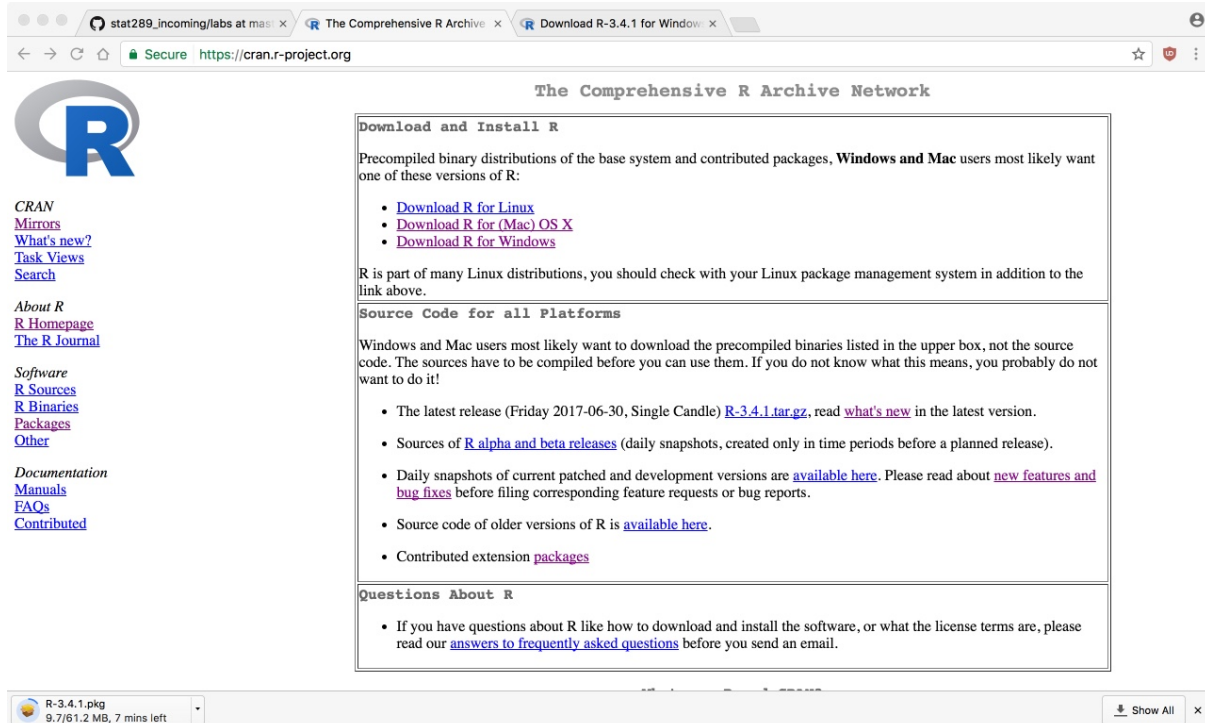


## Installing R and RStudio for OS and Windows

R is an open source programming language, meaning that you can install it for free on nearly any operating system. The steps here guide you through install the core R system, the RStudio IDE, and relevant R packages.

