

Quantitative Sociological Analysis

Statistical Software R with Rstudio Download Instructions and Tutorial

Spring 2025

R, what is it?

- R is an environment & language, software, for statistical computing & graphics
- Environment: collection of programs to perform tasks
- Language: how the environment communicates with a computer
 - we will tell R how to perform tasks

Download R and RStudio

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

The screenshot shows the RStudio Desktop download page. A red arrow points from the '1: Install R' section to the 'DOWNLOAD AND INSTALL R' button. A yellow box highlights the text 'First: install R' and 'RStudio is an additional program that makes using R easier'. The page includes a navigation bar, a search bar, and a footer with 'Activate Windows' text.

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.

Don't want to download or install anything? Get started with RStudio on [Posit Cloud for free](#). If you're a professional data scientist looking to download RStudio and also need common enterprise features, don't hesitate to [book a call with us](#).

Want to learn about core or advanced workflows in RStudio? Explore the [RStudio User Guide](#) or the [Getting Started](#) section.

1: Install R

RStudio requires R 3.6.0+. Choose a version of R that matches your computer's operating system.

R is not a Posit product. By clicking on the link below to download and install R, you are leaving the Posit website. Posit disclaims any obligations and all liability with respect to R and the R website.

DOWNLOAD AND INSTALL R

2: Install RStudio

DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS

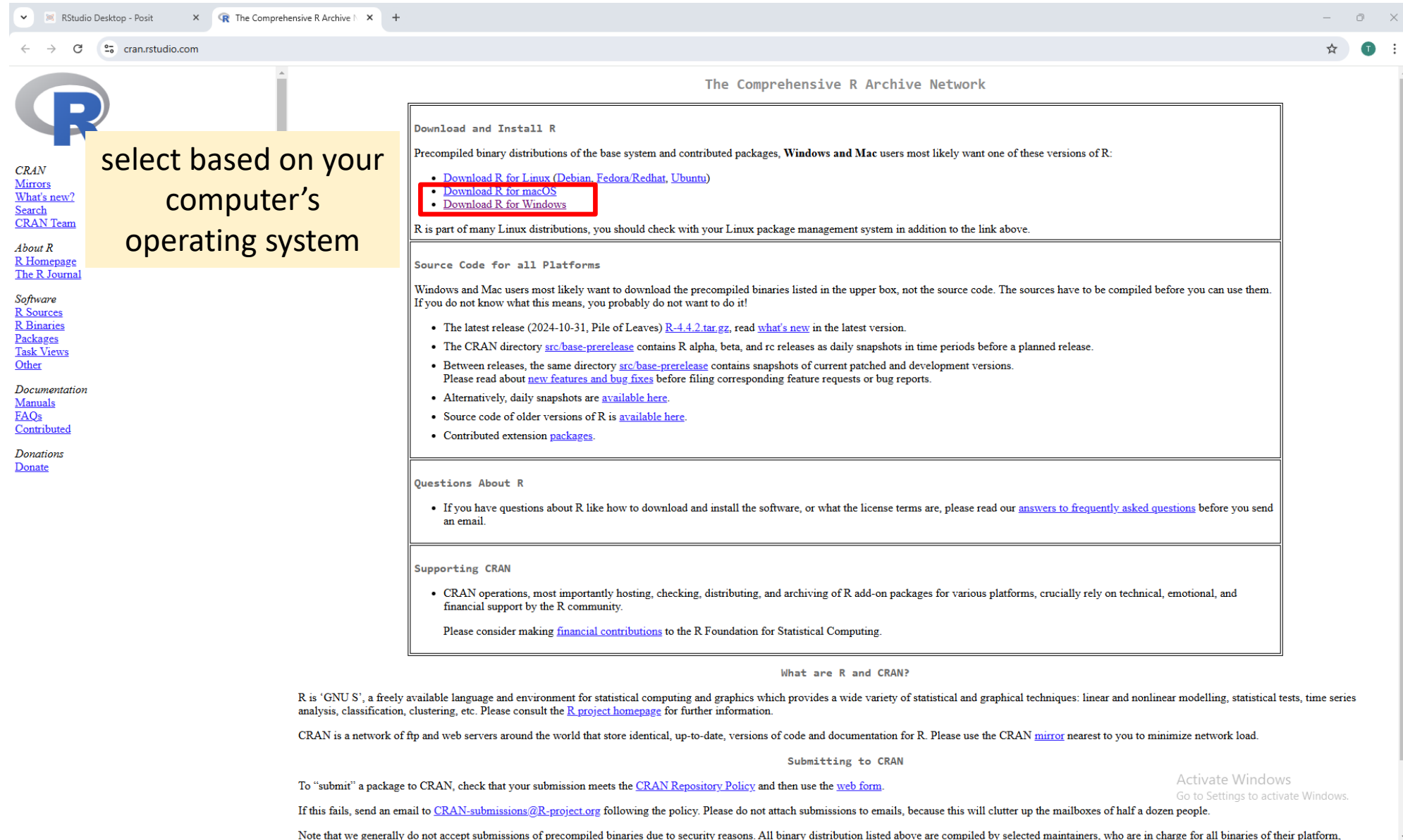
Size: 265.27 MB | [SHA-256: 5EFCD188](#) | Version: 2024.12.0+467 | Released: 2024-12-16

First: install R

RStudio is an additional program that makes using R easier

Activate Windows
Go to Settings to activate Windows.

Download R: Windows or Mac



The screenshot shows the CRAN website with a yellow callout box that says "select based on your computer's operating system". The callout box points to the download links for Windows and macOS, which are highlighted with a red rectangle. The website content includes sections for downloading and installing R, source code for all platforms, questions about R, and supporting CRAN.

select based on your computer's operating system

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 \(Debian, Fedora/Redhat, Ubuntu\)](#)
- [Download R for macOS](#)
- [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 (2024-10-31, Pile of Leaves) [R-4.4.2.tar.gz](#), read [what's new](#) in the latest version.
- The CRAN directory [src/base-prerelease](#) contains R alpha, beta, and rc releases as daily snapshots in time periods before a planned release.
- Between releases, the same directory [src/base-prerelease](#) contains snapshots of current patched and development versions. Please read about [new features and bug fixes](#) before filing corresponding feature requests or bug reports.
- Alternatively, daily snapshots are [available here](#).
- 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.

Supporting CRAN

- CRAN operations, most importantly hosting, checking, distributing, and archiving of R add-on packages for various platforms, crucially rely on technical, emotional, and financial support by the R community.

Please consider making [financial contributions](#) to the R Foundation for Statistical Computing.

