How to Install R, RStudio and R Packages – The Easiest Process Ever!

data-flair.training/blogs/how-to-install-r

DataFlair Team

October 17, 2017

With this tutorial, we will learn to install RStudio and R for Mac, Linux and Windows along with its process of updating in all these operating systems. We will also cover the concept of R packages in detail.

Let's start the R installation tutorial.

Steps to Install R, RStudio, and R Packages

Here we will discuss the simple steps to install R. But, before installing R, we will have to install RStudio. So, first, let's learn the process of RStudio installation.

We have to follow three basic steps in the same order to run R and RStudio on your system.

1. Install R
2. Then, install RStudio
3. Lastly, install R Packages

1. Install R

The process of installing R depends on the type of your operating system. R can be installed in the following ways:

For Mac

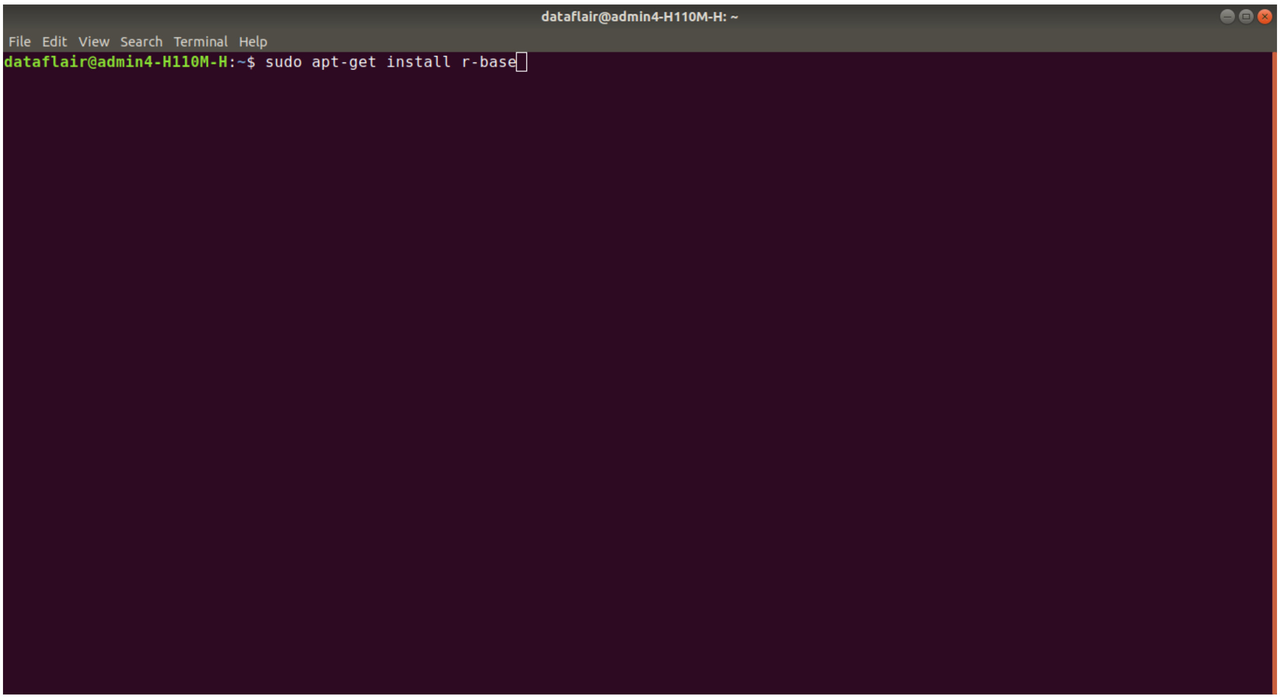
Download the latest version of the .pkg file from the following link:

https://cran.r-project.org/bin/macosx/

Open the downloaded .pkg file and install R.

Now, for Linux

For Ubuntu with Apt-get installed, execute sudo apt-get install r-base in terminal.

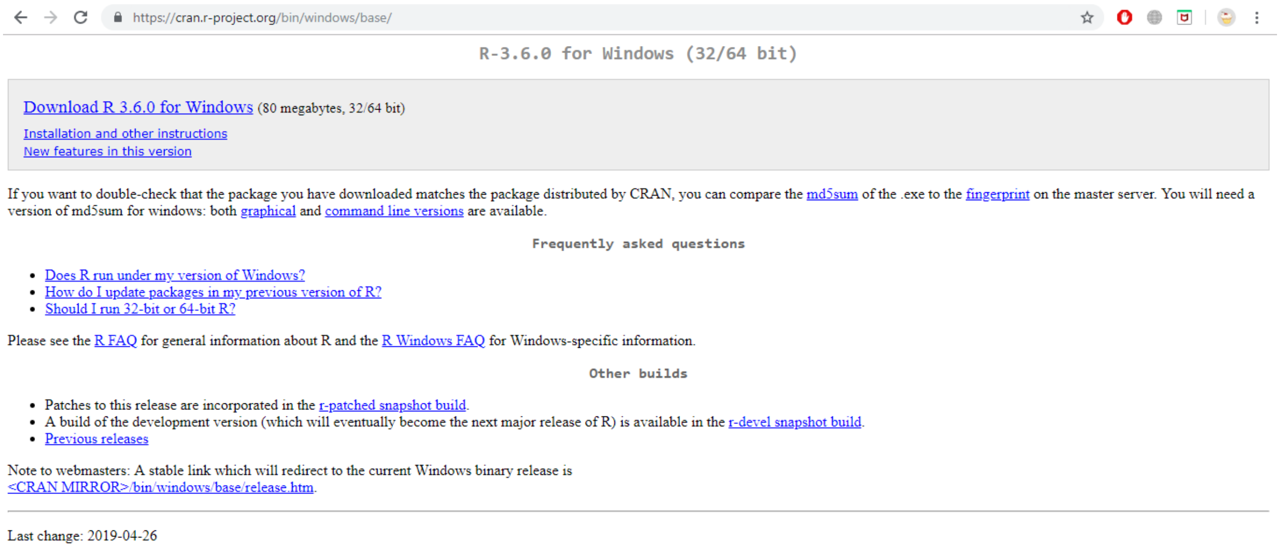

dataflair@admin4-H110M-H: ~
File Edit View Search Terminal Help

```
dataflair@admin4-H110M-H:~$ sudo apt-get install r-base
```

Lastly, for Windows

Step 1: Go to the website – *https://cran.r-project.org/bin/windows/base/*

Step 2: Click on the “Download R 3.6.0 for Windows”



R-3.6.0 for Windows (32/64 bit)

Download R 3.6.0 for Windows (80 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

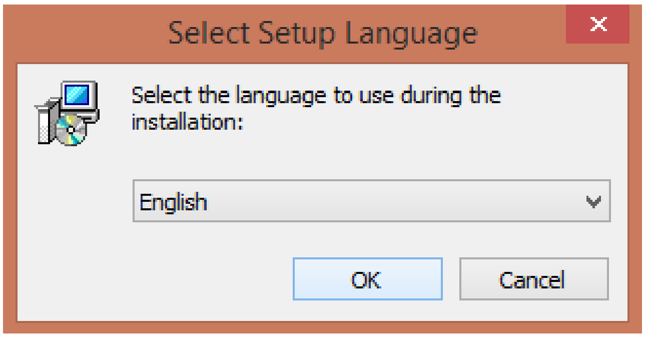
Note to webmasters: A stable link which will redirect to the current Windows binary release is
<CRAN MIRROR>/bin/windows/base/release.htm.

Last change: 2019-04-26

Step 3: Clicking on the tab will download the R installer. Double click on the installer to launch it.

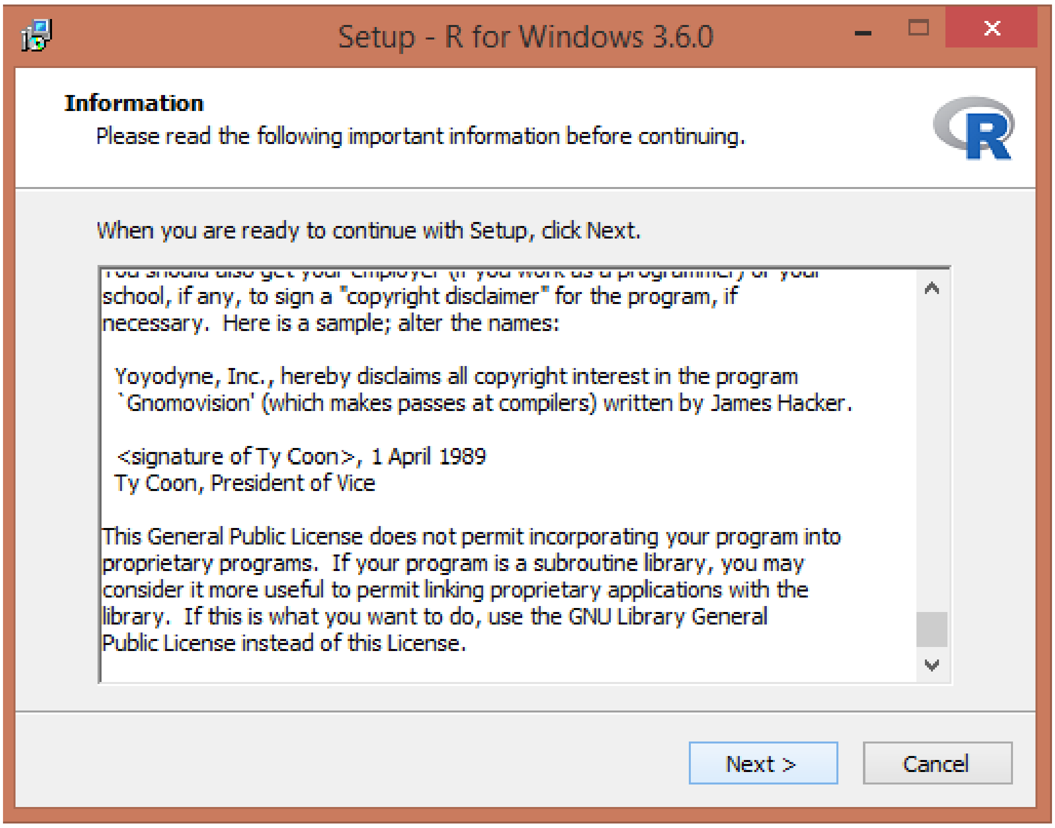
Step 4: Select the language of your choice in the installer and click **OK**.