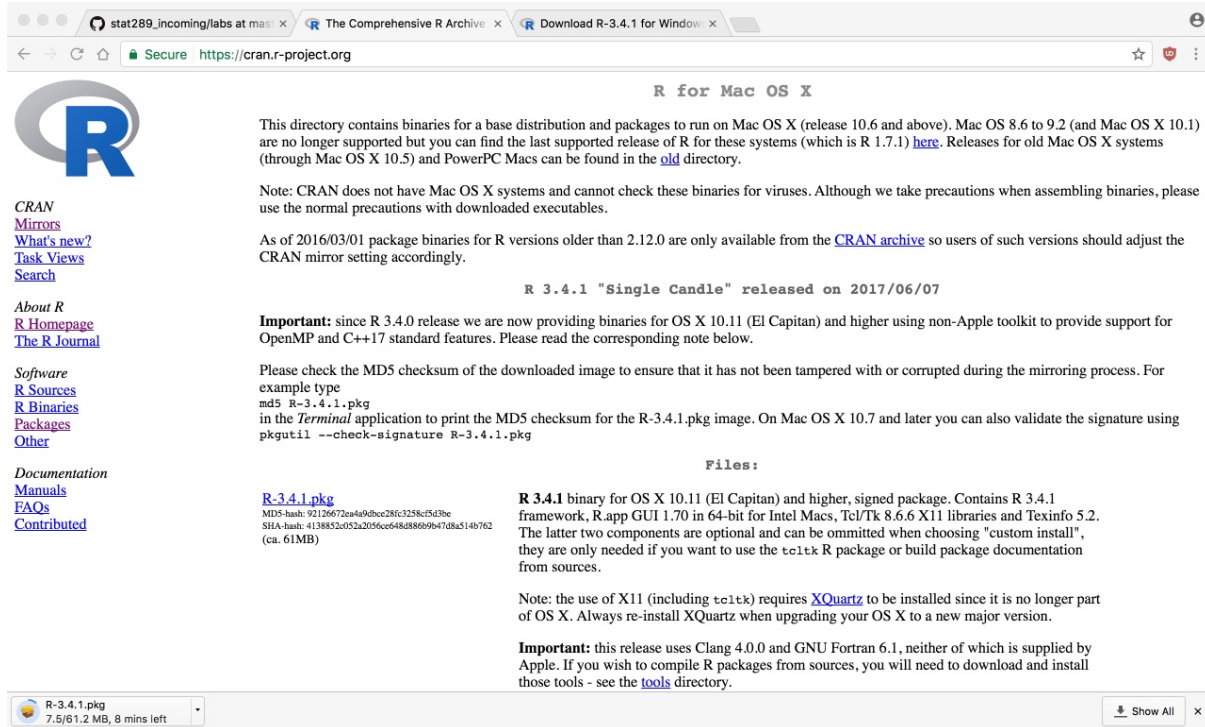
### Download R

The first step is to download the R programming language. To do this go to <https://cran.r-project.org/> and select your platform:



The screenshot shows the CRAN website in a web browser. The browser's address bar displays "Secure https://cran.r-project.org". The page title is "The Comprehensive R Archive Network". On the left side, there is a navigation menu with links: "CRAN", "Mirrors", "What's new?", "Task Views", "Search", "About R", "R Homepage", "The R Journal", "Software", "R Sources", "R Binaries", "Packages", "Other", "Documentation", "Manuals", "FAQs", and "Contributed". The main content area is titled "Download and Install R" and contains the following text: "Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:". Below this, there is a bulleted list of links: "Download R for Linux", "Download R for (Mac) OS X", and "Download R for Windows". Further down, it states: "R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above." The next section is "Source Code for all Platforms", which says: "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!". This is followed by a bulleted list: "The latest release (Friday 2017-06-30, Single Candle) [R-3.4.1.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](#).", and "Contributed extension [packages](#)". The final section is "Questions About R", which says: "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." At the bottom of the browser window, a download bar shows "R-3.4.1.pkg" with a size of "9.7/61.2 MB" and a time of "7 mins left".

For macOS, just download R-3.4.1 (or whatever is the most recent):



The screenshot shows a web browser window with the address bar displaying `https://cran.r-project.org`. The page title is "R for Mac OS X". On the left side, there is a navigation menu with links: "CRAN", "Mirrors", "What's new?", "Task Views", "Search", "About R", "R Homepage", "The R Journal", "Software", "R Sources", "R Binaries", "Packages", "Other", "Documentation", "Manuals", "FAQs", and "Contributed". The main content area contains the following text:

This directory contains binaries for a base distribution and packages to run on Mac OS X (release 10.6 and above). Mac OS 8.6 to 9.2 (and Mac OS X 10.1) are no longer supported but you can find the last supported release of R for these systems (which is R 1.7.1) [here](#). Releases for old Mac OS X systems (through Mac OS X 10.5) and PowerPC Macs can be found in the [old](#) directory.

Note: CRAN does not have Mac OS X systems and cannot check these binaries for viruses. Although we take precautions when assembling binaries, please use the normal precautions with downloaded executables.

As of 2016/03/01 package binaries for R versions older than 2.12.0 are only available from the [CRAN archive](#) so users of such versions should adjust the CRAN mirror setting accordingly.