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, send an email to 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,

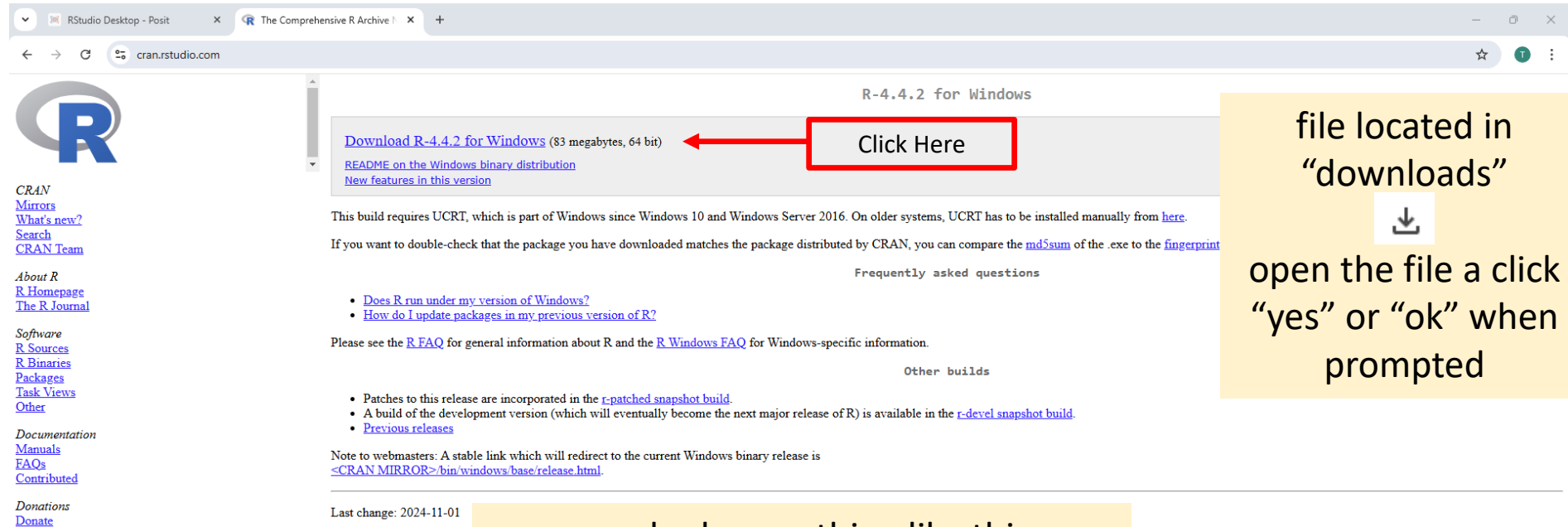
Activate Windows
Go to Settings to activate Windows.

Download R: I have a Windows operating system

The screenshot shows the CRAN website (cran.rstudio.com) in a web browser. The browser tabs include 'RStudio Desktop - Posit' and 'The Comprehensive R Archive'. The address bar shows 'cran.rstudio.com'. The website layout includes a sidebar on the left with links for CRAN, Mirrors, What's new?, Search, CRAN Team, About R, R Homepage, The R Journal, Software, R Sources, R Binaries, Packages, Task Views, Other, Documentation, Manuals, FAQs, Contributed, Donations, and Donate. The main content area features a 'Subdirectories:' section with links for 'base', 'contrib', 'old contrib', and 'Rtools'. A red box highlights the 'R for Windows' link, and a red arrow points to it with the text 'Click Here'. Below the links, there is text explaining the binaries for base distribution, contributed CRAN packages, and tools to build R and R packages. A note at the bottom states: 'Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.'

should be similar for
Mac

Download R



R-4.4.2 for Windows

[Download R-4.4.2 for Windows](#) (83 megabytes, 64 bit) **Click Here**

[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](#)

Frequently asked questions

- [Does R run under my version of Windows?](#)
- [How do I update packages in my previous version of 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](#).

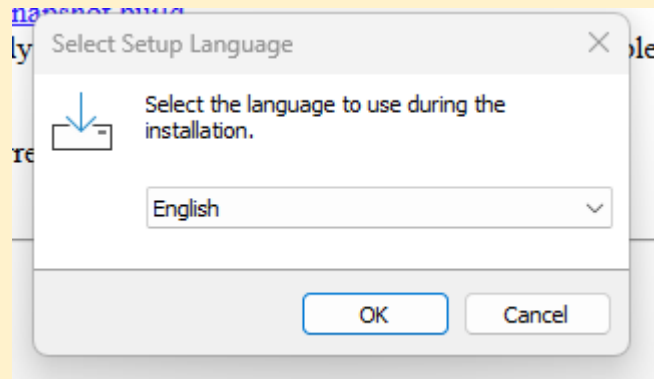
Last change: 2024-11-01

file located in
“downloads”



open the file a click
“yes” or “ok” when
prompted

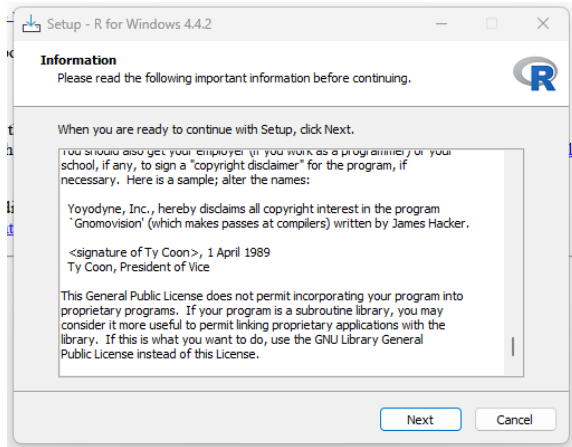
may look something like this



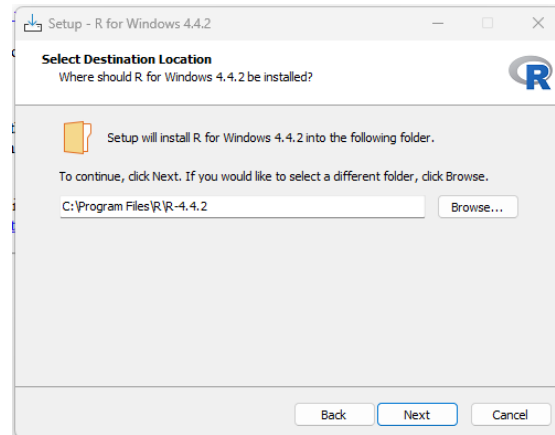
Activate Windows
Go to Settings to activate Windows.