Step 5: Clicking on Next will lead you to the important information of the license. Click on **Next**.



Select the language to use during the installation:

English



Information

Please read the following important information before continuing.

When you are ready to continue with Setup, click Next.

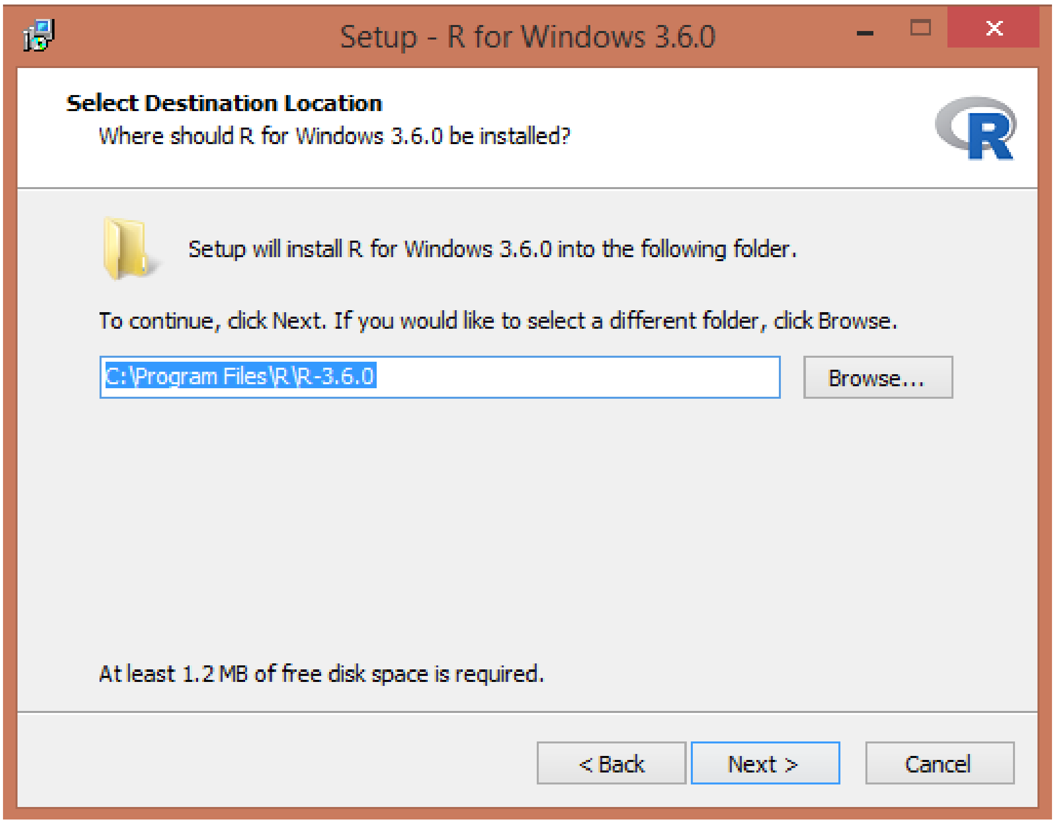
school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program `Gnomovision' (which makes passes at compilers) written by James Hacker.

<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Library General Public License instead of this License.

Step 6: Then, it will provide you with an interface for selecting the destination for your R installation.



Select Destination Location

Where should R for Windows 3.6.0 be installed?

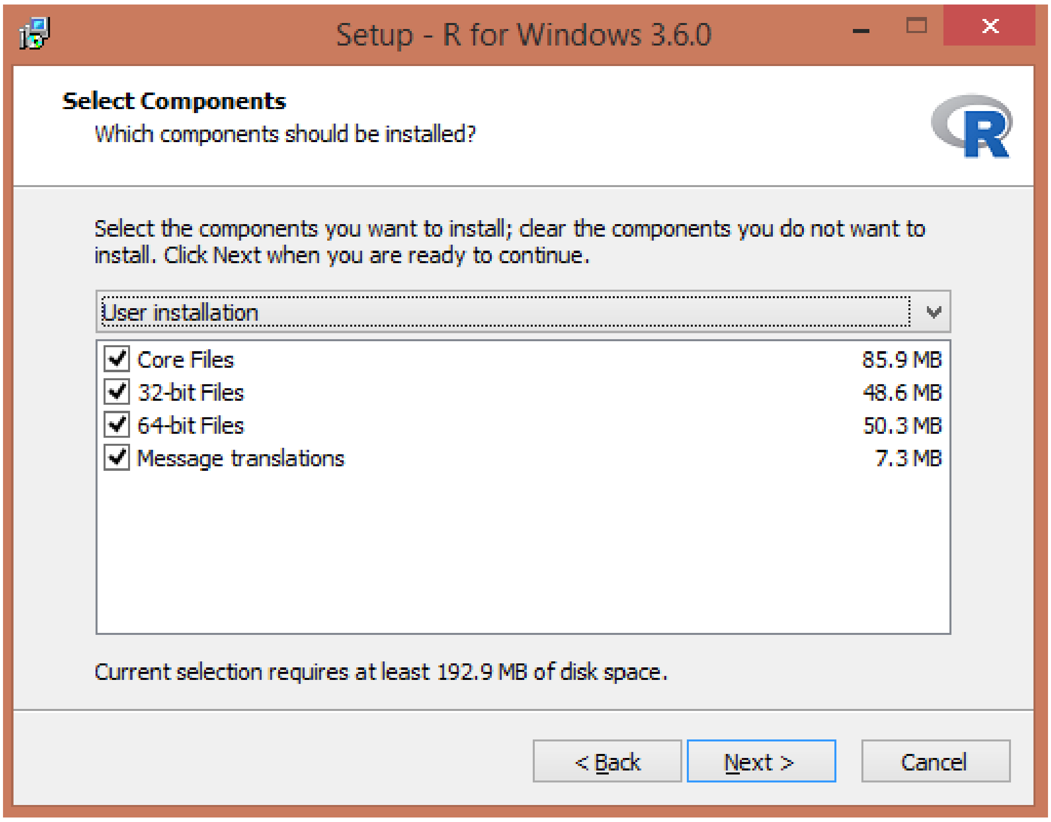
Setup will install R for Windows 3.6.0 into the following folder.

To continue, click Next. If you would like to select a different folder, click Browse.

C:\Program Files\R\R-3.6.0

At least 1.2 MB of free disk space is required.

Step 7: After clicking on Next, you will be directed to select components for installation. It is ideal to keep all the components.



Select Components

Which components should be installed?

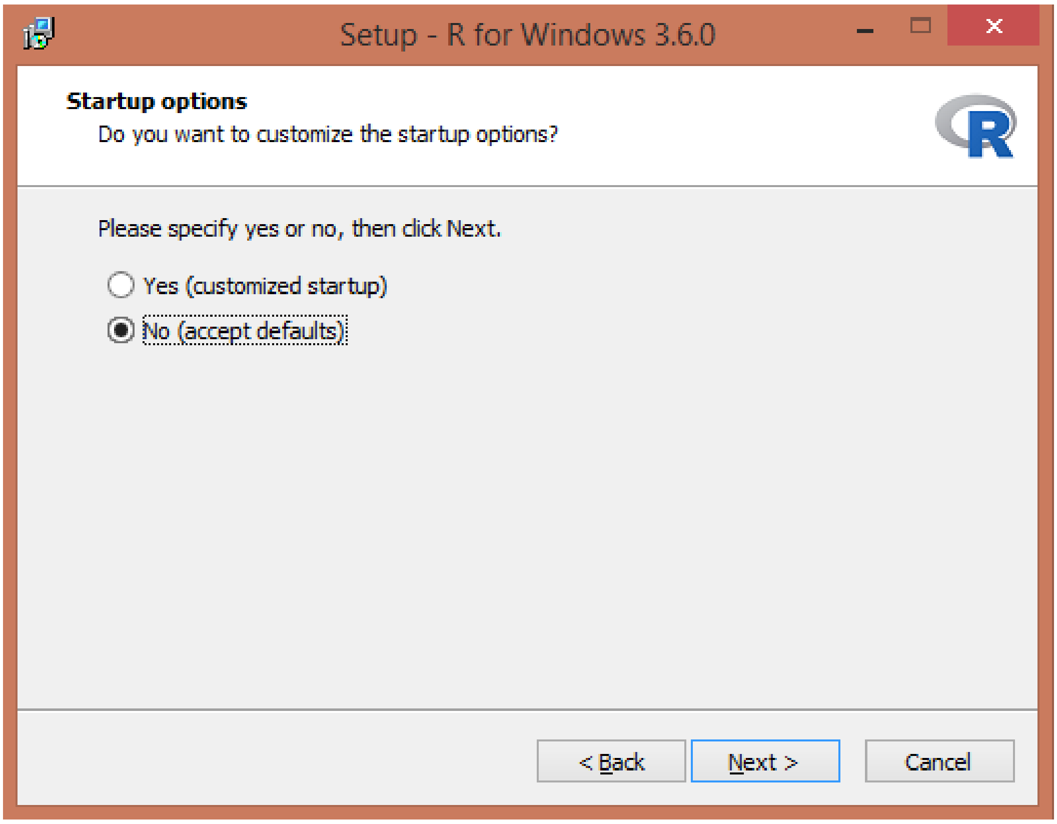
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

User installation

☑ Core Files	85.9 MB
☑ 32-bit Files	48.6 MB
☑ 64-bit Files	50.3 MB
☑ Message translations	7.3 MB

Current selection requires at least 192.9 MB of disk space.

