 64 bit), "README on the Windows binary distribution", and "New features in this version". A note states: "This build requires UCRT, which is part of Windows since Windows 10 and Windows Server 2016. On older systems, UCRT has to be installed manually from [here](#)". Another note says: "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". There are two sections of frequently asked questions: "Does R run under my version of Windows?" and "How do I update packages in my previous version of R?". A note below says: "Please see the [R.FAQ](#) for general information about R and the [R Windows FAQ](#) for Windows-specific information." To the right, there is a section titled "Other builds" with links to "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](#)", and "Previous releases". A note at the bottom says: "Note to webmasters: A stable link which will redirect to the current Windows binary release is [<CRAN MIRROR>-bin/windows/base/release.html](#)". At the very bottom, it says "Last change: 2023-06-16".

Step 5:

If you are using Chrome, at the bottom of your browser you should see a tab that shows you the progress of the download. Once the installer file downloads, you can click on that tab to start the installation process. Other browsers may be different, so you will have to find where they store downloaded files and click on them to get the process started.

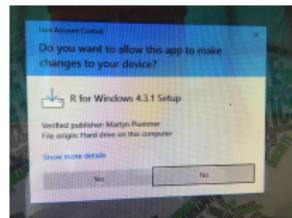
The screenshot shows a web browser window with the URL cran.r-project.org. The main content is the 'Download R-4.3.1 for Windows' page. Key visible text includes:

- Download R-4.3.1 for Windows (79 megabytes, 64 bit)
- README on the windows binary distribution
- New features in this version
- This build requires UCRT, which is part of Windows since Windows 10 and Windows Server 2016. On older systems, UCRT has to be installed manually from [here](#).
- 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 this page.
- Frequently asked questions
- Please see the [R FAQ](#) for general information about R and the [R Windows FAQ](#) for Windows-specific information.
- Other builds
 - Pointers to this release are incorporated in the [snapshot build](#).
 - A build of the development version (which will eventually become the next major release of R) is available in the [snapshot build](#).
 - [Previous releases](#)
- Note to retransfers: A stable link which will redirect to the current Windows binary release is [CRAN/MIRRORS-bin/windows-base/index.html](#).

At the bottom of the page, it says "Last change: 2023-06-16".

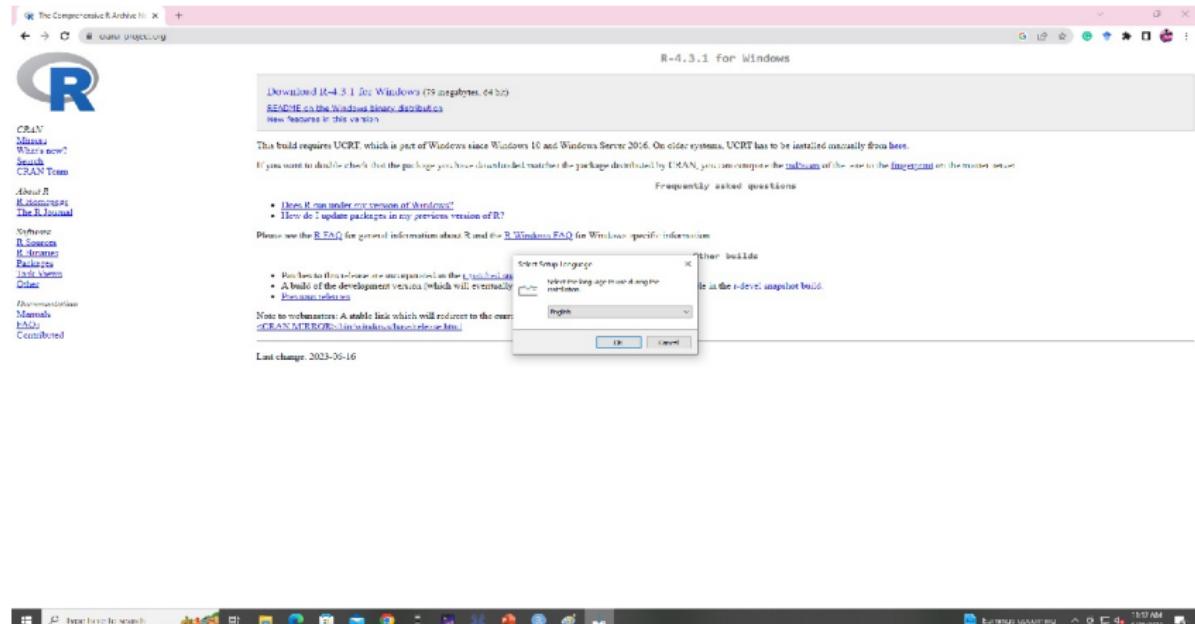
Step 6:

You can now click through different choices to finish the installation. We recommend you select all the default choices.