Download R

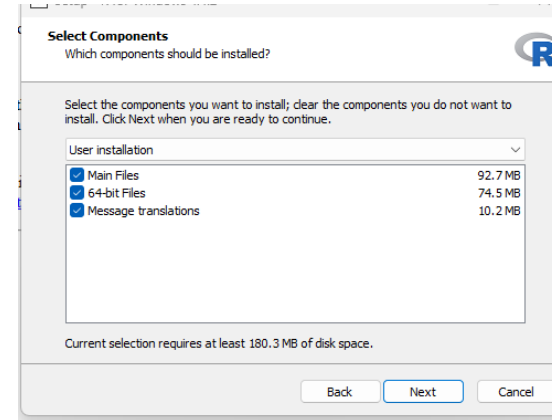
1. Click “Next”



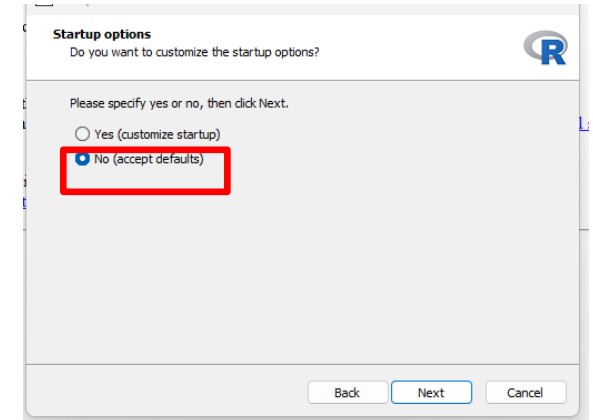
2. Click “Next”



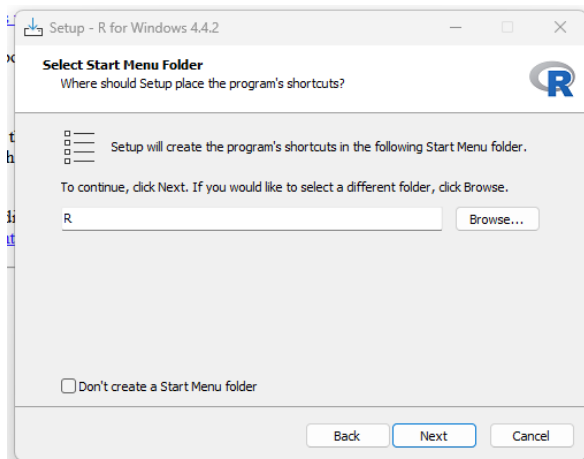
3. Click “Next”



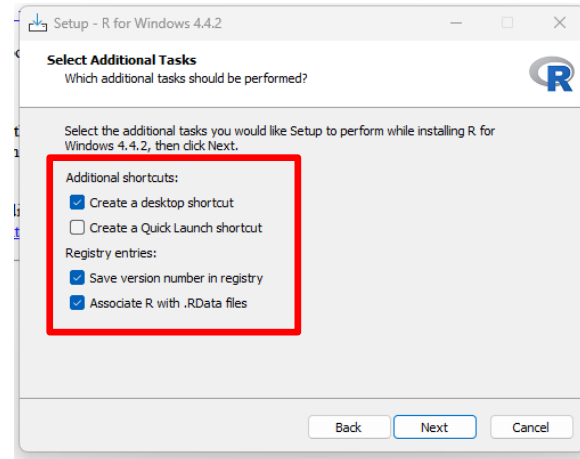
4. Click “Next”



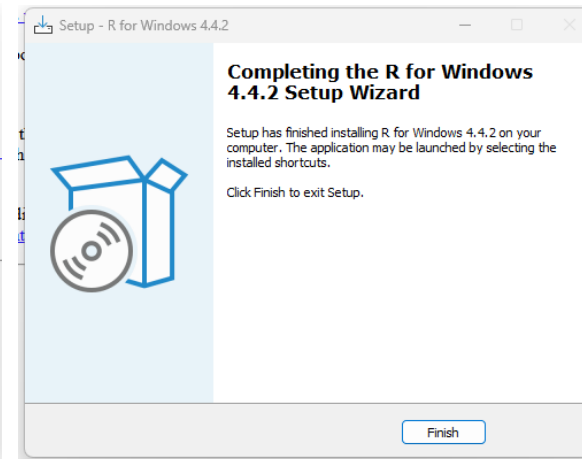
5. Click “Next”



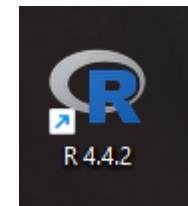
6. Click “Next”



7. Click “Finish”



R icon should now appear on desktop



After successfully installing R

- click on the same link again to download and install RStudio
 - see next slides, with link provided there again

Download RStudio

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

The screenshot shows the RStudio Desktop download page. The page has a navigation bar with links: PRODUCTS, OPEN SOURCE, USE CASES, PARTNERS, LEARN & SUPPORT, and ABOUT. The main heading is "RStudio Desktop". Below it, a paragraph states: "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." Another paragraph says: "Don't want to download or install anything? Get started with RStudio on [Posit Cloud for free](#). If you're a professional data scientist looking to download RStudio and also need common enterprise features, don't hesitate to [book a call with us](#)." A third paragraph says: "Want to learn about core or advanced workflows in RStudio? Explore the [RStudio User Guide](#) or the [Getting Started](#) section."

There are two main sections for installation:

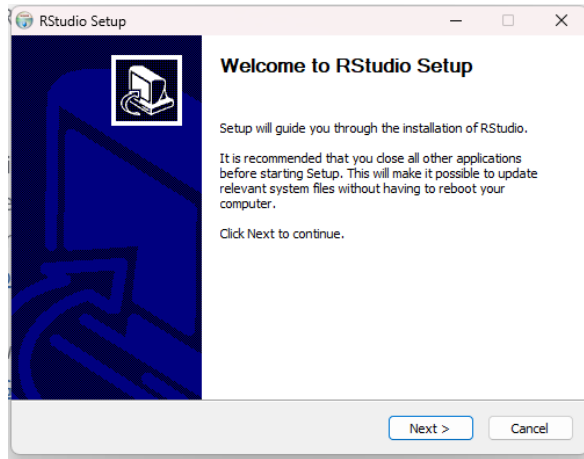
- 1: Install R**
RStudio requires R 3.6.0+. Choose a version of R that matches your computer's operating system.
R is not a Posit product. By clicking on the link below to download and install R, you are leaving the Posit website. Posit disclaims any obligations and all liability with respect to R and the R website.
A blue button labeled "DOWNLOAD AND INSTALL R" is at the bottom.
- 2: Install RStudio**
A blue button labeled "DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS" is present.
Below the button, it says: "Size: 265.27 MB | [SHA-256: 5EFC188](#) | Version: 2024.12.0+467 | Released: 2024-12-16"

Annotations on the page:

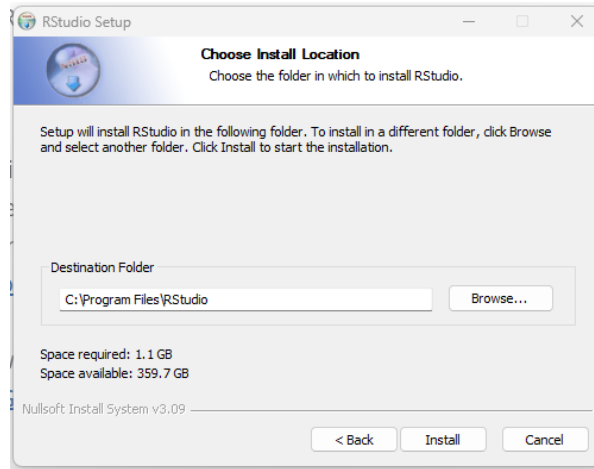
- A yellow box at the top right says: "After install R, then Install RStudio". A red arrow points from this box to the "DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS" button.
- A yellow box on the right side says: "file located in 'downloads'", followed by a download icon and "open the file a click 'yes' or 'ok' when prompted".
- A yellow box at the bottom right says: "scroll down to select another operating system if needed".