Step 8: In the next step, you will be asked if you would want to customize the startup. Click on **No(accept defaults)** as an ideal option.



Setup - R for Windows 3.6.0

Startup options

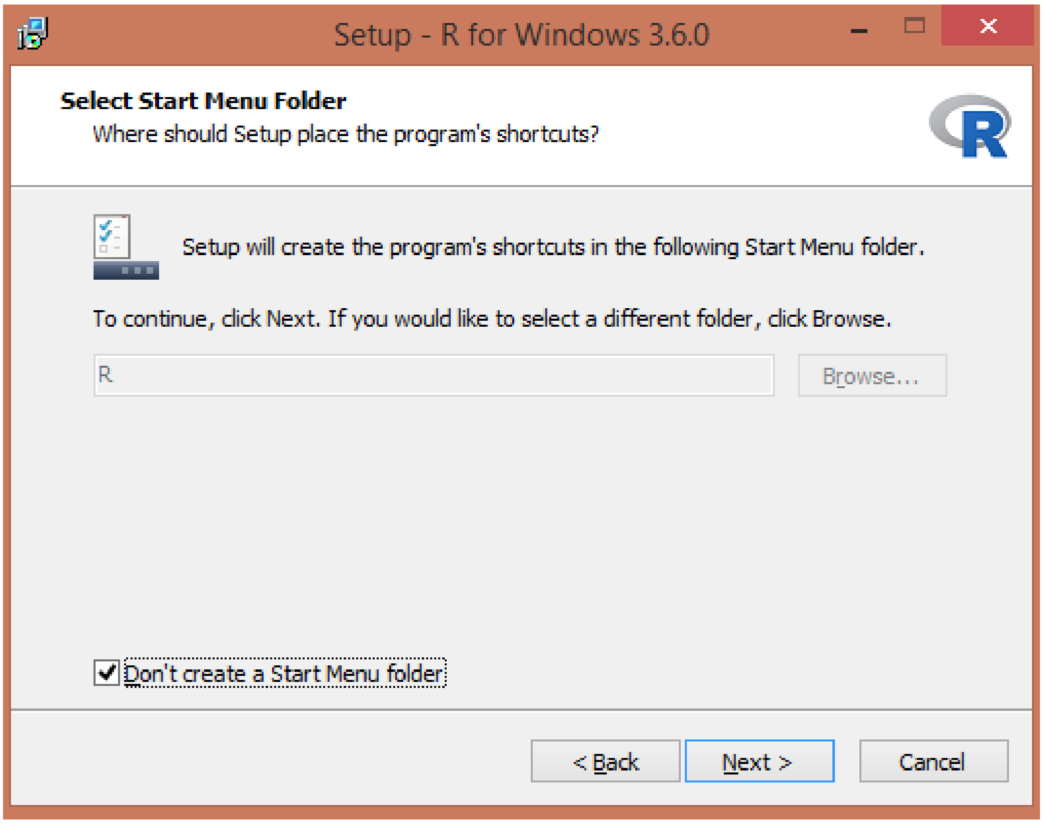
Do you want to customize the startup options?

Please specify yes or no, then click Next.

○ Yes (customized startup)

● No (accept defaults)

Step 9: In the next step, you will be asked to select the start menu folder. By default, start menu folder cannot be created but you can change that by unchecking the checkbox.



Setup - R for Windows 3.6.0

Select Start Menu Folder

Where should Setup place the program's shortcuts?

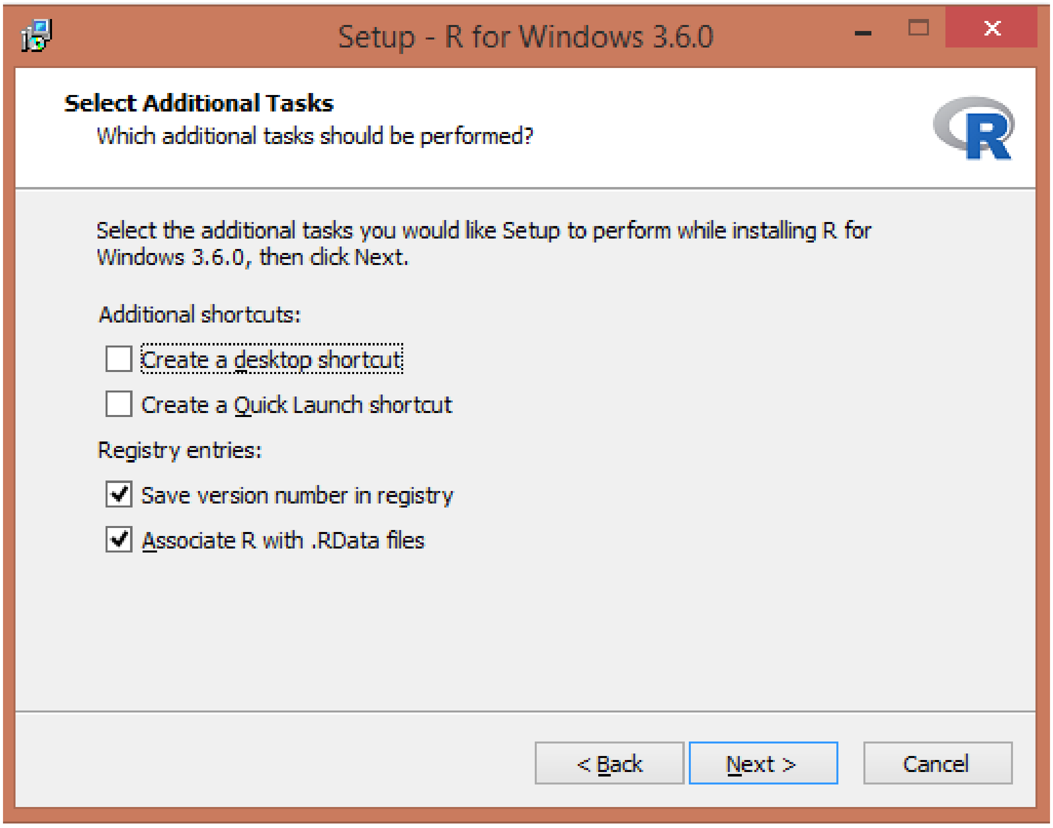
Setup will create the program's shortcuts in the following Start Menu folder.

To continue, click Next. If you would like to select a different folder, click Browse.

R

☑ Don't create a Start Menu folder

Step 10: In the next step, you will be asked for additional details. You can create a desktop shortcut or a Quick Launch Startup by checking the boxes.



Setup - R for Windows 3.6.0

Select Additional Tasks

Which additional tasks should be performed?

Select the additional tasks you would like Setup to perform while installing R for Windows 3.6.0, then click Next.

Additional shortcuts:

☐ Create a desktop shortcut

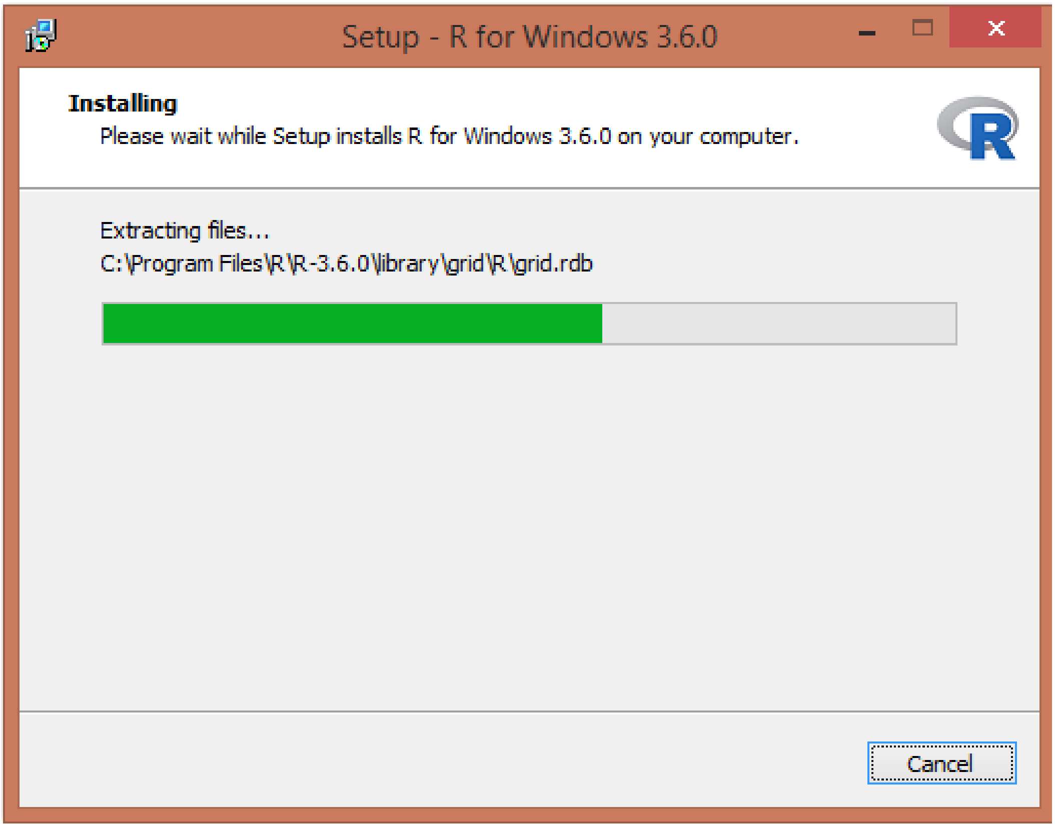
☐ Create a Quick Launch shortcut

Registry entries:

☑ Save version number in registry

☑ Associate R with .RData files

Step 11: Clicking on Next will prompt the installation to start. After this, the installation is complete and R is installed.