R 3.4.1 "Single Candle" released on 2017/06/07

**Important:** since R 3.4.0 release we are now providing binaries for OS X 10.11 (El Capitan) and higher using non-Apple toolkit to provide support for OpenMP and C++17 standard features. Please read the corresponding note below.

Please check the MD5 checksum of the downloaded image to ensure that it has not been tampered with or corrupted during the mirroring process. For example type

```
md5 R-3.4.1.pkg
```

in the *Terminal* application to print the MD5 checksum for the R-3.4.1.pkg image. On Mac OS X 10.7 and later you can also validate the signature using

```
pkgutil --check-signature R-3.4.1.pkg
```

**Files:**

**R-3.4.1.pkg**  
MD5-hash: 92126672e4a9d8ce286c3258cf5d3be  
SHA1-hash: 4138852c052a2056ce648d8699647d8a514b762  
(ca. 61MB)

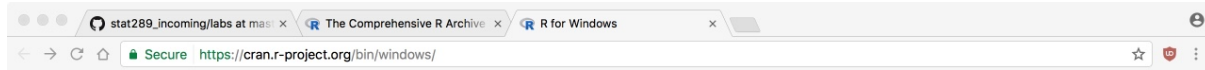
**R 3.4.1** binary for OS X 10.11 (El Capitan) and higher, signed package. Contains R 3.4.1 framework, R.app GUI 1.70 in 64-bit for Intel Macs, Tcl/Tk 8.6.6 X11 libraries and Texinfo 5.2. The latter two components are optional and can be omitted when choosing "custom install", they are only needed if 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 OS X to a new major version.

**Important:** this release uses Clang 4.0.0 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.

At the bottom of the page, there is a download progress bar showing "R-3.4.1.pkg" with a size of "7.5/61.2 MB" and "8 mins left". A "Show All" button is also visible.

## For Windows, first select base



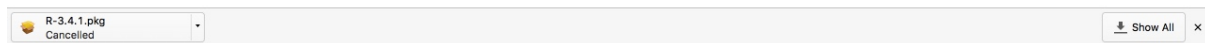
Subdirectories:

<a href="#">base</a>	Binaries for base distribution (managed by Duncan Murdoch). This is what you want to <a href="#">install R for the first time</a> .
<a href="#">contrib</a>	Binaries of contributed CRAN packages (for R >= 2.11.x; managed by Uwe Ligges). There is also information on <a href="#">third party software</a> available for CRAN Windows services and corresponding environment and make variables.
<a href="#">old contrib</a>	Binaries of contributed CRAN packages for outdated versions of R (for R < 2.11.x; managed by Uwe Ligges).
<a href="#">Rtools</a>	Tools to build R and R packages (managed by Duncan Murdoch). 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 Duncan Murdoch or 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.



## And then Download R 3.4.1



[Download R 3.4.1 for Windows](#) (62 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.

### 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?](#)

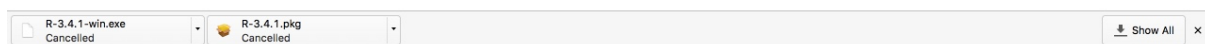
Please see the [R FAQ](#) for general information about R and the [R Windows FAQ](#) for Windows-specific information.