Download RStudio

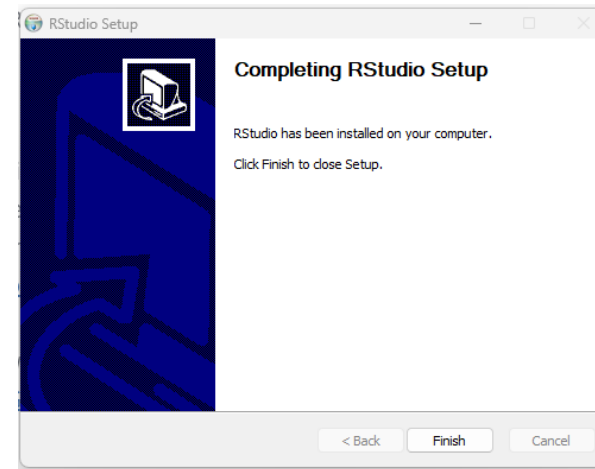
1. Click “Next”



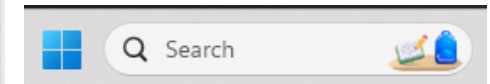
2. Click “Install”



3. Click “Finish”

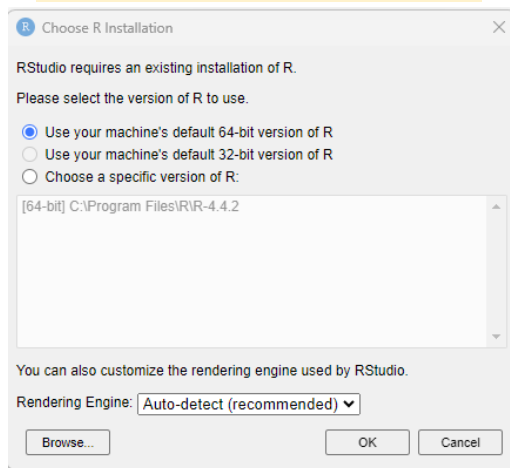


4. Open App



Search Rstudio to
locate, or find in recent
downloads

5. Click “OK”



Create a shortcut to RStudio, if desired

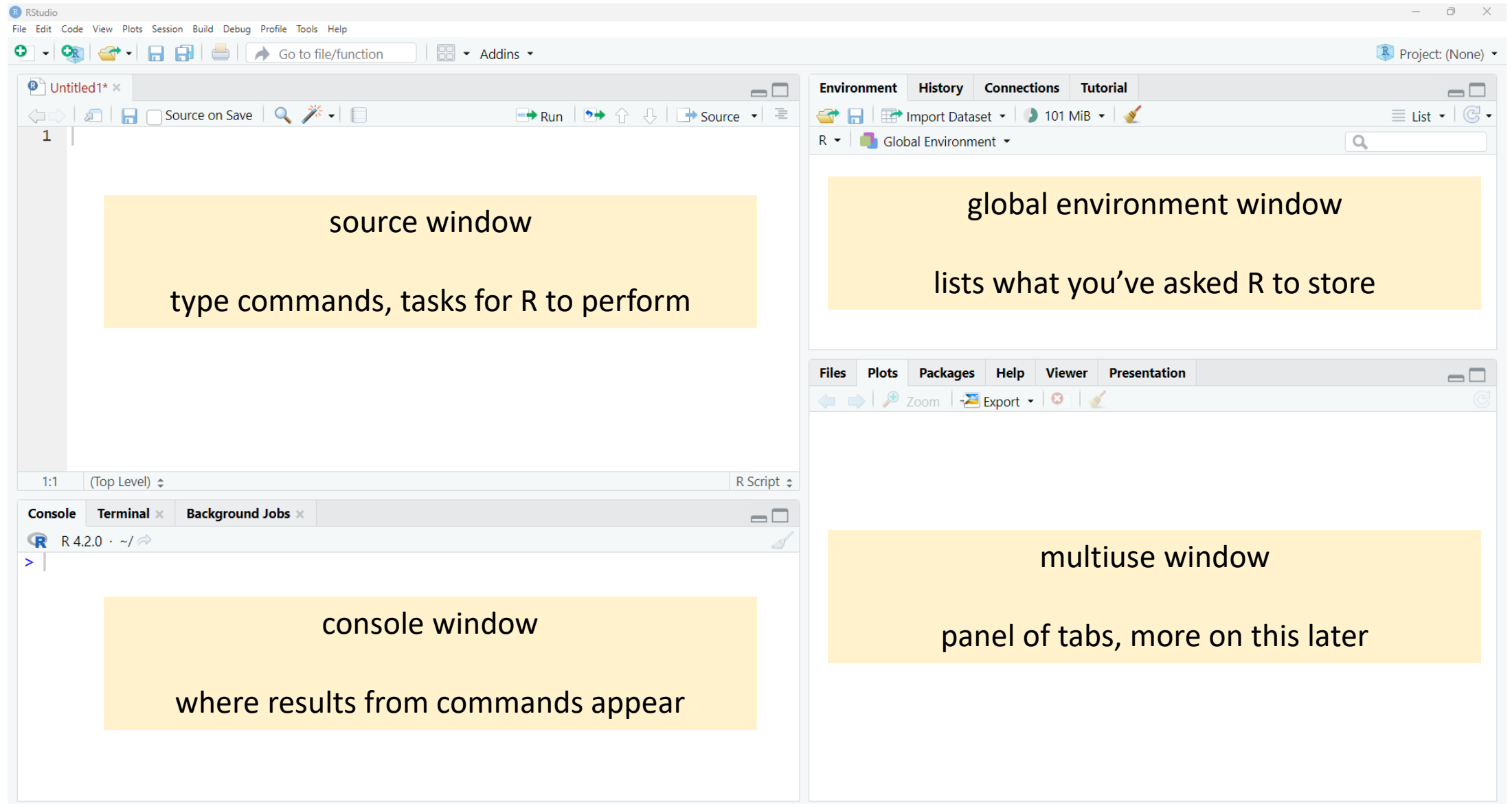
Keep R on your computer, but no need to open

Many YouTube instructional videos if you have any
trouble. Find what makes sense to you.
Also, ask me or your peers.

