
Lesson notes | Setting up R and RStudio

Created by the GRAPH Courses team

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This document serves as an accompaniment for a lesson found on <https://thegraphcourses.org>.

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Learning objective

1. You can access R and RStudio, either through RStudio.cloud or by downloading and installing these software to your computer.

Introduction

To start you off on your R journey, we'll need to set you up with the required software, R and RStudio. **R** is the programming language that you'll use write code, while **RStudio** is an integrated development environment (IDE) that makes working with R easier.

Working locally vs. on the cloud

There are two main ways that you can access and work with R and RStudio: download them to your computer, or use a web server to access them on the cloud.

Using R and RStudio on the cloud is the less common option, but it may be the right choice if you are just getting started with programming, and you do not yet want to worry about installing software. You may also prefer the cloud option if your local computer is old, slow, or otherwise unfit for running R.

Below, we go through the setup process for RStudio Cloud, Rstudio on Windows and RStudio on macOS separately. Jump to the section that is relevant for you!

WATCH OUT



WATCH OUT

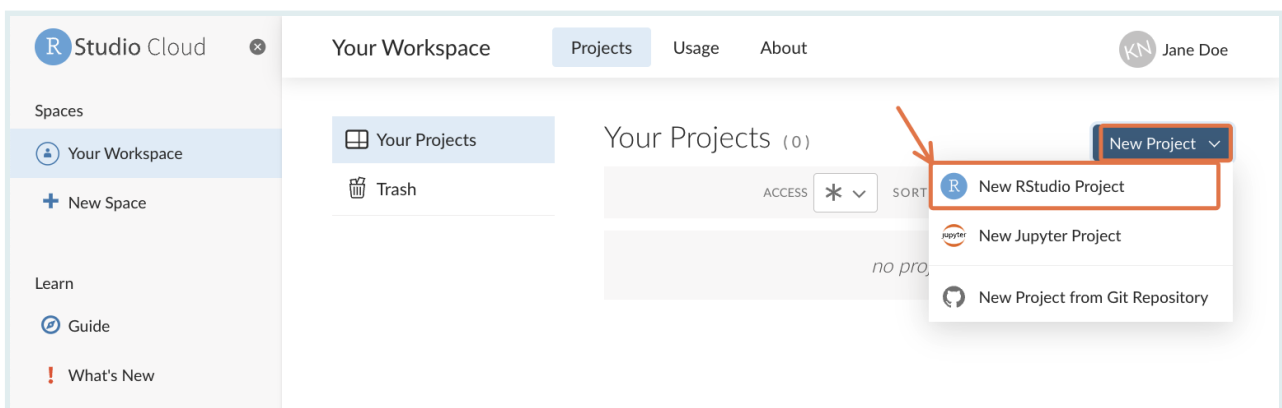


than 25 hours per month, you may want to avoid this option.