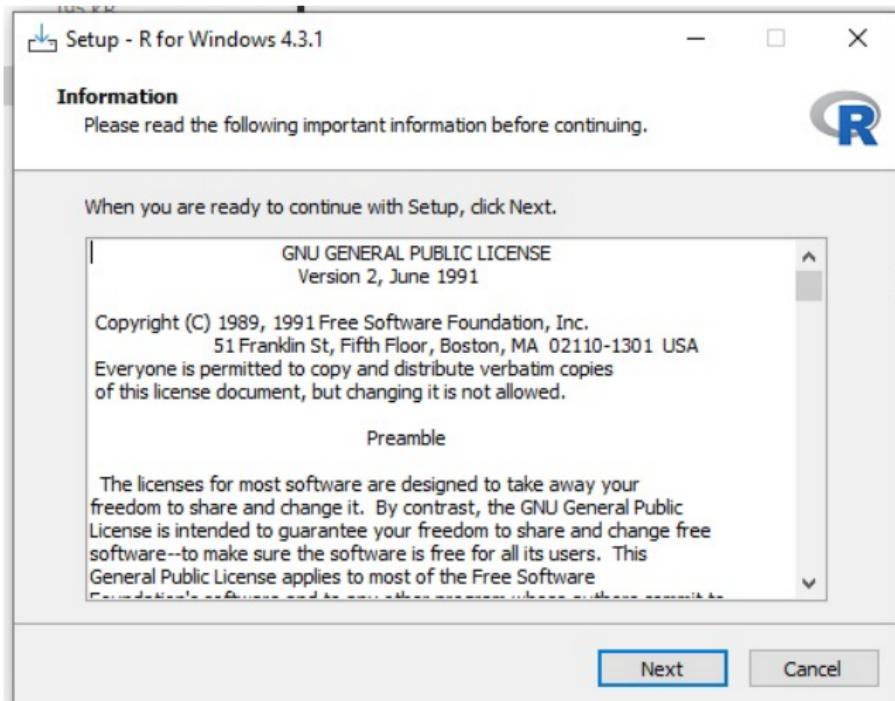


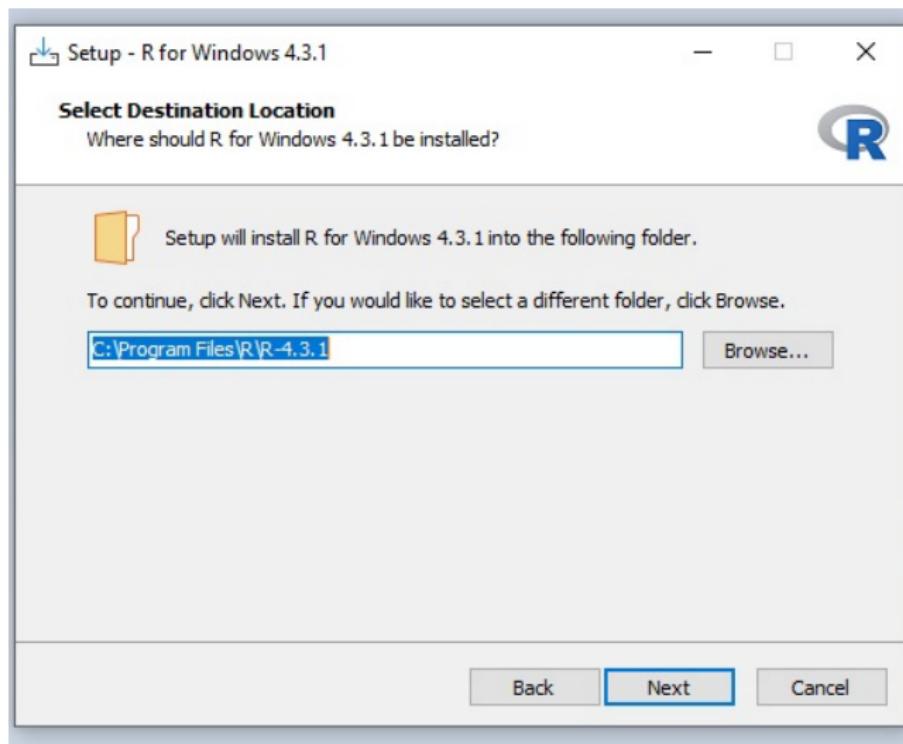
Select the default even when you get an ominous warning.

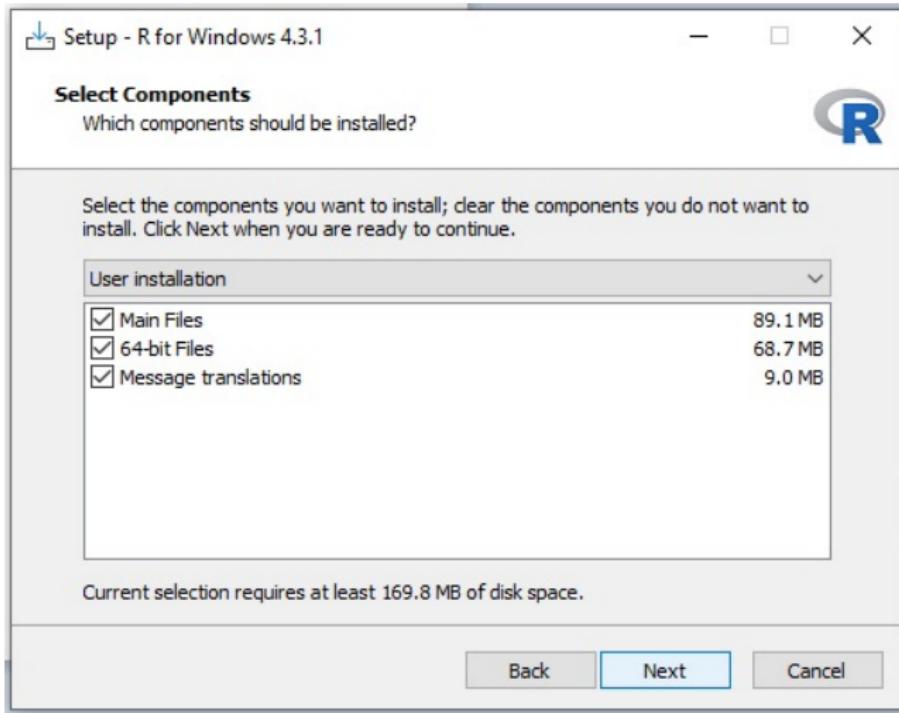
When selecting the language, consider that it will be easier to follow this book if you select English.