Open RStudio

- and try the following examples...
 - see next slides


R studio, interface



How to run commands

The screenshot displays the RStudio environment with a yellow instructional box in the source editor and the console output.

Source Editor: A yellow box contains the following instructions:

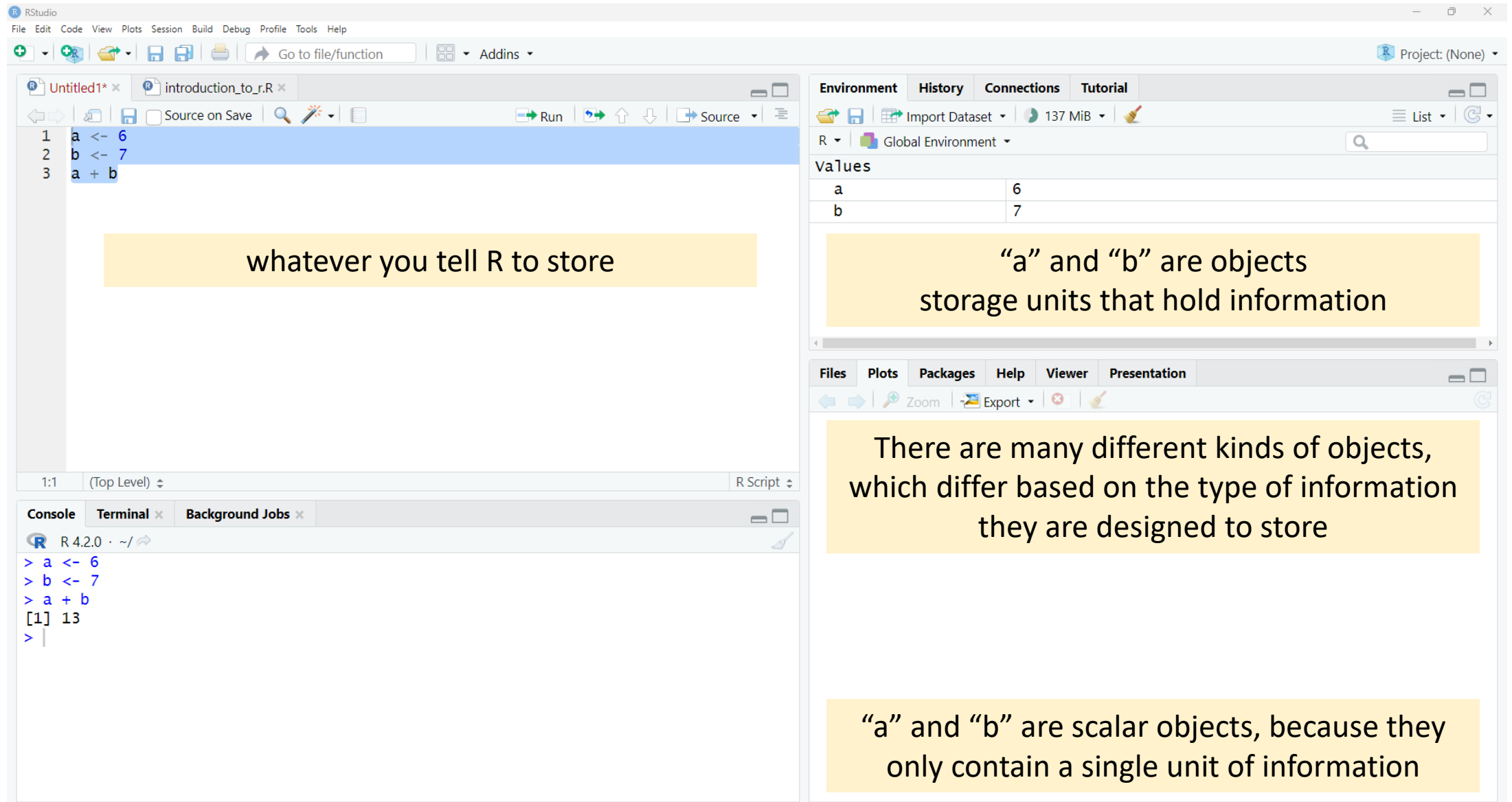
- (1) type commands here
- (2) highlight desired command(s)
- (3) point and click  **Run** , or “Ctrl” + “Enter” on keyboard

Console: The command `> 6 + 7` has been executed, resulting in the output `[1] 13`.

Environment Panel: The Environment panel on the right shows "Global Environment" and states "Environment is empty".

Bottom Panel: A yellow box at the bottom of the console area contains the text "see results here".

What's in your environment?



The screenshot displays the RStudio environment with the following components:

- Source Editor:** Contains three lines of R code:

```
1 a <- 6
2 b <- 7
3 a + b
```
- Console:** Shows the execution of the code:

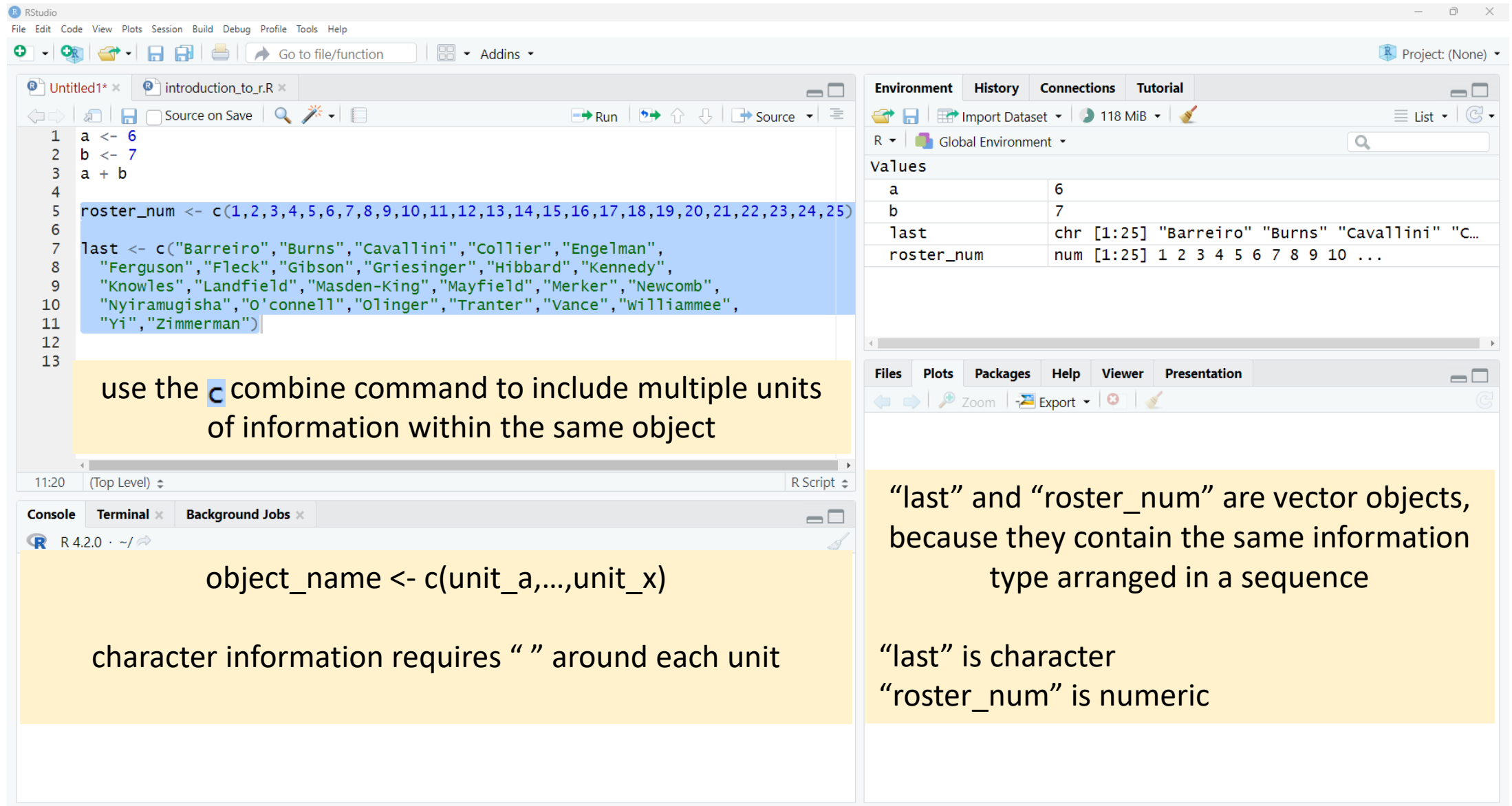
```
> a <- 6
> b <- 7
> a + b
[1] 13
>
```
- Environment Pane:** Displays the current environment with the following table:

Values	
a	6
b	7

Annotations explaining the objects in the environment:

- Source Editor:** whatever you tell R to store
- Environment Pane:** "a" and "b" are objects storage units that hold information
- Environment Pane:** There are many different kinds of objects, which differ based on the type of information they are designed to store
- Environment Pane:** "a" and "b" are scalar objects, because they only contain a single unit of information

Generate objects



The screenshot shows the RStudio interface. The source editor on the left contains the following R code:

```
1 a <- 6
2 b <- 7
3 a + b
4
5 roster_num <- c(1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25)
6
7 last <- c("Barreiro","Burns","Cavallini","Collier","Engelman",
8 "Ferguson","Fleck","Gibson","Griesinger","Hibbard","Kennedy",
9 "Knowles","Landfield","Masden-King","Mayfield","Merker","Newcomb",
10 "Nyiramugisha","O'connell","Olinger","Tranter","Vance","Williammee",
11 "Yi","Zimmerman")
12
13
```

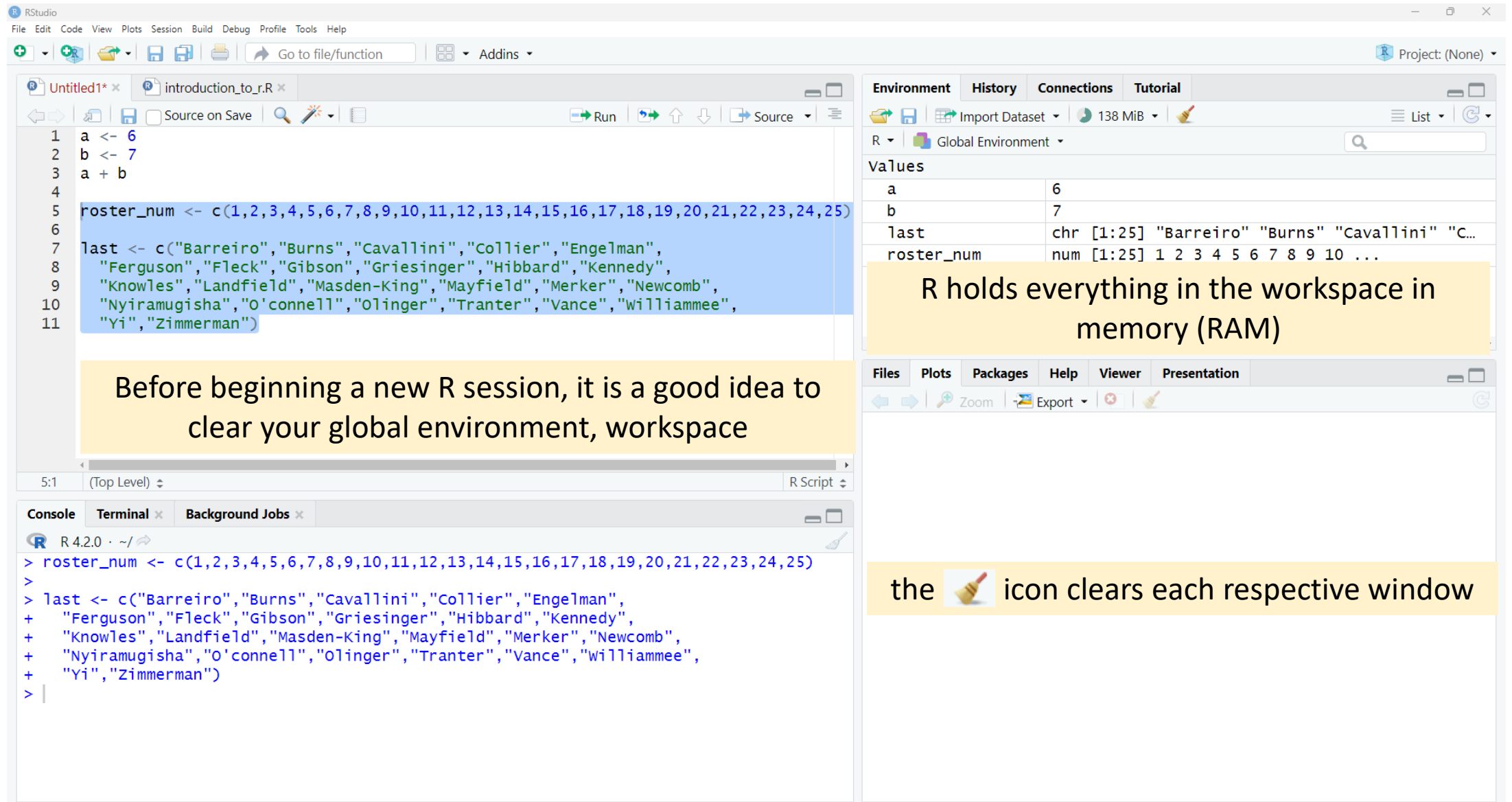
The Environment pane on the right shows the following objects:

Object	Value
a	6
b	7
last	chr [1:25] "Barreiro" "Burns" "Cavallini" "C..."
roster_num	num [1:25] 1 2 3 4 5 6 7 8 9 10 ...