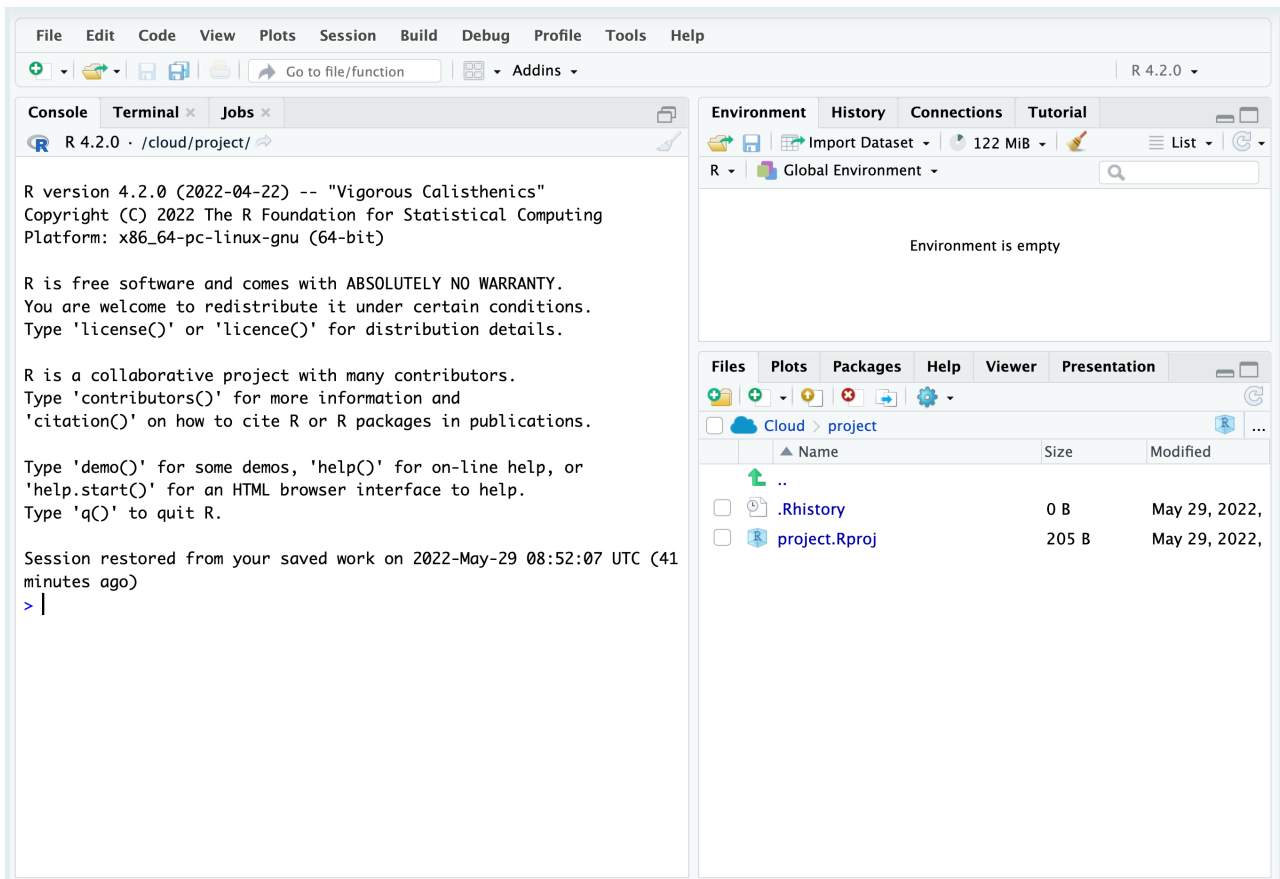
RStudio on the cloud

If you'll be working on the cloud, follow the steps below:

1. Go to the website rstudio.cloud and follow the instructions to sign up for a free account. (We recommend signing up with Google if you have a Google account, so you don't need to remember any new passwords).
2. Once you're done, click on the "New Project" icon at the top right, and select "New RStudio Project".

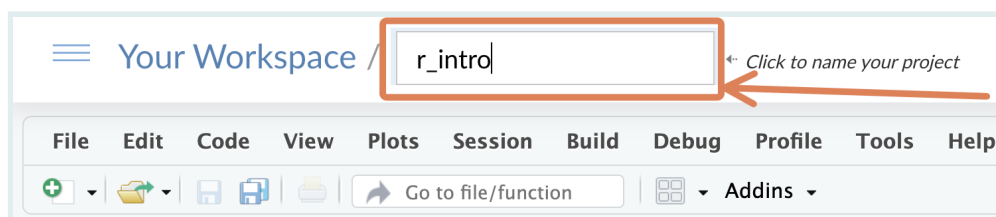


You should see a screen like this:



This is RStudio, your new home for a long time to come!

At the top of the screen, rename the project from “Untitled Project” to something like “r_intro”.