### 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.htm](#).

Last change: 2017-06-30, by Duncan Murdoch

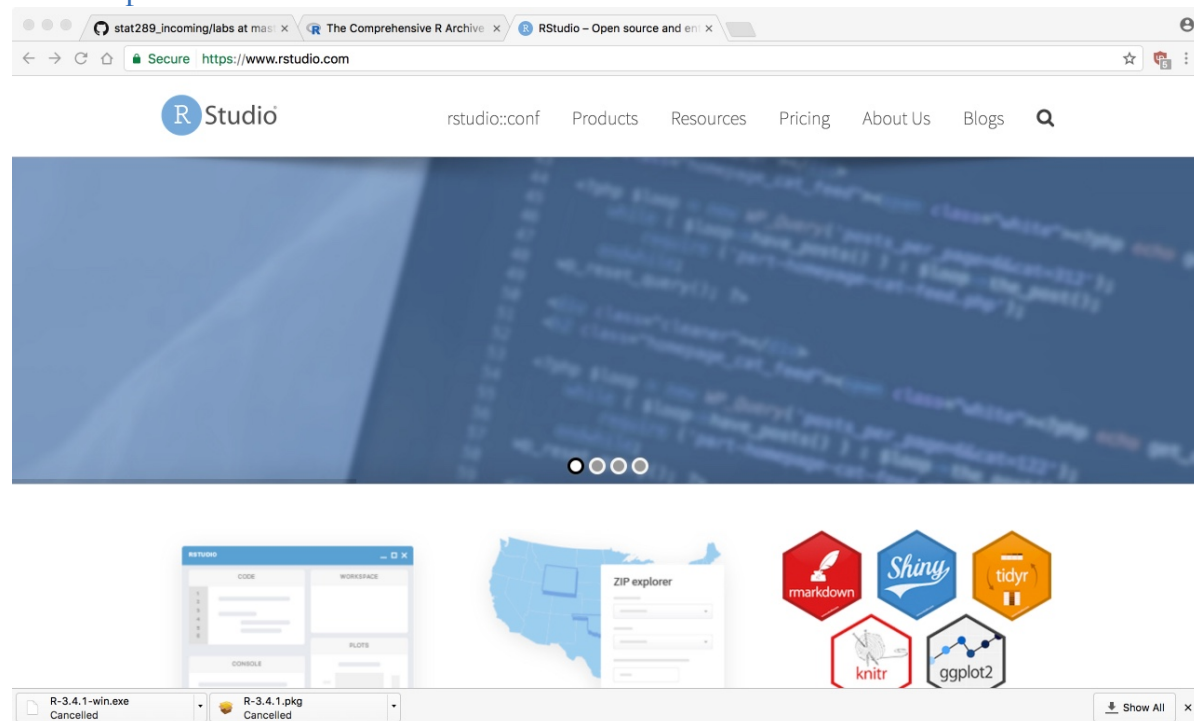


One you have the .pkg (macOS) or .exe (Windows) file, install this on your computer according to the default settings.

## Download RStudio

The files you just downloaded are the core R language files doing all the hard work of processing data. Next, we'll install integrated software that makes calling R easier.

Go to <https://www.rstudio.com/>. Click on Products => RStudio.

