

# Introduction to R and RStudio IDE

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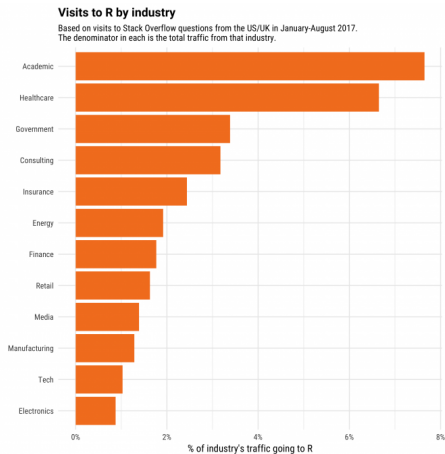
## Section 1

# 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/>

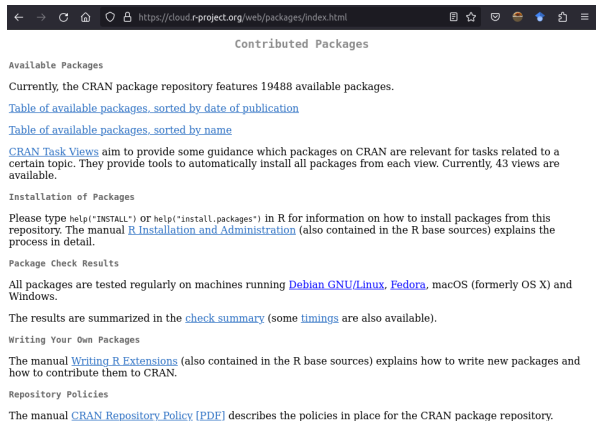
# R is getting more popular among academician



**Figure 1:** Impressive growth of R

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

# Availability of R packages



The screenshot shows a web browser window with the address bar displaying `https://cloud.r-project.org/web/packages/index.html`. The page title is "Contributed Packages". The content is organized into several sections:

- Available Packages**: States that the CRAN repository features 19488 available packages. It includes two links: [Table of available packages, sorted by date of publication](#) and [Table of available packages, sorted by name](#).
- CRAN Task Views**: Explains that these aim to provide guidance on relevant packages for specific tasks, with 43 views currently available.
- Installation of Packages**: Instructs users to type `help("INSTALL")` or `help("install.packages")` in R. It references the manual [R Installation and Administration](#).
- Package Check Results**: Notes that all packages are tested on machines running [Debian GNU/Linux](#), [Fedora](#), macOS (formerly OS X), and Windows. It points to a [check summary](#) and mentions that [timings](#) are also available.
- Writing Your Own Packages**: Refers to the manual [Writing R Extensions](#) for instructions on writing and contributing packages to CRAN.
- Repository Policies**: Points to the manual [CRAN Repository Policy \[PDF\]](#) for details on repository policies.

**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](#)

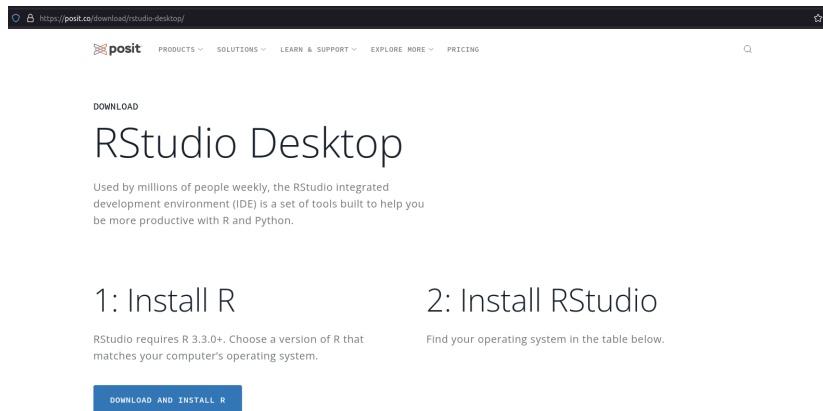
## News via Twitter

[News from the R Foundation](#)