You can start using R by typing code into the “console” pane on the left:

```
R 4.2.0 · /cloud/project/

R version 4.2.0 (2022-04-22) -- "Vigorous Calisthenics"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

Session restored from your saved work on 2022-May-29 08:52:07 UTC (41
minutes ago)
> 2 + 2
```

Try using R as a calculator here; type `2 + 2` and press Enter.

That's it; you're ready to roll. Whenever you want to reopen RStudio, navigate to rstudio.cloud,

Proceed to the “wrapping up” section of the lesson.

Set up on Windows

Download and install R

If you're working on Windows, follow the steps below to download and install R:

1. Go to cran.rstudio.com to access the R installation page. Then click the download link for Windows:

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 \(Debian, Fedora/Redhat, Ubuntu\)](#)
- [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.

2. Choose the “base” sub-directory.

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 >= 3.4.x).
old contrib	Binaries of contributed CRAN packages for outdated versions of R (for R < 3.4.x).

3. Then click on the download link at the top of the page to download the latest version of R:

R-4.2.0 for Windows

[Download R-4.2.0 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](#).

Note that the screenshot above may not show the latest version.

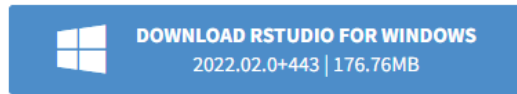
4. After the download is finished, click on the downloaded file, then follow the instructions on the installation pop-up window. During installation, you should not have to change any of the defaults; just keep clicking “Next” until the installation is done.

Well done! You should now have R on your computer. But you likely won’t ever need to interact with R directly. Instead you’ll use the RStudio IDE to work with R. Follow the instructions in the next section to get RStudio.

Download, install & run RStudio

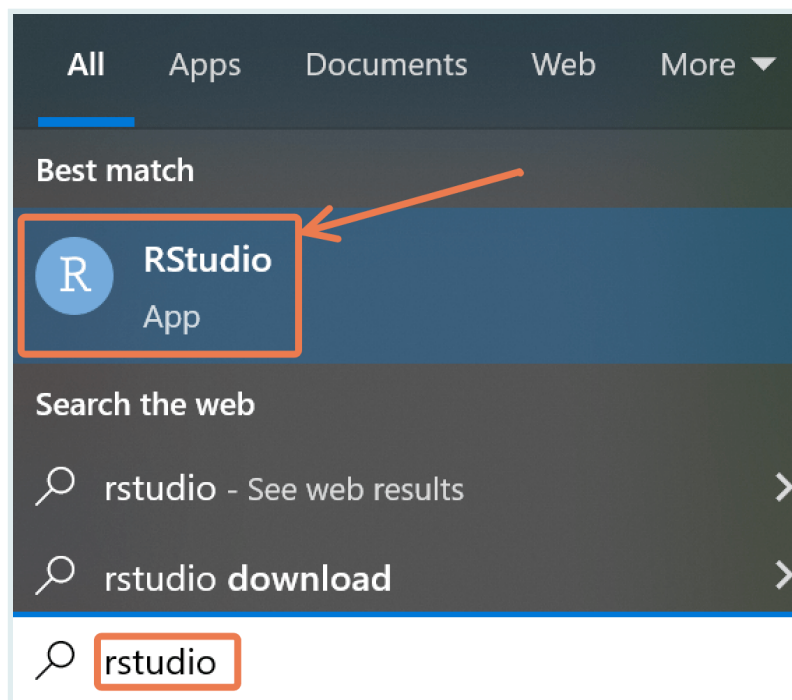
To download RStudio, go to rstudio.com/products/rstudio/download/#download and download the Windows version.

