

Introduction to R and RStudio IDE

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Section 1

Why use R?

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

Source: <https://www.r-project.org/>

R is getting more popular among academician

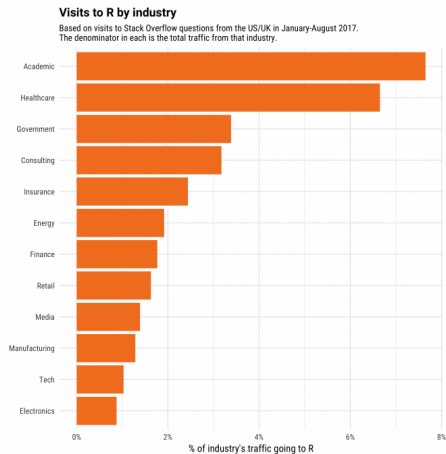


Figure 1: Impressive growth of R

{Source: <https://stackoverflow.blog/2017/10/10/impressive-growth-r/>}

Availability of R packages

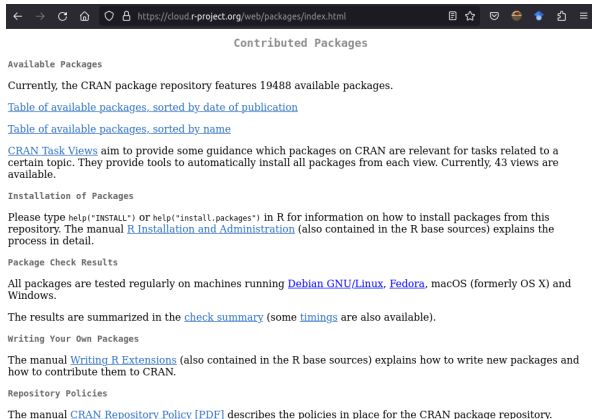


Figure 2: CRAN

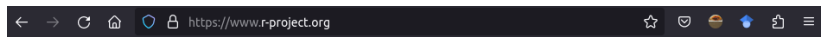
{Source: <https://cloud.r-project.org/web/packages/index.html>, as of 09/5/2023.}

Section 2

R and RStudio

R Installation

R @ <https://cran.r-project.org/>



The R Project for Statistical Computing

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R Foundation

Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To [download R](#), please choose your preferred [CRAN mirror](#).

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.

News

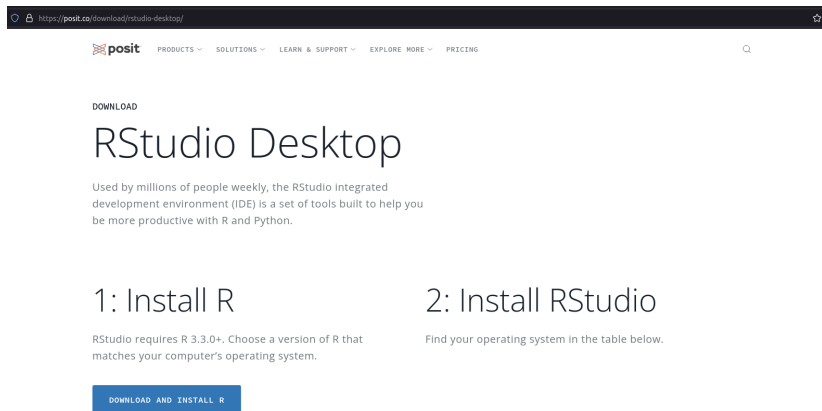
- [R version 4.3.0 \(Already Tomorrow\)](#) has been released on 2023-04-21.
- [R version 4.2.3 \(Shortstop Beagle\)](#) has been released on 2023-03-15.
- You can support the R Foundation with a renewable subscription as a [supporting member](#)

News via Twitter

[News from the R Foundation](#)

RStudio Installation

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



The screenshot shows the RStudio Desktop download page. At the top is a dark browser address bar with the URL <https://posit.co/download/rstudio-desktop/>. Below the address bar is a navigation bar with the Posit logo and links for PRODUCTS, SOLUTIONS, LEARN & SUPPORT, EXPLORE MORE, and PRICING. The main heading is "DOWNLOAD" followed by "RStudio Desktop". A paragraph describes RStudio as an integrated development environment (IDE) used by millions of people weekly. Below this are two columns: "1: Install R" and "2: Install RStudio". The "1: Install R" column contains text about RStudio requiring R 3.3.0+ and a blue button labeled "DOWNLOAD AND INSTALL R". The "2: Install RStudio" column contains text about finding the operating system in a table below.

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

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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.