Setup - R for Windows 3.6.0

Installing

Please wait while Setup installs R for Windows 3.6.0 on your computer.

Extracting files...

C:\Program Files\R\R-3.6.0\library\grid\R\grid.rdb

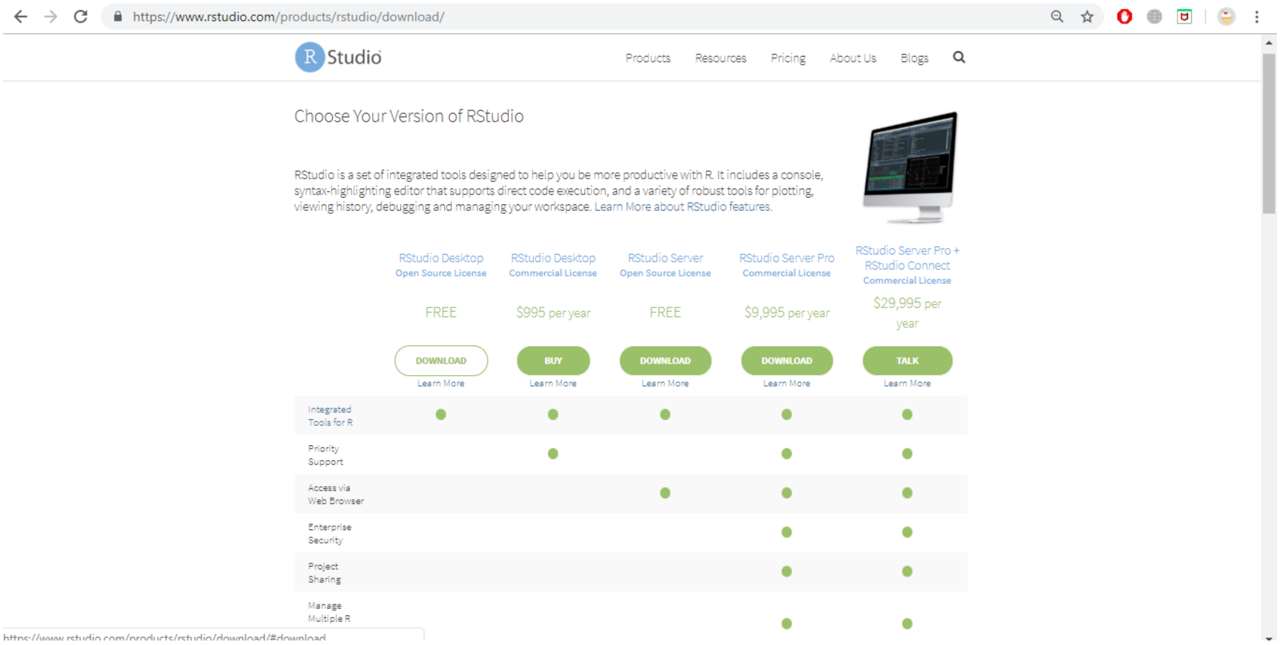
You must definitely check the Latest Features of R Programming

2. Install RStudio

Now, in order to install the IDE RStudio, we will take the following steps:

Step 1: Go to the website – *https://www.rstudio.com/products/rstudio/download/*

Step 2: Here, you will find various versions of R. Click on the **Download** button.

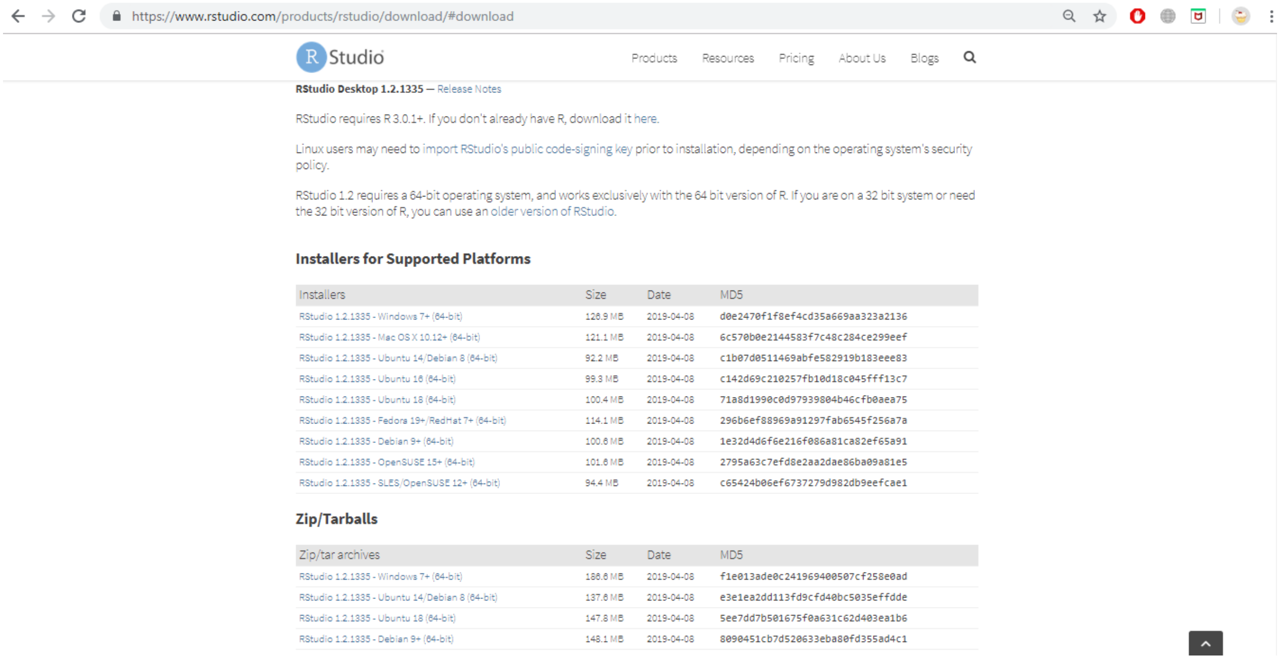

https://www.rstudio.com/products/rstudio/download/
RStudio
Products
Resources
Pricing
About Us
Blogs
https://www.rstudio.com/products/rstudio/download/#download

Choose Your Version of RStudio

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 Desktop Open Source License	RStudio Desktop Commercial License	RStudio Server Open Source License	RStudio Server Pro Commercial License	RStudio Server Pro + RStudio Connect Commercial License
	FREE	$995 per year	FREE	$9,995 per year	$29,995 per year
	DOWNLOAD Learn More	BUY Learn More	DOWNLOAD Learn More	DOWNLOAD Learn More	TALK Learn More
Integrated Tools for R	●	●	●	●	●
Priority Support		●		●	●
Access via Web Browser			●	●	●
Enterprise Security				●	●
Project Sharing				●	●
Manage Multiple R				●	●

Step 3: Clicking on Download will shift the page lower to the various platforms of R installation. Click on **Windows 7+ (64 Bit)**



RStudio Desktop 1.2.1335 — Release Notes

RStudio requires R 3.0.1+. If you don't already have R, download it here.

Linux users may need to import RStudio's public code-signing key prior to installation, depending on the operating system's security policy.

RStudio 1.2 requires a 64-bit operating system, and works exclusively with the 64 bit version of R. If you are on a 32 bit system or need the 32 bit version of R, you can use an older version of RStudio.