2. Download RStudio Desktop. Recommended for your system:

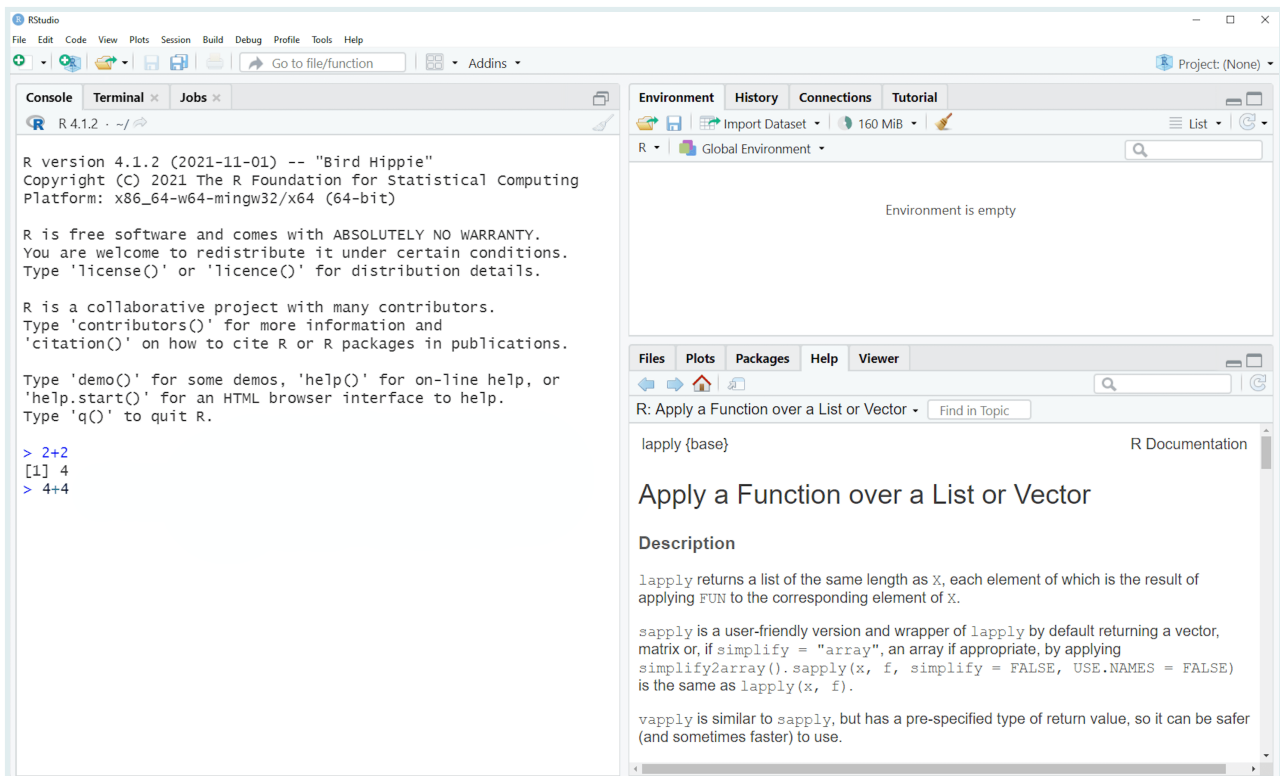


After the download is finished, click on the downloaded file and follow the installation instructions.

Once installed, RStudio can be opened like any application on your computer: press the Windows key to bring up the Start menu, and search for "rstudio". Click to open the app:

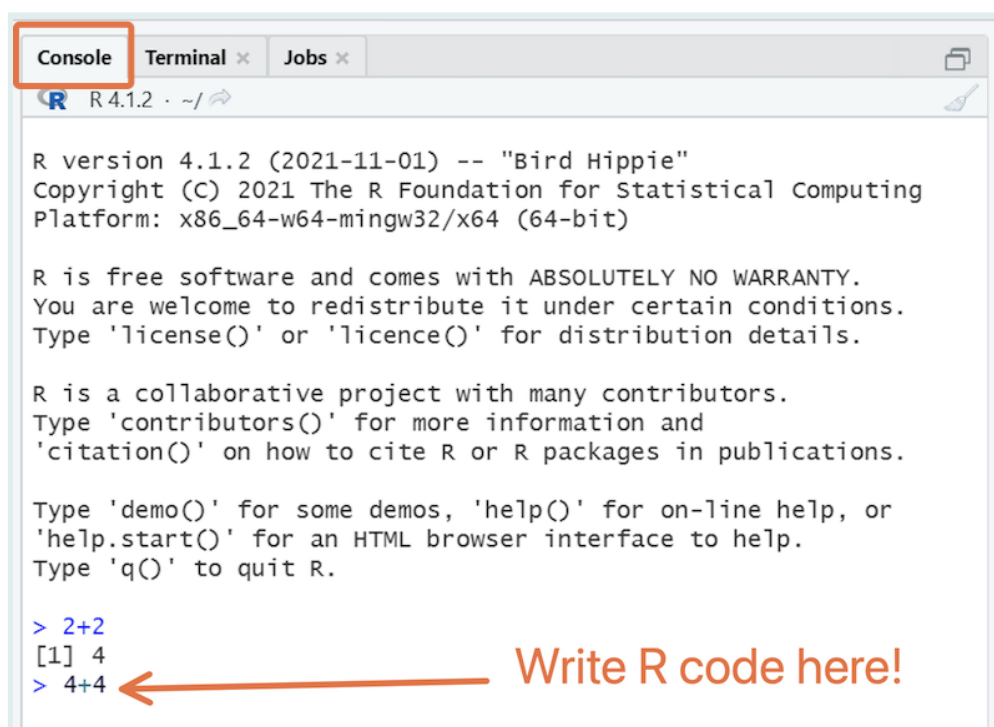


You should see a window like this:



This is RStudio, your new home for a long time to come!

You can start using R by typing code into the “console” pane on the left:



Try using R as a calculator here; type `2 + 2` and press Enter.

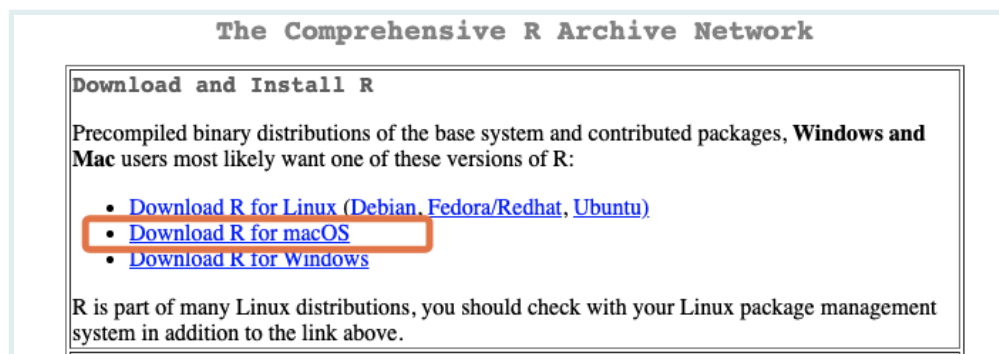
That's it; you're ready to roll. Proceed to the “wrapping up” section of the lesson.

Set up on macOS

Download and install R

If you're working on macOS, follow the steps below to download and install R:

1. Go to cran.rstudio.com to access the R installation page. Then click the link for macOS:



2. Download and install the relevant R version for your Mac. For most people, the first option under "Latest release" will be the one to get.

Latest release:

R-4.2.0.pkg (notarized and signed)
SHA1-hash: 2a90fb8629e44f72f9d89d6a9bac9b71564587d7
 (ca. 90MB) for Intel Macs

Latest version for Intel Macs

R 4.2.0 binary for macOS 10.13 (**High Sierra**) and higher, **Intel 64-bit** build, signed and notarized package. Contains R 4.2.0 framework, R.app GUI 1.78 in 64-bit for Intel Macs, Tcl/Tk 8.6.6 X11 libraries and Texinfo 6.7. 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 (version 2.7.11 or later) since it is no longer part of macOS. Always re-install XQuartz when upgrading your macOS to a new major version.