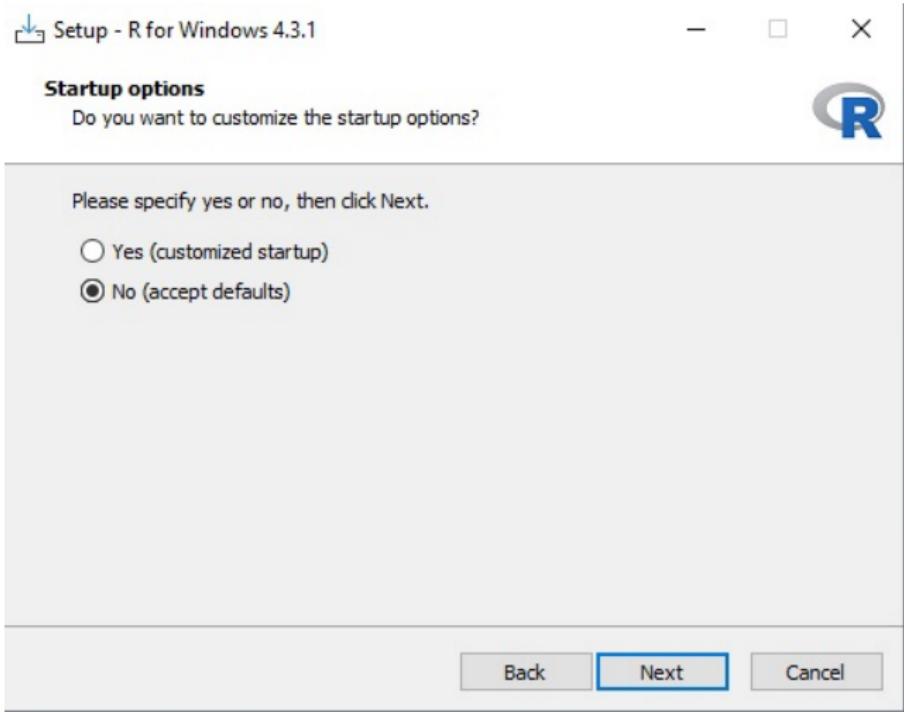


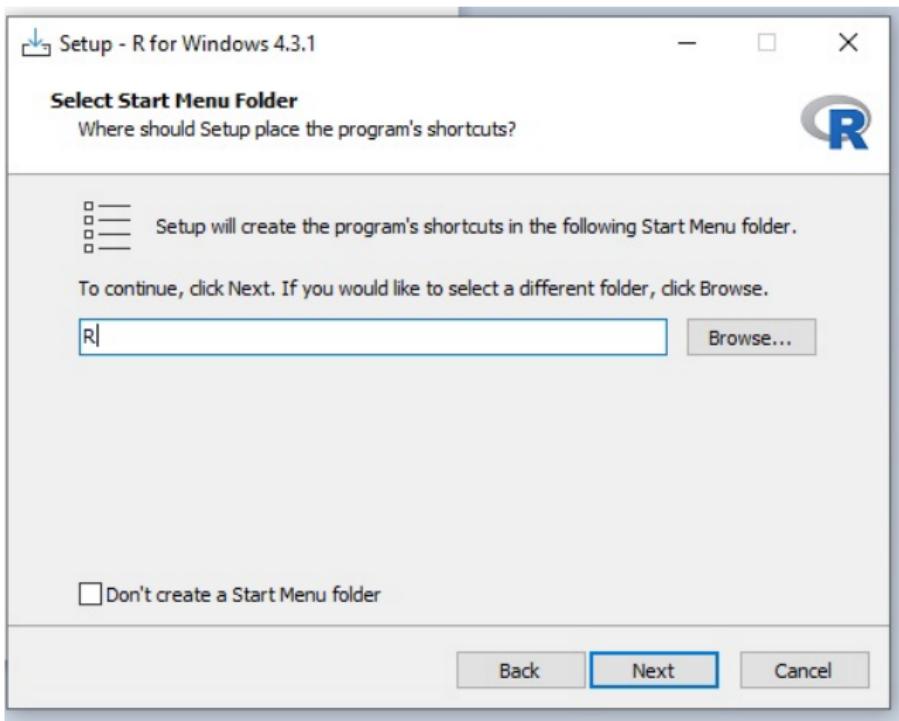
Continue to select all the defaults:

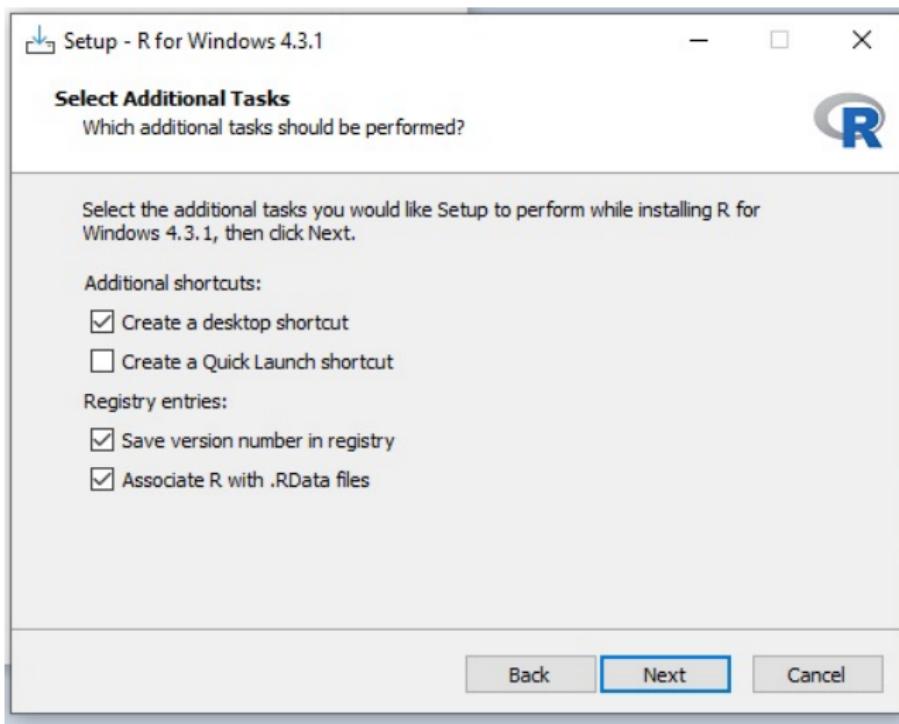


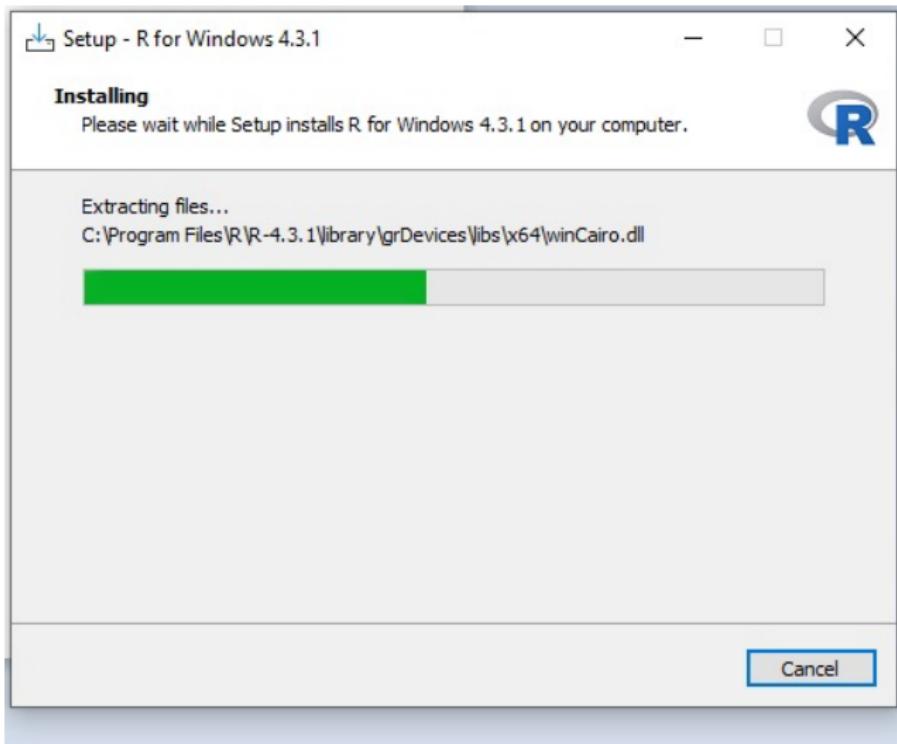


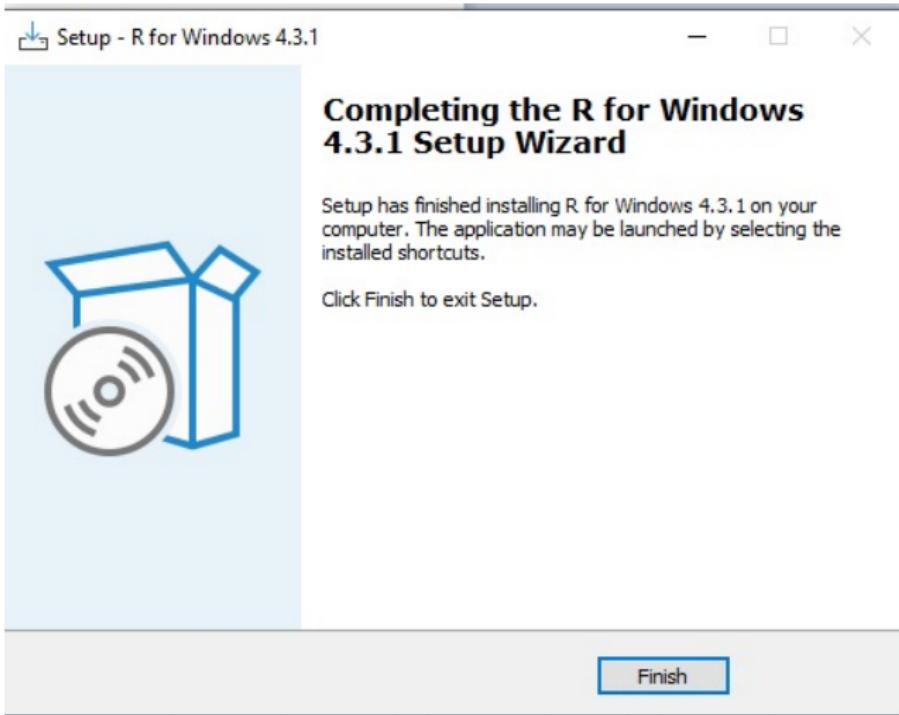












On the Mac it looks different, but you are also accepting the defaults:

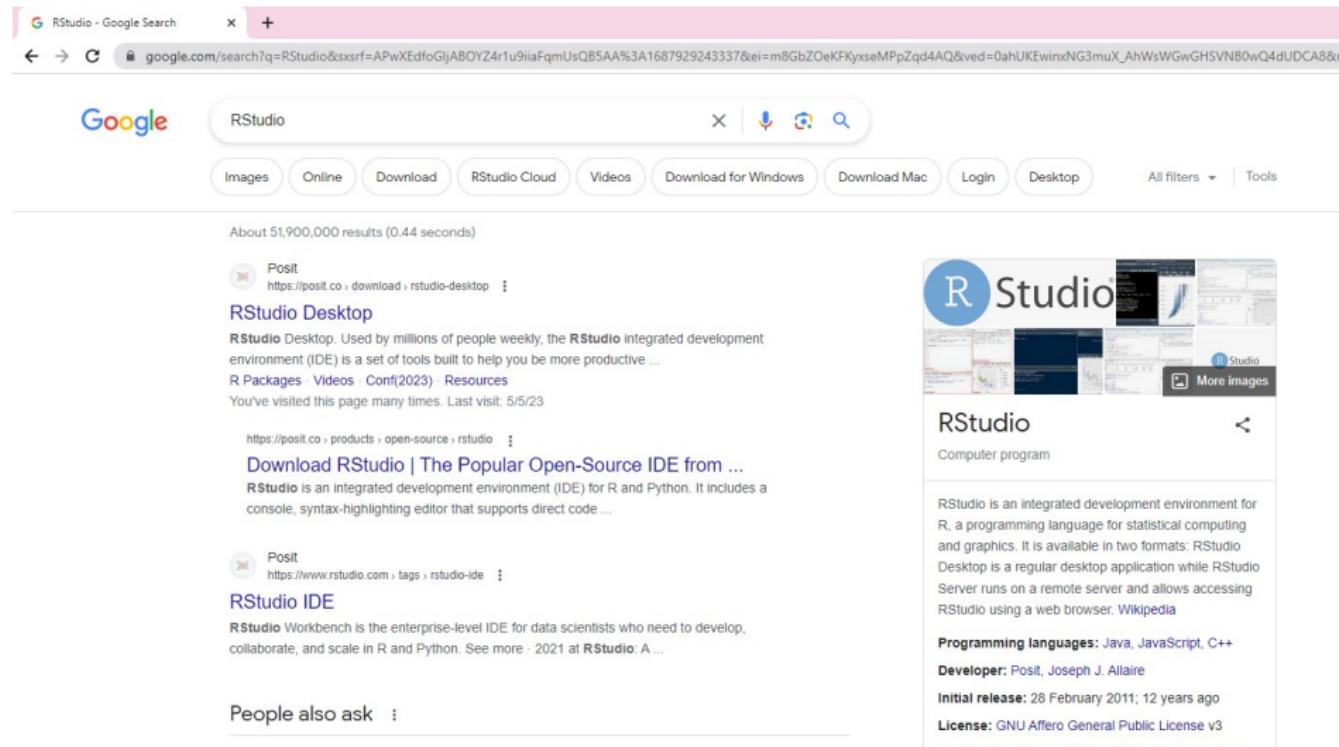
Congratulations! You have installed R.

Section 2

Installing RStudio

Step 1

You can start by searching for RStudio on your browser:



RStudio - Google Search

Google

RStudio

Images Online Download RStudio Cloud Videos Download for Windows Download Mac Login Desktop All filters Tools

About 51,900,000 results (0.44 seconds)

Posit
<https://posit.co> , download , rstudio-desktop ...

RStudio Desktop

RStudio Desktop. Used by millions of people weekly, the RStudio integrated development environment (IDE) is a set of tools built to help you be more productive ...

R Packages · Videos · Conf(2023) · Resources

You've visited this page many times. Last visit: 5/5/23

<https://posit.co/products/open-source/rstudio> ...