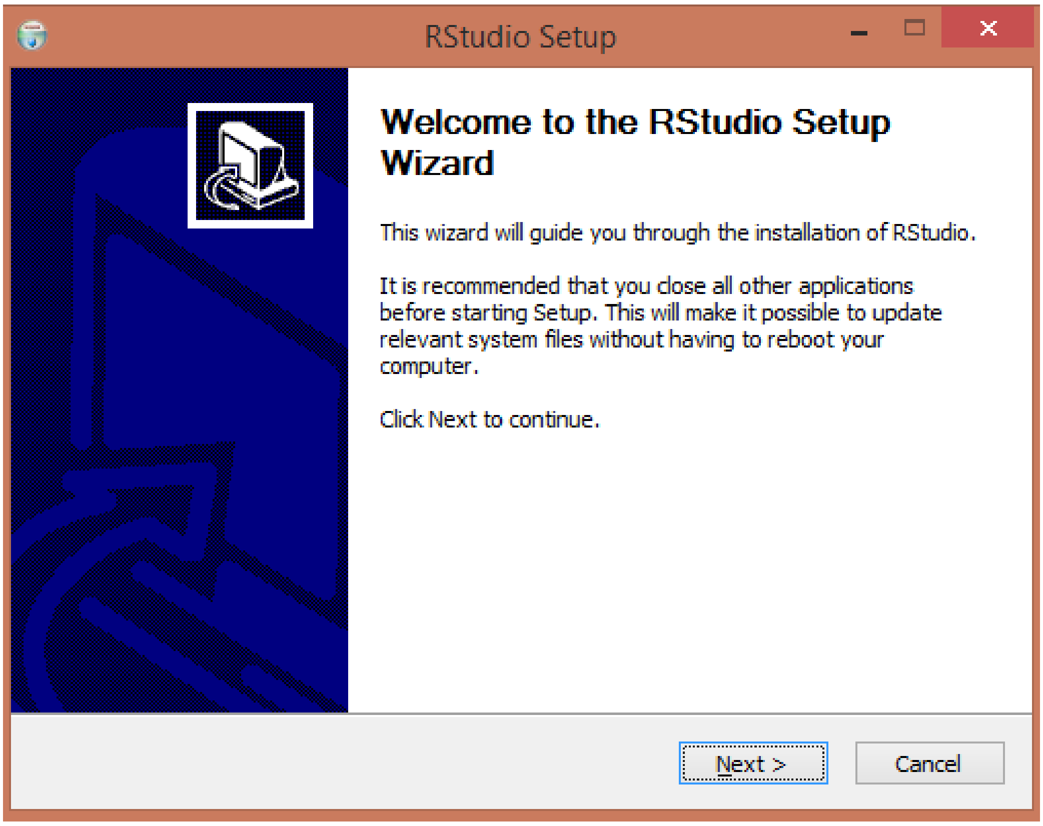
Installers for Supported Platforms

Installers	Size	Date	MD5
RStudio 1.2.1335 - Windows 7+ (64-bit)	126.9 MB	2019-04-08	d0e2470f1f8ef4cd35a669aa323a2136
RStudio 1.2.1335 - Mac OS X 10.12+ (64-bit)	121.1 MB	2019-04-08	6c570b0e2144583f7c48c284ce299eef
RStudio 1.2.1335 - Ubuntu 14/Debian 8 (64-bit)	92.2 MB	2019-04-08	c1b07d0511469abfe582919b183eee83
RStudio 1.2.1335 - Ubuntu 16 (64-bit)	99.3 MB	2019-04-08	c142d69c210257fb10d18c045fff13c7
RStudio 1.2.1335 - Ubuntu 18 (64-bit)	100.4 MB	2019-04-08	71a8d1990c0d97939804b46cfb0aea75
RStudio 1.2.1335 - Fedora 19+/RedHat 7+ (64-bit)	114.1 MB	2019-04-08	296b6ef88969a91297fab6545f256a7a
RStudio 1.2.1335 - Debian 9+ (64-bit)	100.6 MB	2019-04-08	1e32d4d6f6e216f086a81ca82ef65a91
RStudio 1.2.1335 - OpenSUSE 15+ (64-bit)	101.6 MB	2019-04-08	2795a63c7efd8e2aa2dae86ba09a81e5
RStudio 1.2.1335 - SLES/OpenSUSE 12+ (64-bit)	94.4 MB	2019-04-08	c65424b06ef6737279d982db9eefcae1

Zip/Tarballs

Zip/tar archives	Size	Date	MD5
RStudio 1.2.1335 - Windows 7+ (64-bit)	186.6 MB	2019-04-08	f1e013ade0c241969400507cf258e0ad
RStudio 1.2.1335 - Ubuntu 14/Debian 8 (64-bit)	137.6 MB	2019-04-08	e3e1ea2dd113fd9cfd40bc5035effdde
RStudio 1.2.1335 - Ubuntu 18 (64-bit)	147.8 MB	2019-04-08	5ee7dd7b501675f0a631c62d403ea1b6
RStudio 1.2.1335 - Debian 9+ (64-bit)	148.1 MB	2019-04-08	8090451cb7d520633eba80fd355ad4c1

Step 4: After the download is finished, click on the installer and click **Next**.



RStudio Setup

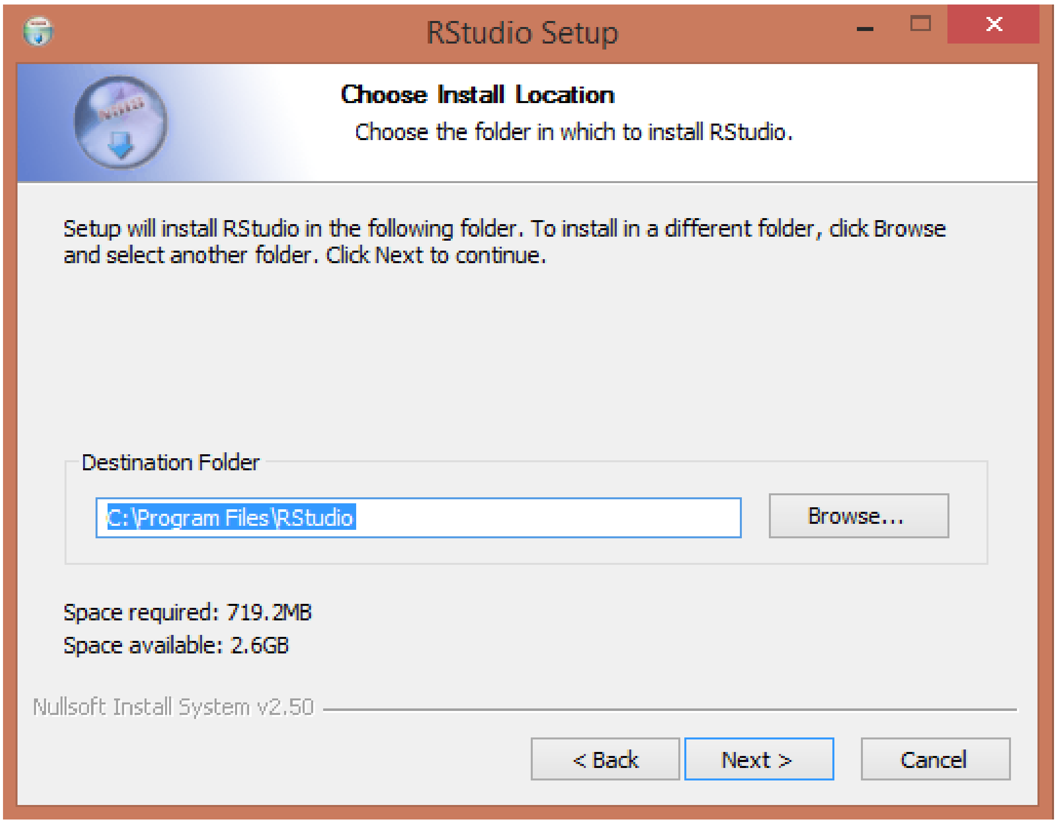
Welcome to the RStudio Setup Wizard

This wizard will guide you through the installation of RStudio.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

Step 5: Clicking on Next will direct you to the installation location.



RStudio Setup

Choose Install Location

Choose the folder in which to install RStudio.

Setup will install RStudio in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

Destination Folder

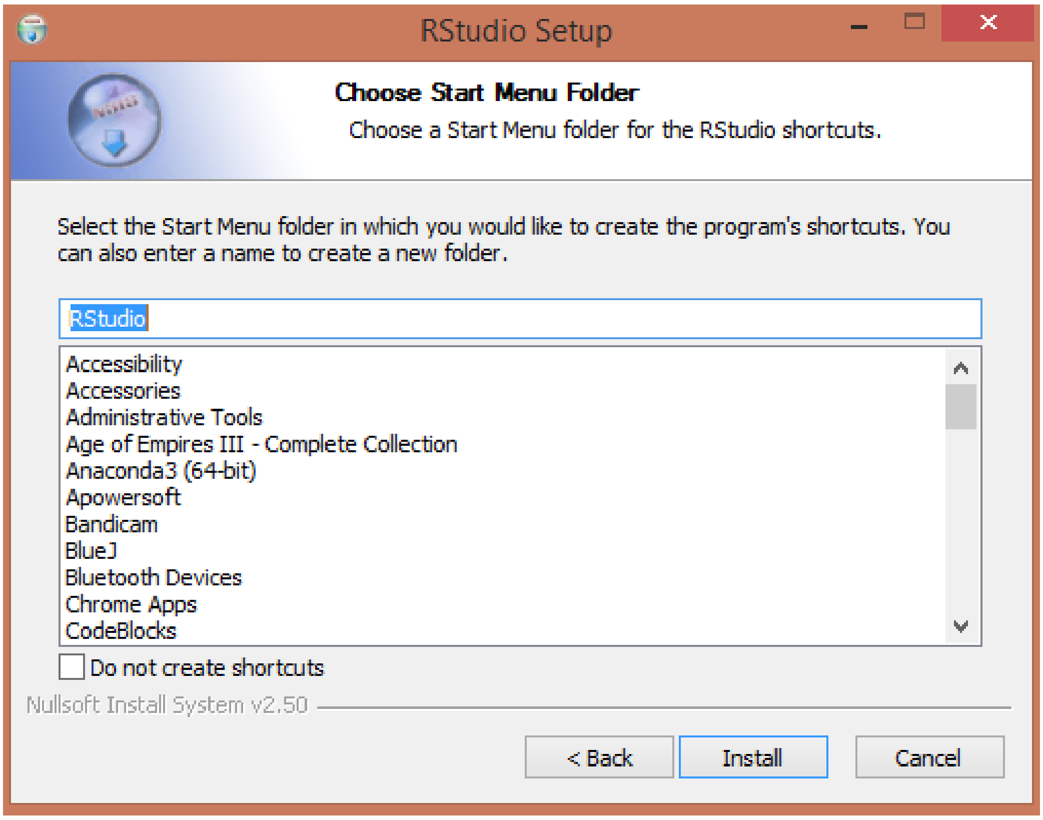
C:\Program Files\RStudio

Space required: 719.2MB

Space available: 2.6GB

Nullsoft Install System v2.50

Step 6: Clicking on Next will direct you to choose the Start Menu Folder.