This release supports Intel Macs, but it is also known to work using Rosetta2 on M1-based Macs. For native Apple silicon arm64 binary see below.

Important: this release uses Xcode 12.4 and GNU Fortran 8.2. If you wish to compile R packages from sources, you may need to download GNU Fortran 8.2 - see the [tools](#) directory.

R-4.2.0-arm64.pkg (notarized and signed)
SHA1-hash: ada2602d245164d316967d24f5482b58e2dfddff
 (ca. 89MB) for M1 Macs only!

Latest version for M1 Macs

R 4.2.0 binary for macOS 11 (**Big Sur**) and higher, **Apple silicon arm64** build, signed and notarized package. Contains R 4.2.0 framework, R.app GUI 1.78 for Apple silicon Macs (M1 and higher), Tcl/Tk 8.6.12 X11 libraries and Texinfo 6.8.

Important: this version does NOT work on older Intel-based Macs.

Note: the use of X11 (including `tcltk`) requires [XQuartz](#) (version 2.8.1 or later). Always re-install XQuartz when upgrading your macOS to a new major version.

This release uses Xcode 13.1 and experimental GNU Fortran 12 arm64 fork. If you wish to compile R packages which contain Fortran code, you may need to download GNU Fortran for arm64 from <https://mac.R-project.org/tools>. Any external libraries and tools are expected to live in `/opt/R/arm64` to not conflict with Intel-based software and this build will not use `/usr/local` to avoid such conflicts (see the [tools page](#) for more details).

[NEWS](#) (for Mac GUI)

[Mac-GUI-1.78.tar.gz](#)
SHA1-hash: 23b3c41b7eb771640fd504a75e5782792ddd8b2bc

Note: Previous R versions for El Capitan can be found in the [el-capitan/base](#) directory.

R-3.6.3.nn.pkg (signed)
SHA1-hash: c462c9b1f9b45d778f05b849aa25a9123b3557c4
 (ca. 77MB)

For older macs

Binaries for legacy OS X systems:

R 3.6.3 binary for OS X 10.11 (El Capitan) and higher, signed package. Contains R 3.6.3 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.

- After the download is finished, click on the downloaded file, then follow the instructions on the installation pop-up window.

Well done! You should now have R on your computer. But you likely won't ever need to interact with R directly. Instead you'll use the RStudio IDE to work with R. Follow the instructions in the next section to get RStudio.

Download, install & run RStudio

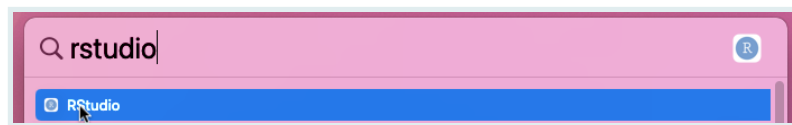
To download RStudio, go to rstudio.com/products/rstudio/download/#download and download the version for macOS.