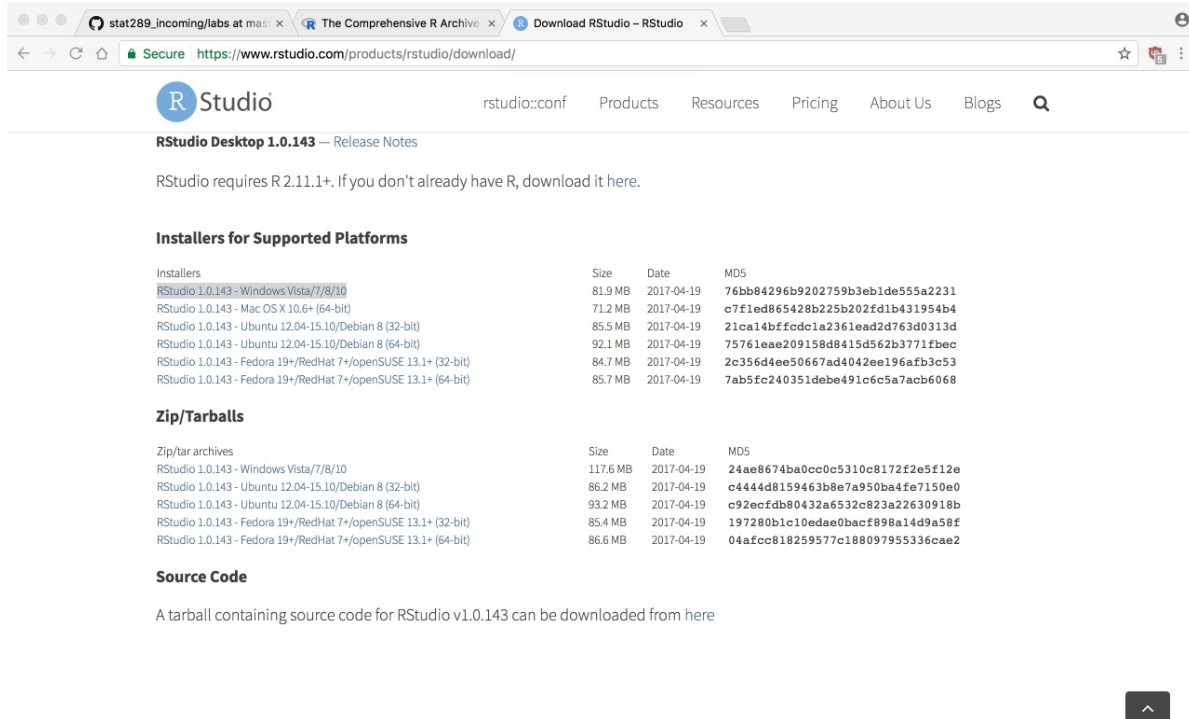


Scroll down to the **DOWNLOAD RSTUDIO DESKTOP** button and click on it.

A screenshot of the RStudio 'Products' page. The navigation bar is the same as the homepage. The 'Overview' section lists features: 'Access RStudio locally', 'Syntax highlighting, code completion, and smart indentation', 'Execute R code directly from the source editor', 'Quickly jump to function definitions', 'Easily manage multiple working directories using projects', 'Integrated R help and documentation', 'Interactive debugger to diagnose and fix errors quickly', and 'Extensive package development tools'. To the right, it states 'All of the features of open source, plus:' followed by 'A commercial license for organizations not able to use AGPL software' and 'Access to priority support'. Below this is a table with 'Support', 'License', and 'Pricing' rows. The 'Support' row shows 'Community forums only' and 'Priority Email Support' with an '8 hour response during business hours (ET)'. The 'License' row shows 'AGPL v3' and 'RStudio License Agreement'. The 'Pricing' row shows 'Free' and '\$995/year'. At the bottom are two buttons: 'DOWNLOAD RSTUDIO DESKTOP' and 'BUY NOW'.



Scroll down again to the **Installers for Supported Platforms**. The Windows link gives you an exe:



**RStudio Desktop 1.0.143** — Release Notes

RStudio requires R 2.11.1+. If you don't already have R, download it [here](#).

### Installers for Supported Platforms

Installers	Size	Date	MD5
<a href="#">RStudio 1.0.143 - Windows Vista/7/8/10</a>	81.9 MB	2017-04-19	76bb84296b9202759b3eb1de555a2231
<a href="#">RStudio 1.0.143 - Mac OS X 10.6+ (64-bit)</a>	71.2 MB	2017-04-19	c7f1ed865428b225b202fd1b431954b4
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (32-bit)</a>	85.5 MB	2017-04-19	21ca14bffc1a2361ead2d763d0313d
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (64-bit)</a>	92.1 MB	2017-04-19	75761eae209158d8415d562b3771fbec
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (32-bit)</a>	84.7 MB	2017-04-19	2c356d4ee50667ad4042ee196afb3c53
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (64-bit)</a>	85.7 MB	2017-04-19	7ab5fc240351debe491c6c5a7acb6068