Annotations in the image provide additional context:

- use the `c` combine command to include multiple units of information within the same object
- object_name <- c(unit_a,...,unit_x)
- character information requires " " around each unit
- "last" and "roster_num" are vector objects, because they contain the same information type arranged in a sequence
- "last" is character
- "roster_num" is numeric

Clearing your global environment & interface



The screenshot displays the RStudio interface with the following components:

- Source Editor:** Contains R code for creating variables `a`, `b`, and a vector `roster_num` of 25 names. Lines 5-11 are highlighted in blue.
- Environment Panel:** Shows the current workspace with variables `a` (value 6), `b` (value 7), `last` (a character vector of 25 names), and `roster_num` (a numeric vector of 25 values from 1 to 25). A yellow box highlights the text: "R holds everything in the workspace in memory (RAM)".
- Console:** Shows the execution of the code from the source editor. A yellow box highlights the text: "Before beginning a new R session, it is a good idea to clear your global environment, workspace".
- Buttons:** A yellow box highlights the text: "the  icon clears each respective window".

Try working with some existing data

- the following example is based on an Excel file
 - available on our Canvas page

▼ R + RStudio instructions and tutorial

 0_RStudio_PPT_SOC303.pptx

 Excel file for tutorial example in PPT

Click Here

that should take you to a window that looks like this

Class_Data_S2025.xlsx

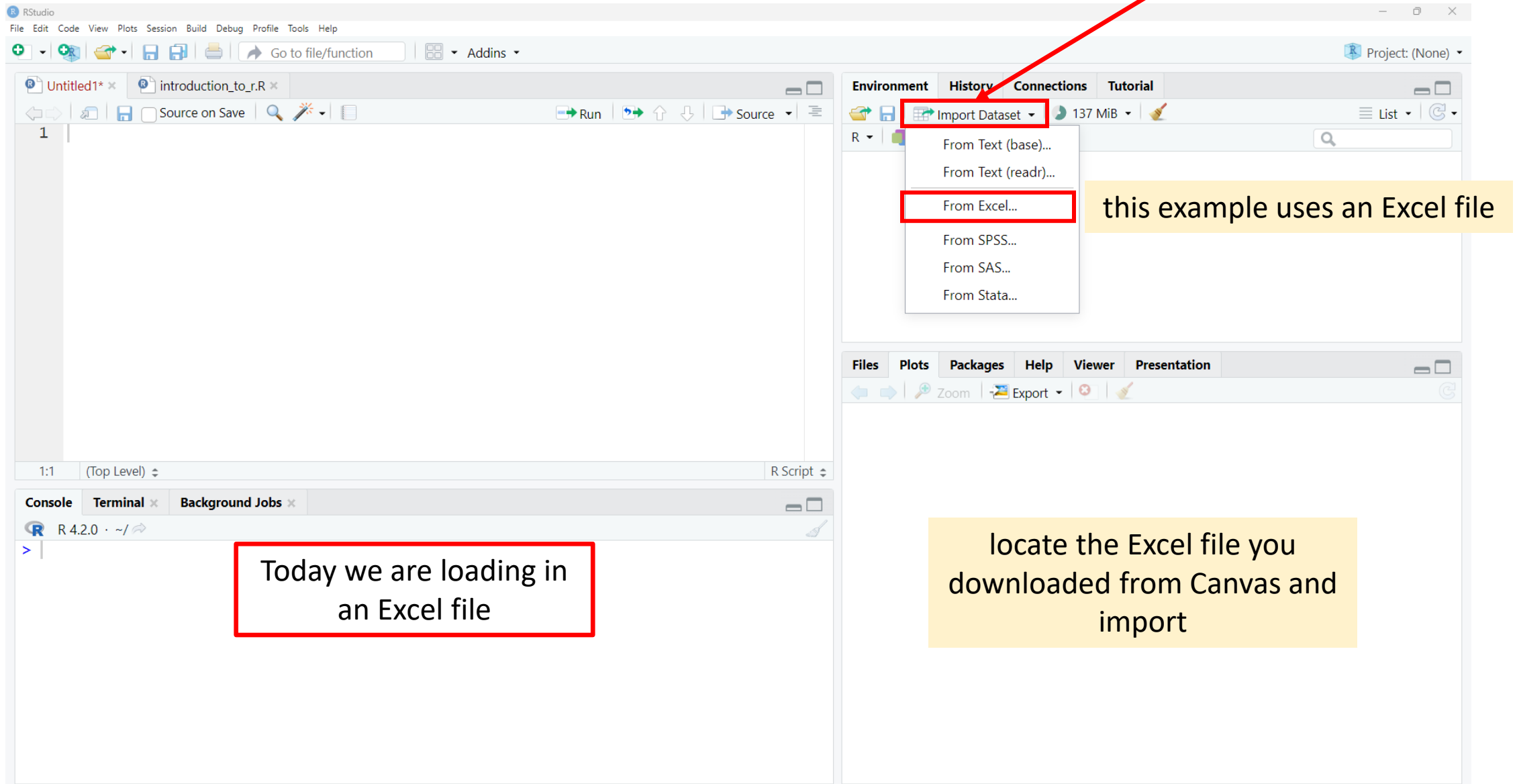
[Download Class_Data_S2025.xlsx](#) (10.9 KB)

Click Here

download and save in location you know how to access

🔄 - ZOOM + ↗

Loading data into R



The screenshot shows the RStudio interface. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. The toolbar contains icons for creating a new file, opening a file, saving, and running code. The main editor window shows a script titled 'introduction_to_r.R' with a single line of code: '1'. The right-hand pane has tabs for Environment, History, Connections, and Tutorial. The 'History' tab is active, showing a list of operations. A red box highlights the 'Import Dataset' button in the History tab, with a red arrow pointing to it from a text box that says 'click here'. A dropdown menu is open below the 'Import Dataset' button, listing several options: 'From Text (base)...', 'From Text (readr)...', 'From Excel...', 'From SPSS...', 'From SAS...', and 'From Stata...'. The 'From Excel...' option is highlighted with a red box. A yellow text box to the right of the dropdown menu says 'this example uses an Excel file'. The bottom pane has tabs for Files, Plots, Packages, Help, Viewer, and Presentation. The 'Files' tab is active, showing a list of files. A yellow text box at the bottom right says 'locate the Excel file you downloaded from Canvas and import'. The bottom status bar shows 'R 4.2.0 · ~/...'.