RStudio Setup

Choose Start Menu Folder

Choose a Start Menu folder for the RStudio shortcuts.

Select the Start Menu folder in which you would like to create the program's shortcuts. You can also enter a name to create a new folder.

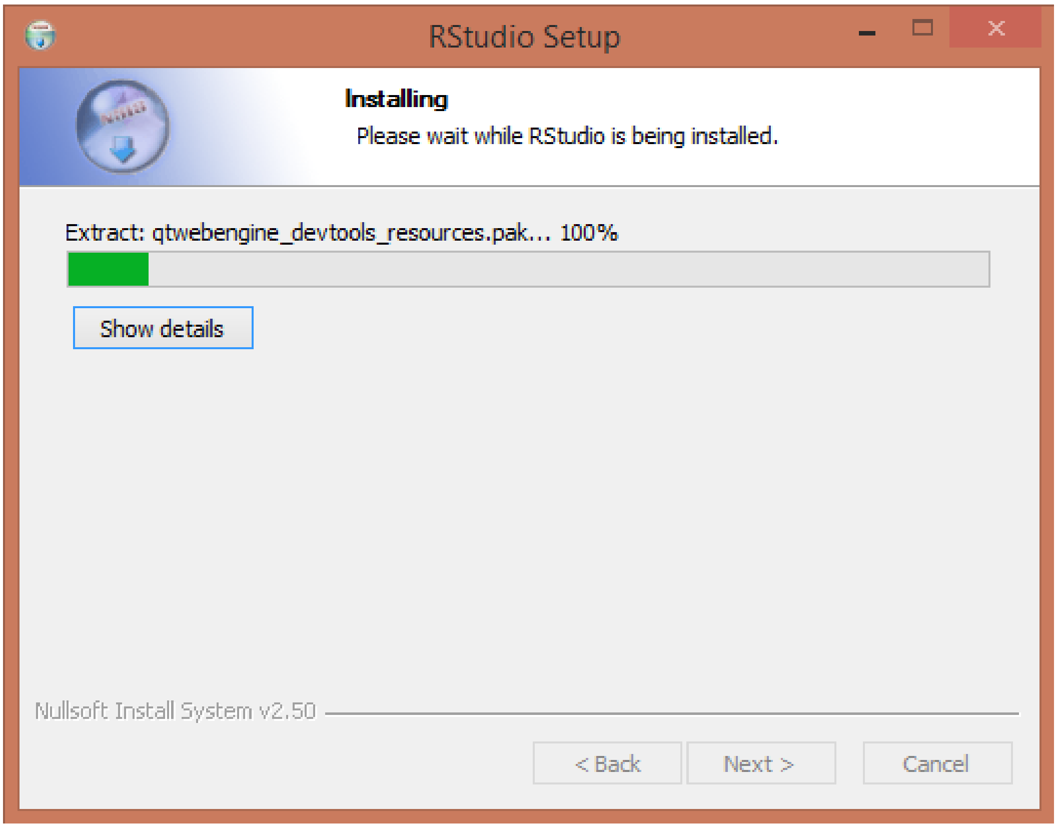
RStudio

Accessibility
Accessories
Administrative Tools
Age of Empires III - Complete Collection
Anaconda3 (64-bit)
Apowersoft
Bandicam
BlueJ
Bluetooth Devices
Chrome Apps
CodeBlocks

□ Do not create shortcuts

Nullsoft Install System v2.50

Step 7: Clicking on Install will start the installation process.



RStudio Setup

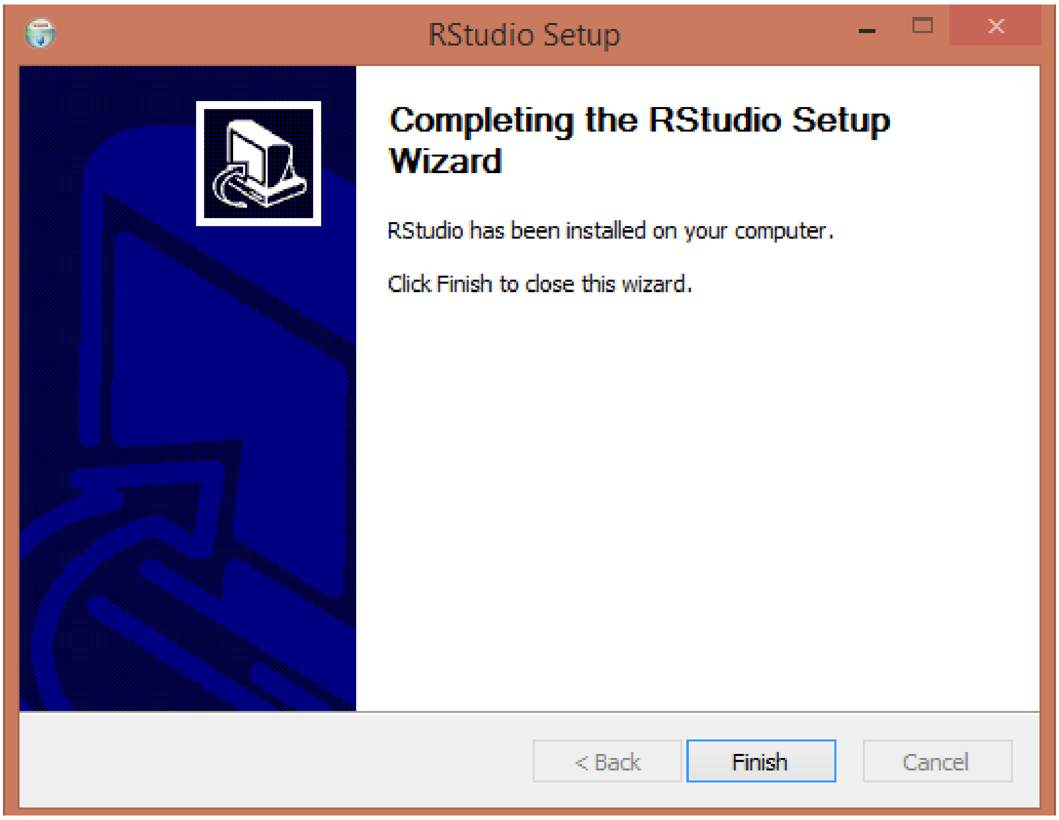
Installing

Please wait while RStudio is being installed.

Extract: qtwebengine_devtools_resources.pak... 100%

Nullsoft Install System v2.50

Step 8: Finally, click on the **Finish** button.



Completing the RStudio Setup Wizard

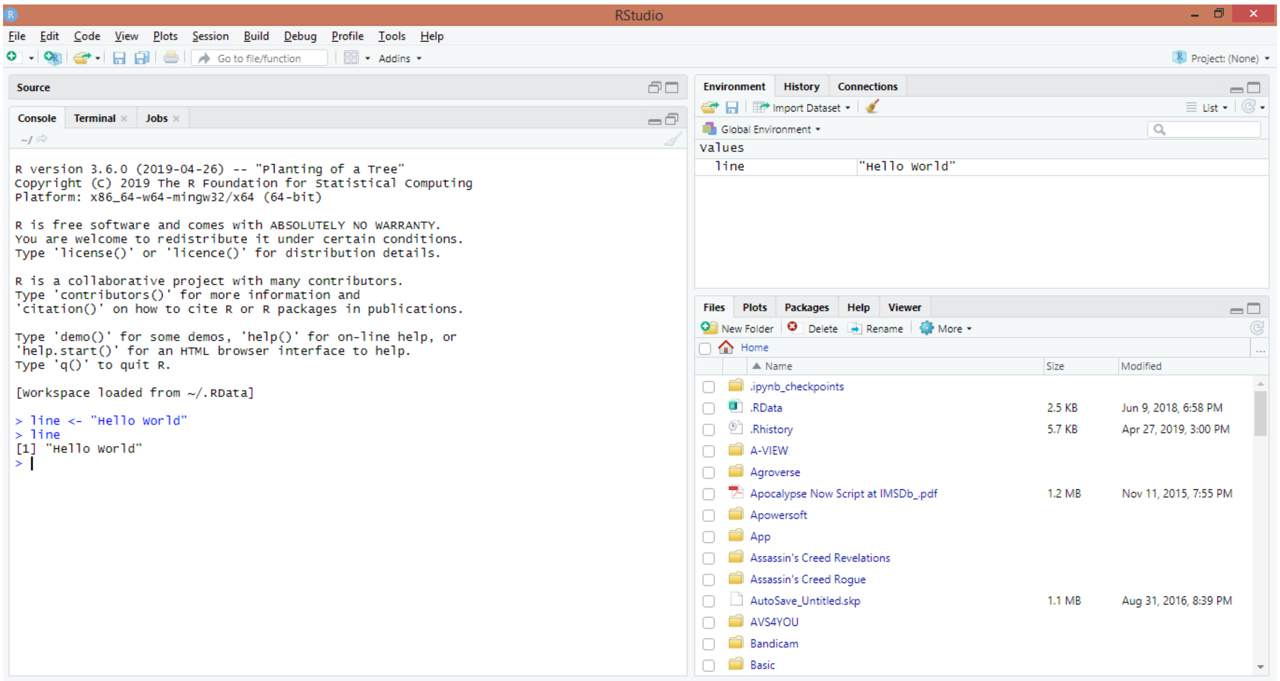
RStudio has been installed on your computer.