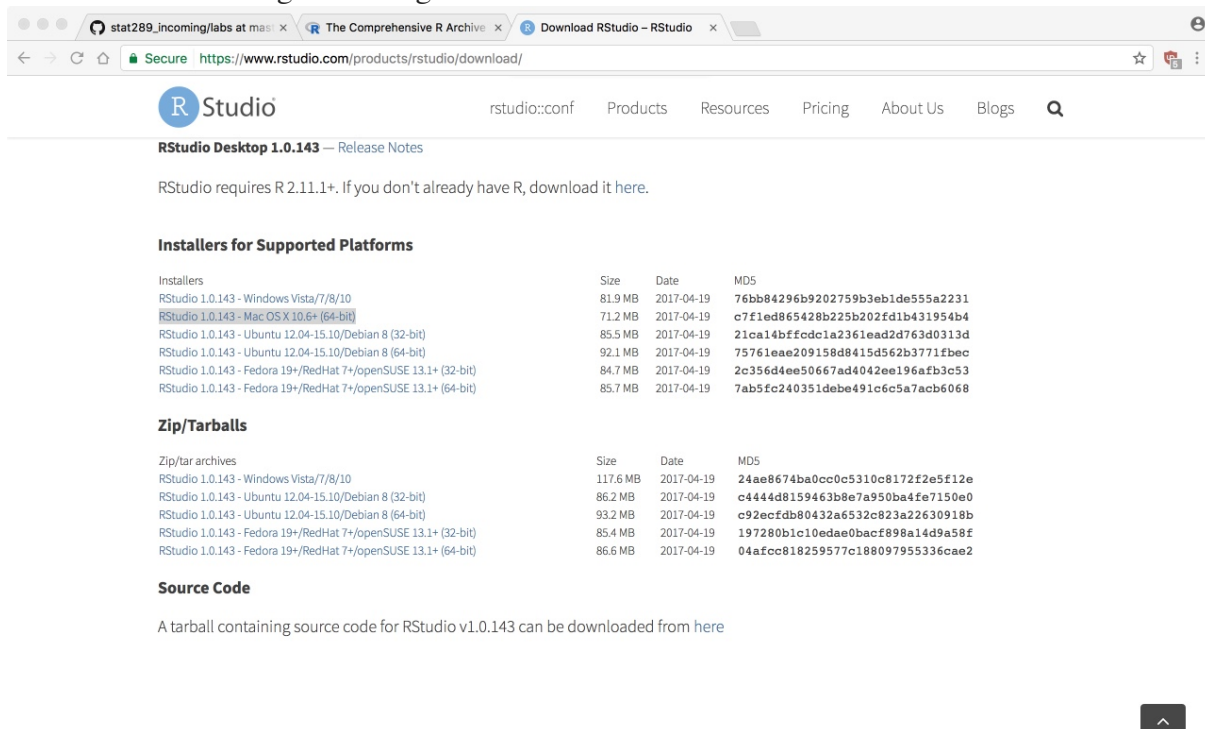
### Zip/Tarballs

Zip/tar archives	Size	Date	MD5
<a href="#">RStudio 1.0.143 - Windows Vista/7/8/10</a>	117.6 MB	2017-04-19	24ae8674ba0cc0c5310c8172f2e5f12e
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (32-bit)</a>	86.2 MB	2017-04-19	c444d8159463b8e7a950ba4fe7150e0
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (64-bit)</a>	93.2 MB	2017-04-19	c92ecfdb80432a6532c823a22630918b
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (32-bit)</a>	85.4 MB	2017-04-19	197280b1c10edae0bacf898a14d9a58f
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (64-bit)</a>	86.6 MB	2017-04-19	04afcc818259577c188097955336cae2

### Source Code

A tarball containing source code for RStudio v1.0.143 can be downloaded from [here](#)

And the macOS link gives a dmg:



**RStudio Desktop 1.0.143** — Release Notes

RStudio requires R 2.11.1+. If you don't already have R, download it [here](#).

### Installers for Supported Platforms

Installers	Size	Date	MD5
<a href="#">RStudio 1.0.143 - Windows Vista/7/8/10</a>	81.9 MB	2017-04-19	76bb84296b9202759b3eb1de555a2231
<a href="#">RStudio 1.0.143 - Mac OS X 10.6+ (64-bit)</a>	71.2 MB	2017-04-19	c7f1ed865428b225b202fd1b431954b4
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (32-bit)</a>	85.5 MB	2017-04-19	21ca14bffc1a2361ead2d763d0313d
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (64-bit)</a>	92.1 MB	2017-04-19	75761eae209158d8415d562b3771fbec
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (32-bit)</a>	84.7 MB	2017-04-19	2c356d4ee50667ad4042ee196afb3c53
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (64-bit)</a>	85.7 MB	2017-04-19	7ab5fc240351debe491c6c5a7acb6068

### Zip/Tarballs

Zip/tar archives	Size	Date	MD5
<a href="#">RStudio 1.0.143 - Windows Vista/7/8/10</a>	117.6 MB	2017-04-19	24ae8674ba0cc0c5310c8172f2e5f12e
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (32-bit)</a>	86.2 MB	2017-04-19	c444d8159463b8e7a950ba4fe7150e0
<a href="#">RStudio 1.0.143 - Ubuntu 12.04-15.10/Debian 8 (64-bit)</a>	93.2 MB	2017-04-19	c92ecfdb80432a6532c823a22630918b
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (32-bit)</a>	85.4 MB	2017-04-19	197280b1c10edae0bacf898a14d9a58f
<a href="#">RStudio 1.0.143 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (64-bit)</a>	86.6 MB	2017-04-19	04afcc818259577c188097955336cae2