Download RStudio | The Popular Open-Source IDE from ...

RStudio is an integrated development environment (IDE) for R and Python. It includes a console, syntax-highlighting editor that supports direct code ...

Posit
<https://www.rstudio.com> , tags , rstudio-ide ...

RStudio IDE

RStudio Workbench is the enterprise-level IDE for data scientists who need to develop, collaborate, and scale in R and Python. See more · 2021 at RStudio: A ...

People also ask :

RStudio

RStudio is an integrated development environment for R, a programming language for statistical computing and graphics. It is available in two formats: RStudio Desktop is a regular desktop application while RStudio Server runs on a remote server and allows accessing RStudio using a web browser. [Wikipedia](#)

Programming languages: Java, JavaScript, C++
Developer: Posit, Joseph J. Allaire
Initial release: 28 February 2011; 12 years ago
License: GNU Affero General Public License v3
Operating system: Ubuntu, Fedora, Red Hat Linux

Step 2

You should find the **RStudio** (name changed last year as Posit) website as shown below. Once there, click on Download RStudio desktop for window.



DOWNLOAD

RStudio Desktop

Used by millions of people weekly, the RStudio integrated development environment (IDE) is a set of tools built to help you be more productive with R and Python.

If you're a professional data scientist and need common enterprise features, you might also want to consider [Posit Workbench](#).

1: Install R

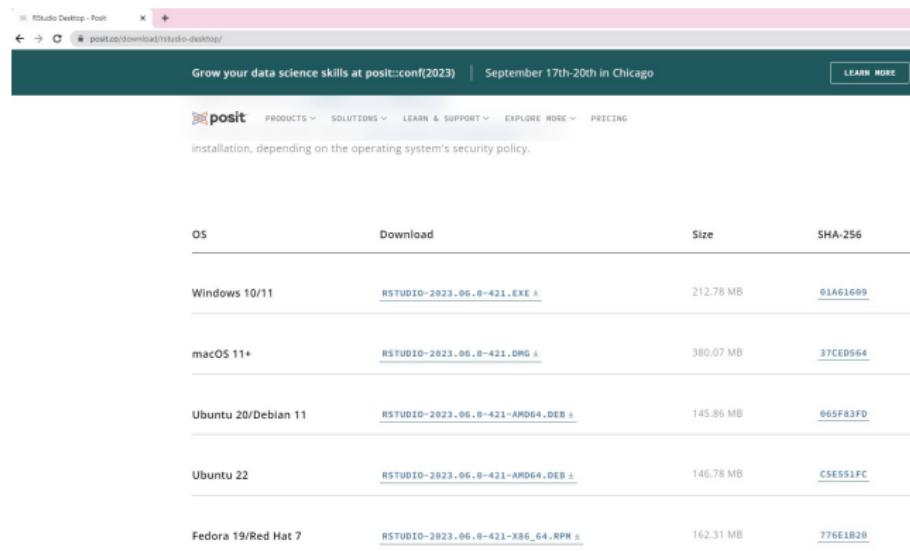
RStudio requires R 3.3.0+. Choose a version of R that matches your computer's operating system.

2: Install RStudio

[DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS](#)

Step 3

This will give you several options. For what we do in course, it is more than enough to use the free Desktop version. Also, you can find RStudio for other OS platforms such as Linux, Mac, etc.