Click Finish to close this wizard.

Step 9: In the final step, test if R is properly installed by opening RStudio and typing following lines:

1. > line <- "Hello World"
2. > line

Output:


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Source
Console Terminal Jobs
~/
Environment History Connections
Import Dataset
List
Global Environment
Files Plots Packages Help Viewer
New Folder Delete Rename More
Home

```
R version 3.6.0 (2019-04-26) -- "Planting of a Tree"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (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.

[Workspace loaded from ~/.RData]

> line <- "Hello World"
> line
[1] "Hello World"
> |
```

Values

line	"Hello World"

Name	Size	Modified
.ipynb_checkpoints		
.RData	2.5 KB	Jun 9, 2018, 6:58 PM
.Rhistory	5.7 KB	Apr 27, 2019, 3:00 PM
A-VIEW		
Agroverse		
Apocalypse Now Script at IMSDb_.pdf	1.2 MB	Nov 11, 2015, 7:55 PM
Apowersoft		
App		
Assassin's Creed Revelations		
Assassin's Creed Rogue		
AutoSave_Untitled.skp	1.1 MB	Aug 31, 2016, 8:39 PM
AVS4YOU		
Bandicam		
Basic		

You have successfully installed R!

3. Install the R Packages (Optional)

In RStudio, if you require a particular library, then you can go through the following instructions:

- First, run RStudio.
- After clicking on the packages tab, click on install. The following dialog box will appear.
- In the Install Packages dialog, write the package name you want to install under the Packages field and then click install. This will install the package you searched for or give you a list of matching package based on your package text.

Updating R and RStudio

1. Updating R

Mac and Ubuntu

On Mac and Ubuntu, you need to go to the CRAN website, *https://www.r-project.org/* to install the newer package installer.

Windows

A package called installr, which is only for Windows can be used to ease the process. Updating on windows is tricky.

If you don't have installr package then first install it:

1. #installing the latest installr package:
2. install.packages("installr"); library(installr) # For installing & loading installr
3. updateR()

After running the updateR(), R will detect if there is a new version available. If there is, it will download and install it.

2. Updating RStudio

Updating RStudio is easy, go to Help > Check for Updates to install a newer version.

Don't forget to explore the RStudio Tutorial for Beginners

3. Updating R Packages

3.1 Updating Out of date Packages

Install.packages() is used to install any package of CRAN. For example:

Typing *Install.packages("ggplot2")* in the console will install the latest package of *ggplot2*.

You can also update any out of data package with the help of *update.packages()* function.

```
update.packages()
```

Doing so will prompt the system to ask your permission prior to installation of the package. In order to not let the system prompt for your permission, use the *ask = False* attribute in the *packages()* function.

```
update.packages(ask = FALSE)
```

Unfortunately, this won't update packages installed by *devtools::install_github().*

3.2 Updating all Packages after R update

By using package installr, we can handle it on windows. But for other operating systems, after updating R, a lot of packages might have been built under the old R version. It would be safer to re-install all the packages already installed. This can be done with the following commands. Again this won't update packages installed with *devtools::install_github().*

```
## get packages installed
packs = as.data.frame(installed.packages(.libPaths()[1]), stringsAsFactors = F)
## and now re-install install packages using install.packages()
install.packages(packs$Package)
```

Master the complete process of <u>Installing and Using Packages in R Programming</u>

R Packages (Libraries)

Packages comprise of R functions, data and compiled code that are present in a well-defined format. The location where the packages are installed is known as a library. R comes with a standard set of packages. Others are available for download and installation. If we will install it once, we have to be load it into the session to be used.

1. Recommended Packages

In packages, we use many R functions, free libraries of code written by R's active user community.

Open an R session and type this in the command line to install an R package.

```
install.packages("<the package's name>")
```

R package will be downloaded from CRAN.

There are thousands of useful R packages for us, but navigating them all can be a challenge.

2. Basic Notions

The R Language

Statistical computations are carried from R computer language.

R was created by Robert Gentleman and Ross Ihaka at the University of Auckland.

It has now evolved into a featured tool for carrying out statistical operations.

The R Project

It is an international collaboration of researchers who work on statistical computing.

20 members are responsible for the maintenance and enhancement of R.

Releases of the R environment are made through the CRAN (Comprehensive R Archive Network) twice per year.

The software has a ‘free software’ license which makes it possible for anyone to download and use it.

There are over 3500 extension packages that have been contributed to CRAN.

Basic R Concepts

The interpreter is a special program that processes the programs written in R language. It converts the R code to machine code.

An interpreter is also responsible for translating a program, line by line into its corresponding machine code.

On UNIX or LINUX machines, we can start R by typing the command “ R ” to a command interpreter prompt in a terminal window.

Better yet, we can run R within an Emacs window by typing M-x R.

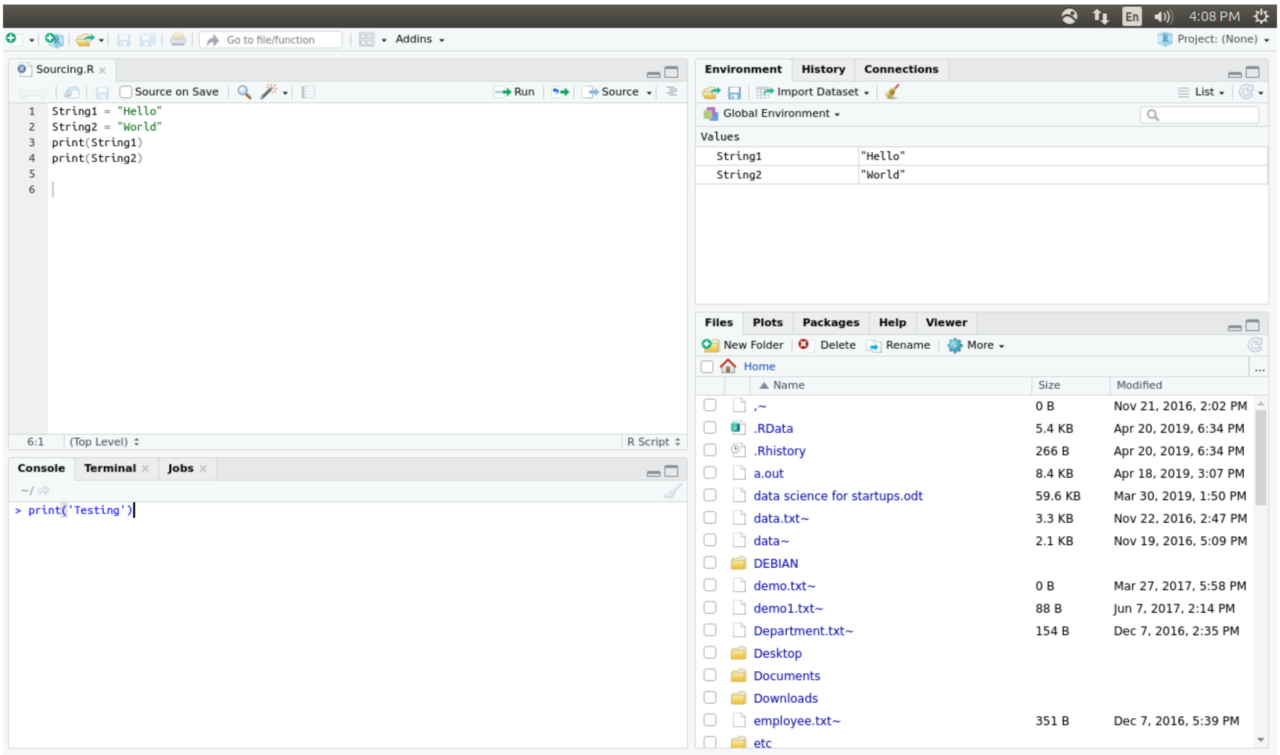
Basic Interaction with R Console

The most common form of interaction with R is through the command line in the console.