### Source Code

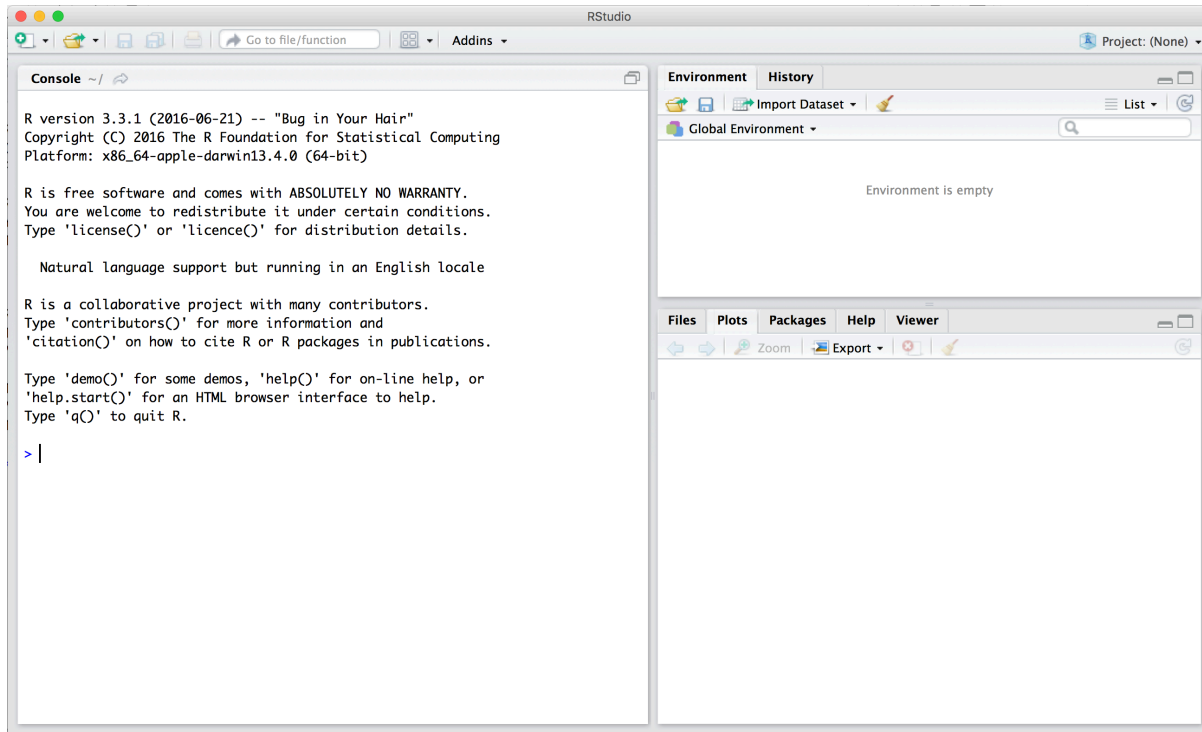
A tarball containing source code for RStudio v1.0.143 can be downloaded from [here](#)

Now, install RStudio as you would any other program. It should link automatically to the version of R you just installed.

## Installing R packages

The final step is to download all of the R packages that we will need for the semester. It is generally easier to do these all at once rather than as we go along.

Go ahead and launch RStudio. You should see a window that looks like this:



To install the packages required for class, run the following lines of code in the console (copy and paste them, then click “enter”). There may be a warning about one or two packages not being available. Note that this may take 5-10 minutes to finish; on slower connections or older computers, it may take even longer. If you run into any problems, please let me know!

```
pkgs <- c("ggplot2","Rmisc","gdata","lubridate","tidyverse","tidyr")

install.packages(pkgs,
  repos = "https://cloud.r-project.org",
  type = "binary",
  dependencies = TRUE,
  quiet = TRUE)
```