# RStudio Installation

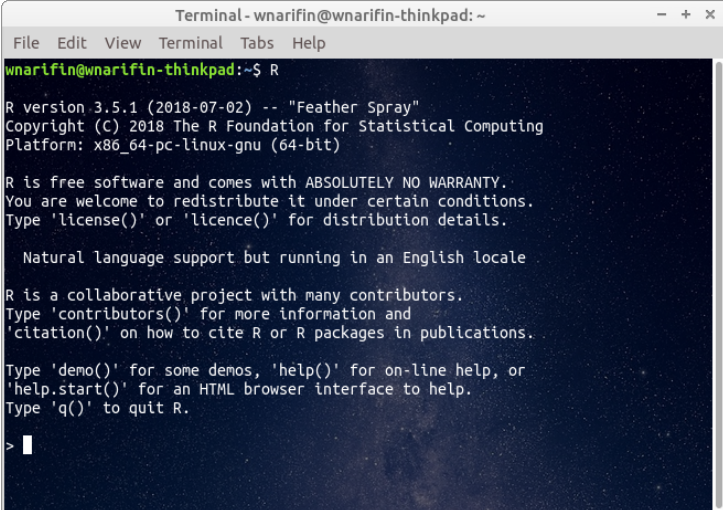
RStudio @ <https://posit.co/download/rstudio-desktop/>



The screenshot shows the RStudio Desktop download page. At the top, there is a navigation bar with the Posit logo and menu items: PRODUCTS, SOLUTIONS, LEARN & SUPPORT, EXPLORE MORE, and PRICING. Below the navigation bar, the word "DOWNLOAD" is displayed in a smaller font. The main heading is "RStudio Desktop". Underneath, 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." There are two main sections: "1: Install R" and "2: Install RStudio". Under "1: Install R", it says "RStudio requires R 3.3.0+. Choose a version of R that matches your computer's operating system." Below this is a blue button that says "DOWNLOAD AND INSTALL R". Under "2: Install RStudio", it says "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. The output displays the R version (3.5.1), copyright information (© 2018 The R Foundation for Statistical Computing), platform (x86\_64-pc-linux-gnu), and a series of introductory messages about the software's warranty, language support, and available help functions. The prompt ">" is visible at the bottom.

```
Terminal - wnarifin@wnarifin-thinkpad: ~
File Edit View Terminal Tabs Help
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

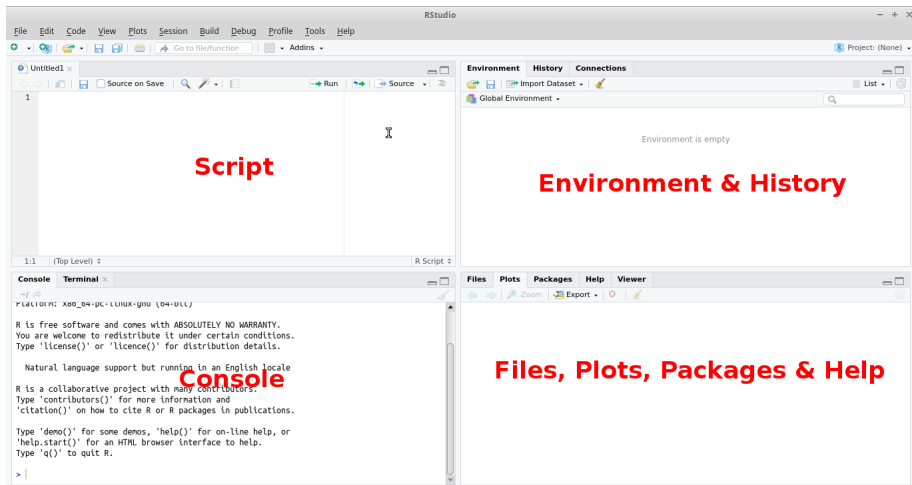


Figure 6: RStudio

## 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
```

# References

- 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>