1: Install R

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

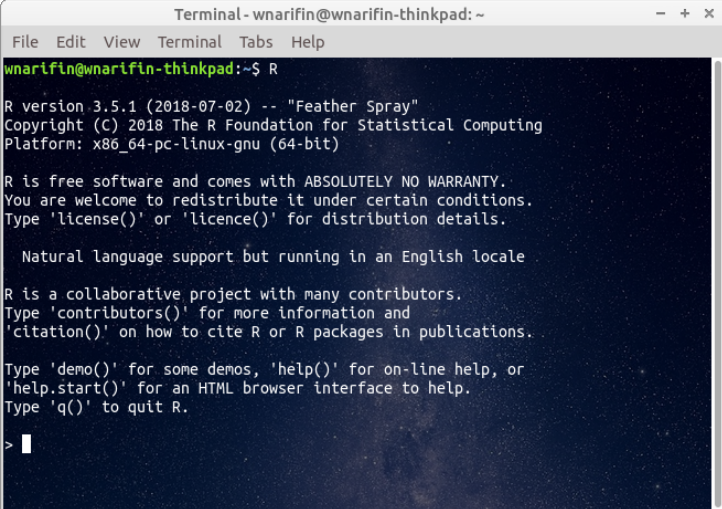
[DOWNLOAD AND INSTALL R](#)

2: Install RStudio

Find your operating system in the table below.

Figure 4: RStudio

R Interface

A terminal window titled "Terminal - wnarifin@wnarifin-thinkpad: ~" with standard window controls. The terminal shows the command "R" being executed, which displays the R version 3.5.1 splash screen. The text in the terminal is as follows:

```
wnarifin@wnarifin-thinkpad:~$ R

R version 3.5.1 (2018-07-02) -- "Feather Spray"
Copyright (C) 2018 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.

  Natural language support but running in an English locale

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.

> |
```

Figure 5: Plain R

RStudio Interface

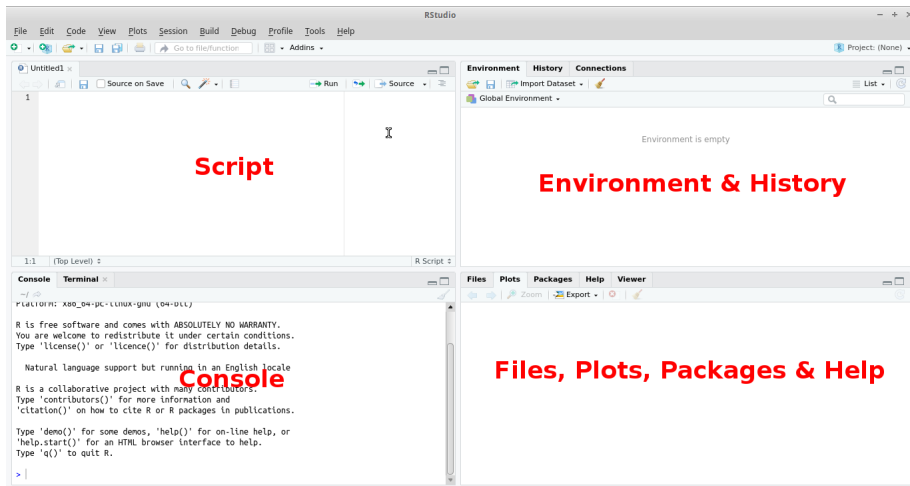


Figure 6: RStudio

Section 3

R script

File > New file > R script

- type all commands/functions here
- comments, start with “#”
- run all commands by Ctrl+Enter

Section 4

Function and Object

- R function(), think of MS Excel function
- structure

```
function(argument1 = value, argument2 = value)
```

Object

- name assigned on left side of “<-” / “=”
- variable, data (data frame, matrix, list)

```
x <- 1
y = 2
z = x + y
z # type object name, you'll get the value
```


Section 5

R packages

Install packages a.k.a libraries

- Graphically

Packages > Install

- Command

e.g. psych, car

```
install.packages("psych")  
install.packages("car")
```

Load libraries

e.g. load psych and car,

```
library(psych)  
library(car)
```

Section 6

Working directory

Set working directory

- 1 Browse to target directory: **Files Tab > ... > Go To Folder**
- 2 **Files Tab > More > Set As Working Directory**

Section 7

Help

If you know the name of packages/functions,

```
?psych
```

```
?library
```

Search by keywords,

```
??mean
```

```
??survey
```

- R Core Team. (2018). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Revelle, W. (2023). *Psych: Procedures for psychological, psychometric, and personality research*. Retrieved from <https://personality-project.org/r/psych/>
<https://personality-project.org/r/psych-manual.pdf>