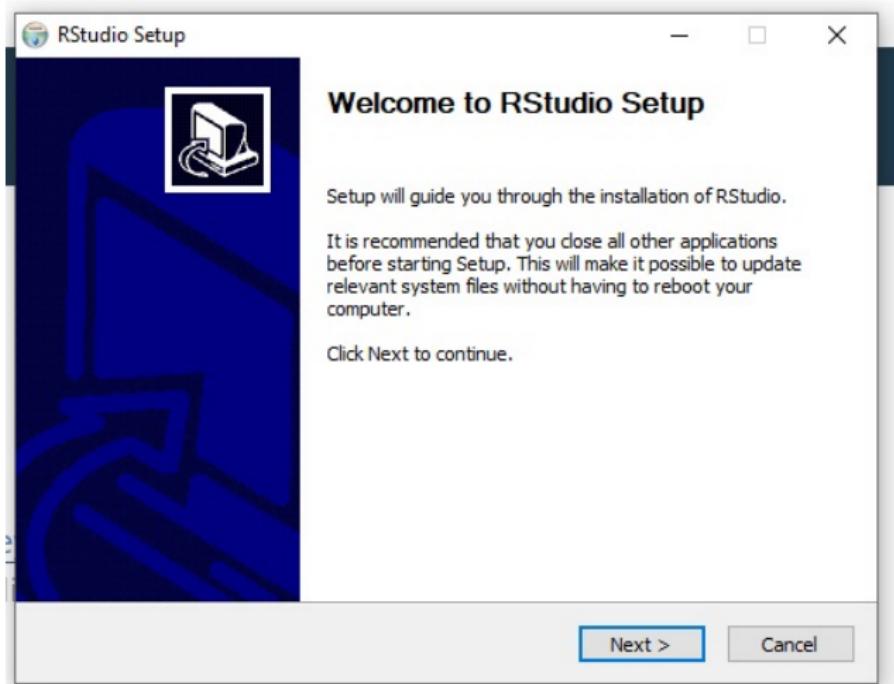


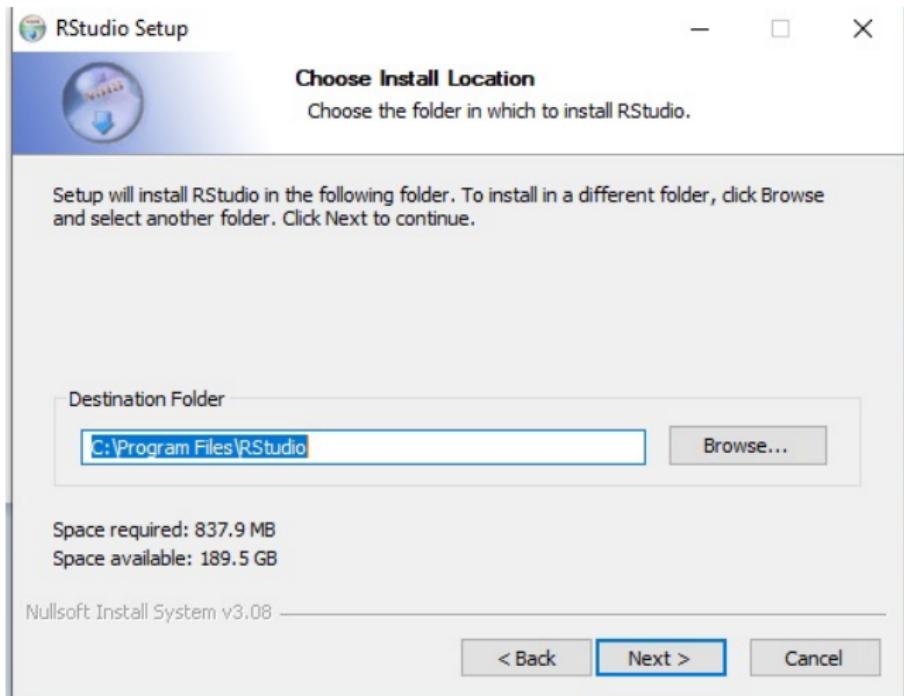
The screenshot shows the RStudio Desktop download page on posit.co. The top navigation bar includes links for 'PRODUCTS', 'SOLUTIONS', 'LEARN & SUPPORT', 'EXPLORE MORE', and 'PRICING'. A banner at the top reads 'Grow your data science skills at posit::conf(2023) | September 17th-20th in Chicago' with a 'LEARN MORE' button. Below the banner, a note states 'installation, depending on the operating system's security policy.' The main content is a table listing download links for various operating systems:

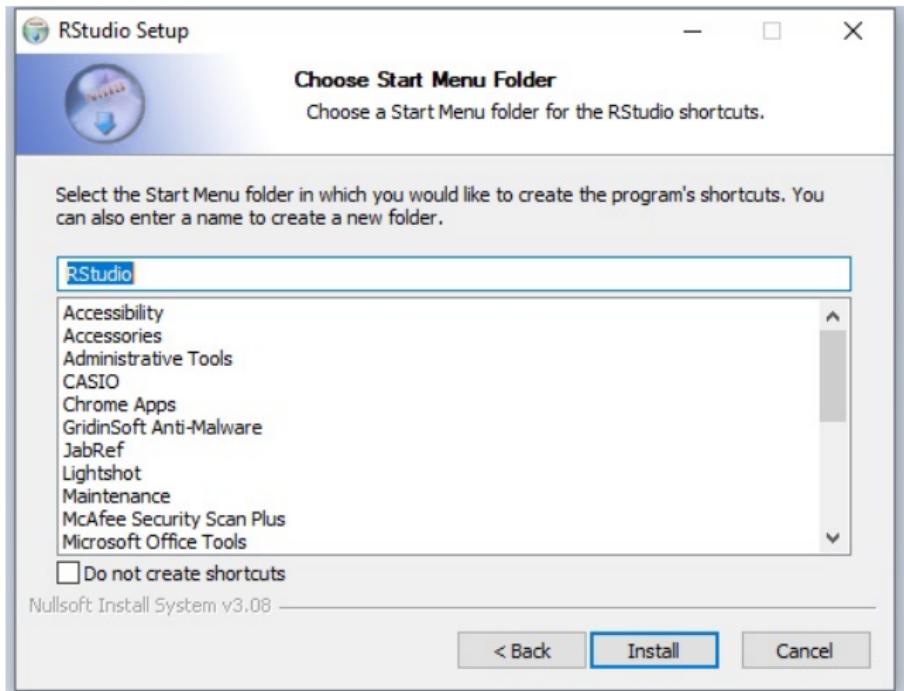
OS	Download	Size	SHA-256
Windows 10/11	RSTUDIO-2023.06.0-421.EXE	212.78 MB	01A61609
macOS 11+	RSTUDIO-2023.06.0-421.DMG	380.07 MB	37CED8564
Ubuntu 20/Debian 11	RSTUDIO-2023.06.0-421-AMD64.DEB	145.86 MB	065F83FD
Ubuntu 22	RSTUDIO-2023.06.0-421-AMD64.DEB	146.78 MB	C5E551FC
Fedora 19/Red Hat 7	RSTUDIO-2023.06.0-421-X86_64.RPM	162.31 MB	776E1B28