The user enters the command in the console.
The user types a command:

1. print('Testing')

Output:



Sourcing.R

```
String1 = "Hello"
String2 = "World"
print(String1)
print(String2)
```

Console

```
> print('Testing')
```

Environment — Global Environment — Values

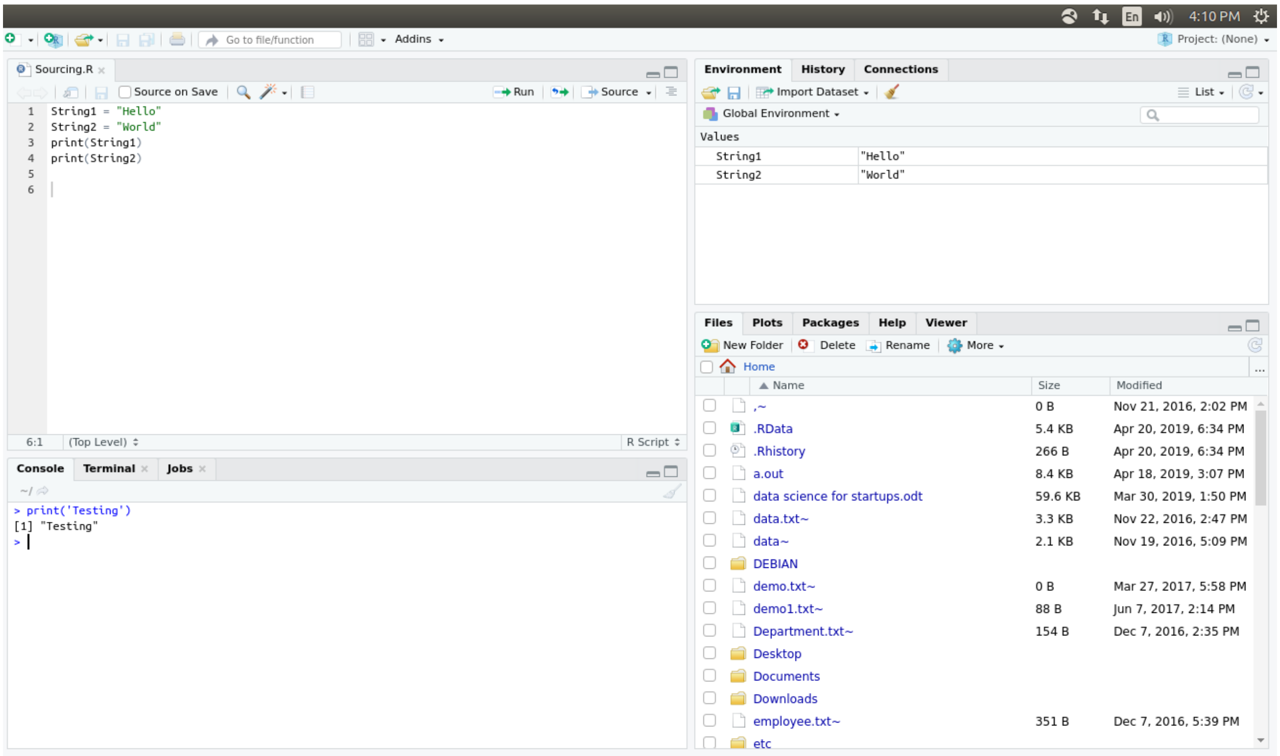
String1	"Hello"
String2	"World"

Files — Home

Name	Size	Modified
.~	0 B	Nov 21, 2016, 2:02 PM
.RData	5.4 KB	Apr 20, 2019, 6:34 PM
.Rhistory	266 B	Apr 20, 2019, 6:34 PM
a.out	8.4 KB	Apr 18, 2019, 3:07 PM
data science for startups.odt	59.6 KB	Mar 30, 2019, 1:50 PM
data.txt~	3.3 KB	Nov 22, 2016, 2:47 PM
data~	2.1 KB	Nov 19, 2016, 5:09 PM
DEBIAN		
demo.txt~	0 B	Mar 27, 2017, 5:58 PM
demo1.txt~	88 B	Jun 7, 2017, 2:14 PM
Department.txt~	154 B	Dec 7, 2016, 2:35 PM
Desktop		
Documents		
Downloads		
employee.txt~	351 B	Dec 7, 2016, 5:39 PM
etc		

After pressing the **Enter** key, the R interpreter executes and returns the answer to the user.

Output:



Sourcing.R

```
String1 = "Hello"
String2 = "World"
print(String1)
print(String2)
```

Console

```
> print('Testing')
[1] "Testing"
> 
```

Environment — Global Environment — Values

String1	"Hello"
String2	"World"

Files — Home

Name	Size	Modified
.~	0 B	Nov 21, 2016, 2:02 PM
.RData	5.4 KB	Apr 20, 2019, 6:34 PM
.Rhistory	266 B	Apr 20, 2019, 6:34 PM
a.out	8.4 KB	Apr 18, 2019, 3:07 PM
data science for startups.odt	59.6 KB	Mar 30, 2019, 1:50 PM
data.txt~	3.3 KB	Nov 22, 2016, 2:47 PM
data~	2.1 KB	Nov 19, 2016, 5:09 PM
DEBIAN		
demo.txt~	0 B	Mar 27, 2017, 5:58 PM
demo1.txt~	88 B	Jun 7, 2017, 2:14 PM
Department.txt~	154 B	Dec 7, 2016, 2:35 PM
Desktop		
Documents		
Downloads		
employee.txt~	351 B	Dec 7, 2016, 5:39 PM
etc		

It is also possible to store a sequence of commands in a file. Use .*R extension* and then ask R to execute all commands in the file that has .R extension.

Following is an example of a calculator made with R:

It is also possible to store a sequence of commands in a file. Use .R extension and then ask R to execute all commands in the file that has .R extension.

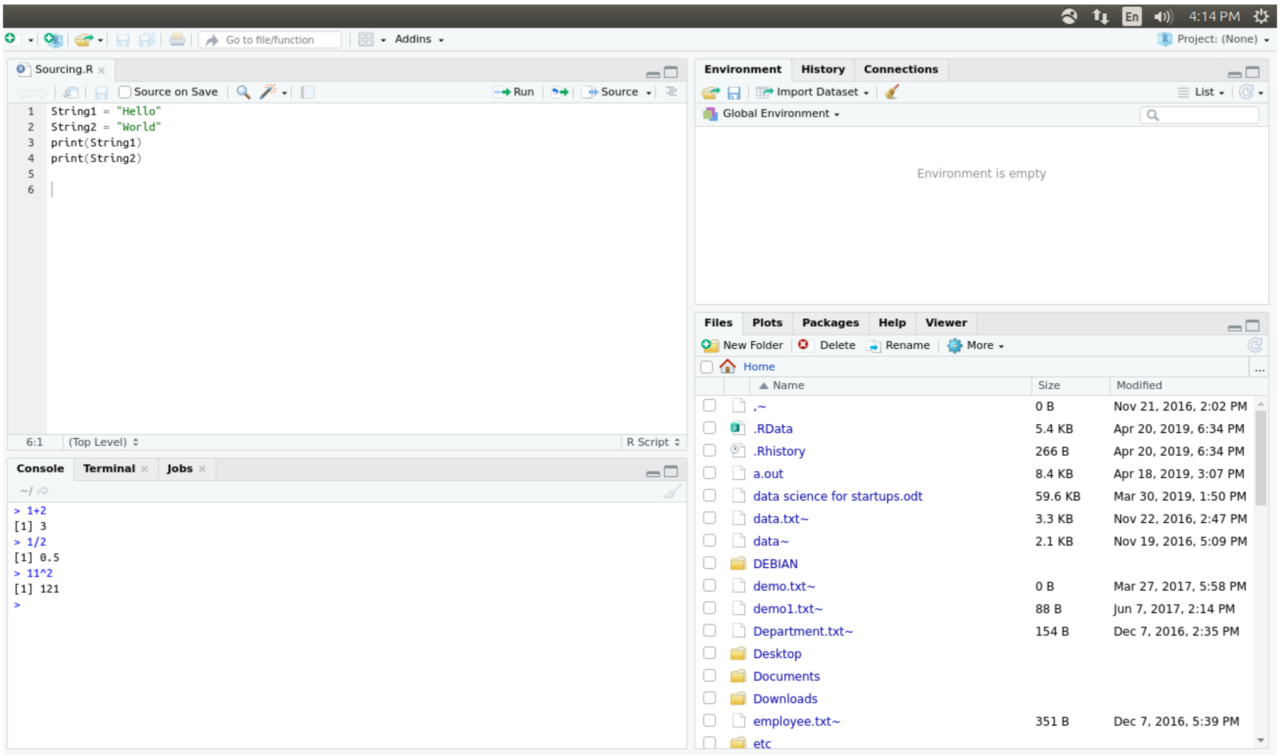
We may also use the console as a simple calculator.

Using R as a Calculator

- Users type expressions to the R interpreter.
- R responds by computing and printing the answers.

1. > 1+2
2. > 1/2
3. > 11^2

Output:



```
String1 = "Hello"
String2 = "World"
print(String1)
print(String2)

```

```
> 1+2
[1] 3
> 1/2
[1] 0.5
> 11^2
[1] 121
>
```

Environment is empty

Name	Size	Modified
,~	0 B	Nov 21, 2016, 2:02 PM
.RData	5.4 KB	Apr 20, 2019, 6:34 PM
.Rhistory	266 B	Apr 20, 2019, 6:34 PM
a.out	8.4 KB	Apr 18, 2019, 3:07 PM
data science for startups.odt	59.6 KB	Mar 30, 2019, 1:50 PM
data.txt~	3.3 KB	Nov 22, 2016, 2:47 PM
data~	2.1 KB	Nov 19, 2016, 5:09 PM
DEBIAN		
demo.txt~	0 B	Mar 27, 2017, 5:58 PM
demo1.txt~	88 B	Jun 7, 2017, 2:14 PM
Department.txt~	154 B	Dec 7, 2016, 2:35 PM
Desktop		
Documents		
Downloads		
employee.txt~	351 B	Dec 7, 2016, 5:39 PM
etc		

Documentation

Every good package consists of documentation. User will not know how to make sense of the package. Documentation is also useful for future-***you***, and for developers extending your package.

Object documentation is a type of reference documentation. It works like a dictionary.

If you are acquainted with the name of the object, documentation is really helpful.

Datasets

There are a large number of datasets that are open for free analysis in R. Furthermore, there are other open datasets that are available on Kaggle which you can directly utilize for analyzing and predicting.

Summary

We understood the process of installing RStudio and R in all the operating systems. We also learned the steps to update R, RStudio and R packages.