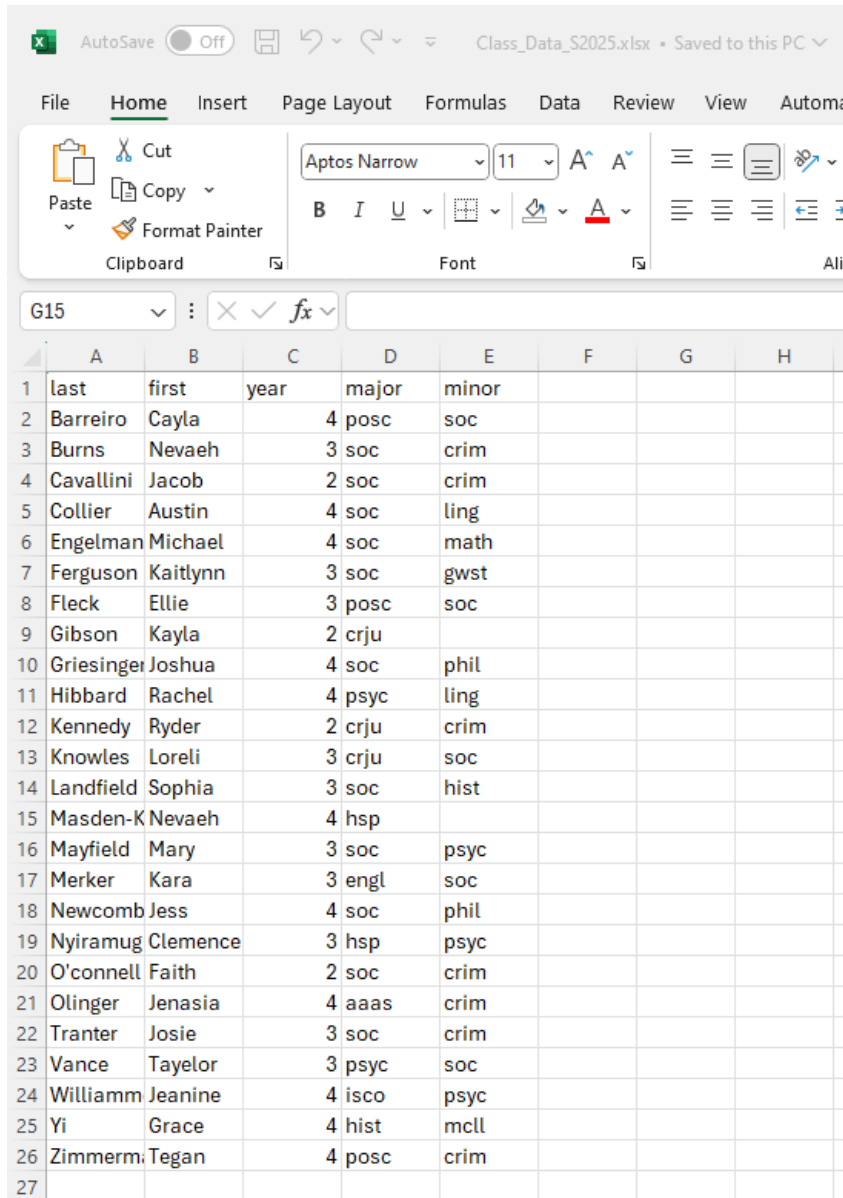
click here

this example uses an Excel file

locate the Excel file you downloaded from Canvas and import

Today we are loading in an Excel file

Excel file: standard dataset structure



Excel file: standard dataset structure

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	last	first	year	major	minor			
2	Barreiro	Cayla		4 posc	soc			
3	Burns	Nevaeh		3 soc	crim			
4	Cavallini	Jacob		2 soc	crim			
5	Collier	Austin		4 soc	ling			
6	Engelman	Michael		4 soc	math			
7	Ferguson	Kaitlynn		3 soc	gwst			
8	Fleck	Ellie		3 posc	soc			
9	Gibson	Kayla		2 crju				
10	Griesinger	Joshua		4 soc	phil			
11	Hibbard	Rachel		4 psyc	ling			
12	Kennedy	Ryder		2 crju	crim			
13	Knowles	Loreli		3 crju	soc			
14	Landfield	Sophia		3 soc	hist			
15	Masden-K	Nevaeh		4 hsp				
16	Mayfield	Mary		3 soc	psyc			
17	Merker	Kara		3 engl	soc			
18	Newcomb	Jess		4 soc	phil			
19	Nyiramug	Clemence		3 hsp	psyc			
20	O'connell	Faith		2 soc	crim			
21	Olinger	Jenasia		4 aaas	crim			
22	Tranter	Josie		3 soc	crim			
23	Vance	Taylor		3 psyc	soc			
24	Williamm	Jeanine		4 isco	psyc			
25	Yi	Grace		4 hist	mccl			
26	Zimmerm	Tegan		4 posc	crim			
27								

- first row contains variable names
 - R is case sensitive
- subsequent rows contain observations
- columns contain variable information
 - each data type is the same, respectively
- How many observations?
- How many variables?

Data viewer

see the new tab

The screenshot shows the RStudio interface with the Data Viewer tab active. The Data Viewer displays a table with 11 rows and 6 columns. The first column is labeled 'id' and contains numbers 1 through 11. The next two columns are 'last' and 'first', containing names. The next two columns are 'year' and 'major', containing numbers and major names. The final column is 'minor', containing minor names. The cell for the 8th row in the 'minor' column is highlighted with a red box and labeled 'NA = missing data empty cell in Excel'. The Global Environment window on the right shows the variable 'Class_Data_S2025' with 25 observations and 5 variables. The console at the bottom shows the R code used to load and view the data.

id	last	first	year	major	minor
1	Barreiro	Cayla	4	posc	soc
2	Burns	Nevaeh	3	soc	crim
3	Cavallini	Jacob	2	soc	crim
4	Collier	Austin	4	soc	ling
5	Engelman	Michael	4	soc	math
6	Ferguson	Kaitlynn	3	soc	gwst
7	Fleck	Ellie	3	posc	soc
8	Gibson	Kayla	2	crju	NA
9	Griesinger	Joshua	4	soc	phil
10	Hibbard	Rachel	4	psyc	ling
11	Kennedy	Ryder	2	crju	crim

Showing 1 to 12 of 25 entries, 5 total columns

```
R 4.2.0 · ~/> library(readxl)
> Class_Data_S2025 <- read_excel("E:/1_UK/2_Teaching/SOC303/Data/Class_Data_S2025.xlsx")
> View(Class_Data_S2025)
>
```

Environment History Connections Tutorial

Import Dataset 191 MiB

R Global Environment

Data

Class_Data_S2025 25 obs. of 5 variables

Files Plots Packages Help Viewer Presentation

Zoom Export

click icon in global environment window to see data viewer tab if closed

If you're feeling froggy

- find some RStudio tutorials on YouTube and try to follow along
 - the only way to learn is practice
- It's okay to not feel froggy
 - we will ease into RStudio in class
- It's also okay if you didn't make it this far
 - let me know if you are having any issues downloading and installing
 - we will work on using RStudio throughout the semester