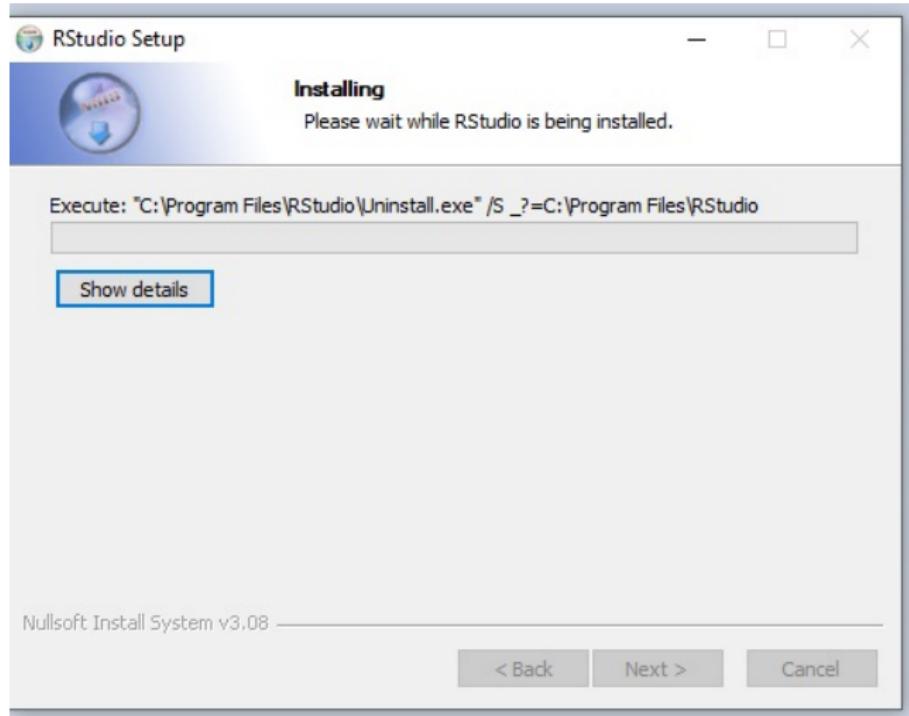
Step 4

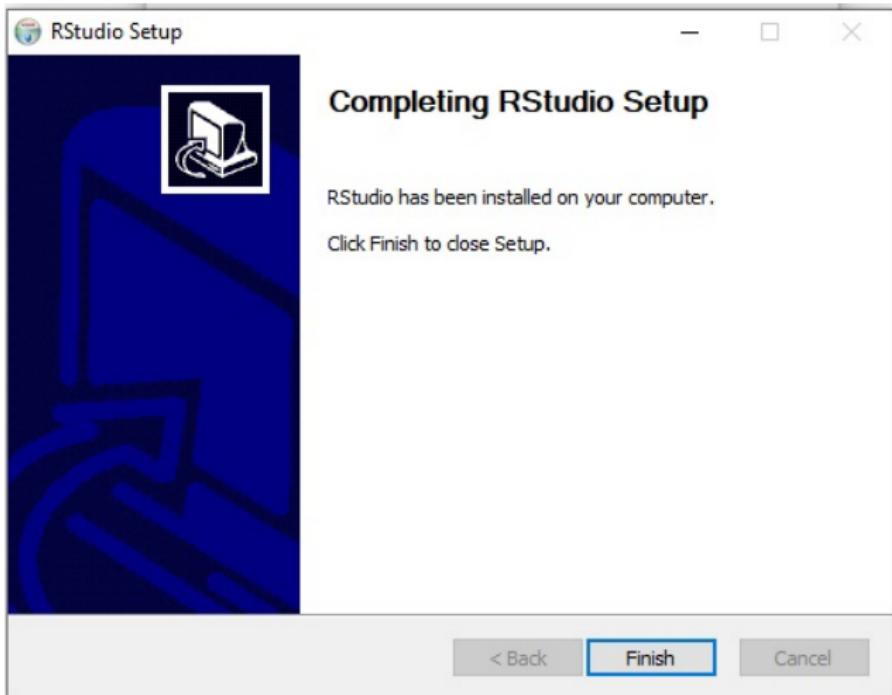
Once the installation file is downloaded, click on the downloaded file to start the installation process. We recommend clicking yes on all the defaults.











Congratulations! You have installed RStudio. You can now get started as you do on any other program in your computer. On Windows, you can open RStudio from the Start menu. If RStudio does not appear, you can search for it:

- You can attempt this installation procedure during our lecture on Friday, June 30, 2023, from 8:00 am to 10:00 am. If you encounter any difficulties while installing, please feel free to reach out to me for assistance.
- Additionally, please remember to bring your laptop to the lecture class on Tuesday, July 4, 2023, ensuring that you have both R and R Studio installed on it.
- The lecture slides for Part 2 will be uploaded soon. Please stay tuned for the update.

Don't hesitate to contact us if you have any questions about this course's teaching contents.

Also don't forget to check out the course page and Microsoft Team folder,

- course page <https://mayooran1987.github.io/MC3020/>
- Microsoft Team folder [link](#)