2.
Download RStudio Desktop. Recommended for your system:

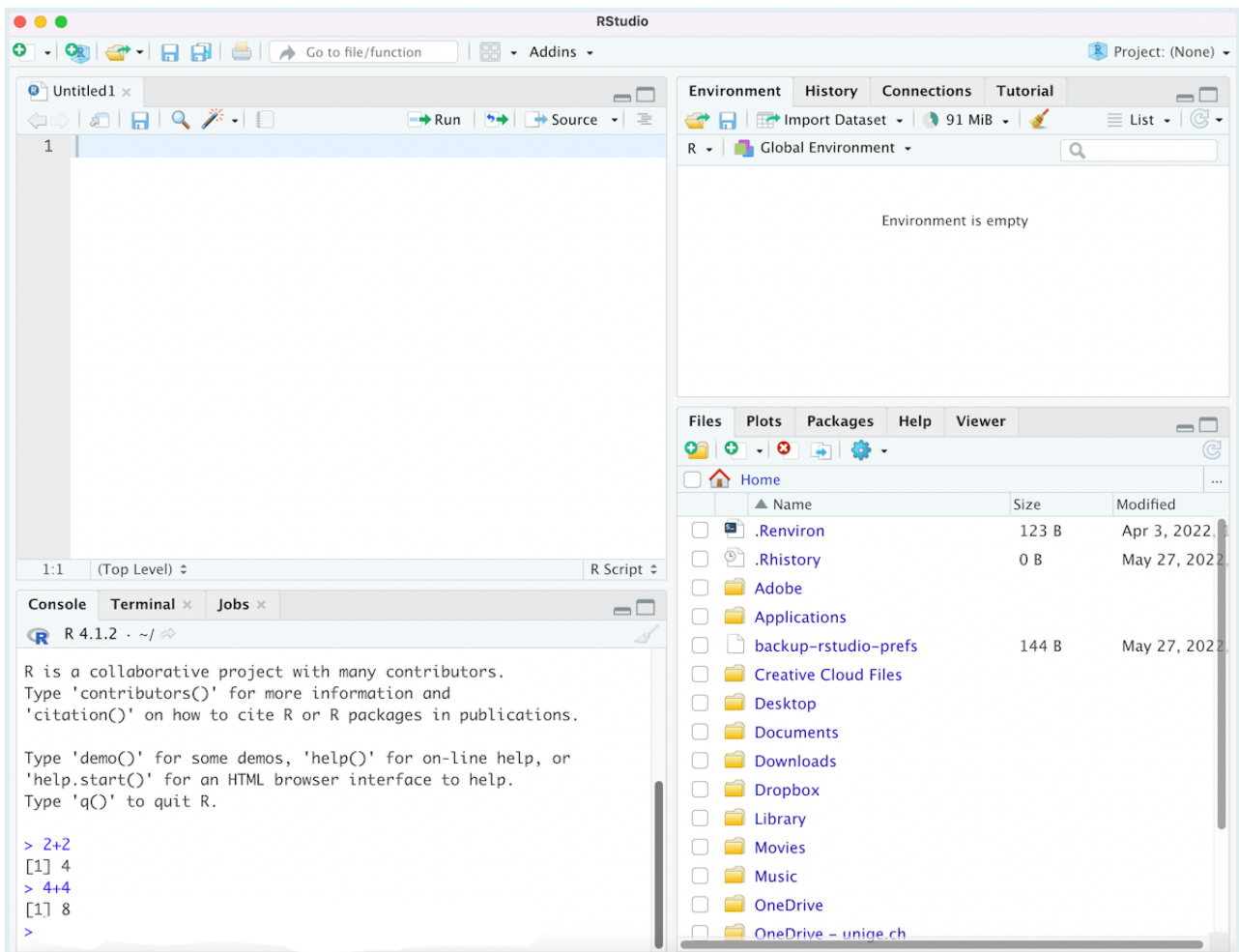
DOWNLOAD RSTUDIO FOR MAC
2022.02.0+443 | 217.18MB

After the download is finished, click on the downloaded file and follow the installation instructions.

Once installed, RStudio can be opened like any application on your computer: Press **Command + Space** to open Spotlight, then search for “rstudio”. Click to open the app.



You should see a window like this:



This is RStudio, your new home for a long time to come!

You can start using R by typing code into the “console” pane on the left:

```
R 4.1.2 ~/  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
> 2+2  
[1] 4  
> 4+4  
[1] 8  
>
```

Write code here

Try using R as a calculator here; type `2 + 2` and press Enter.

Wrap up

You should now have access to R and RStudio, so you're all set to begin the journey of learning to use these immensely powerful tools. See you in the next session!

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References

Some material in this lesson was adapted from the following sources:

- Nordmann, Emily, and Heather Cleland-Woods. *Chapter 2 Programming Basics | Data Skills*. *psyteachr.github.io*, <https://psyteachr.github.io/data-skills-v1/programming-basics.html> Accessed 23 Feb. 2022.

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