



Introducción a R Studio[®]

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<https://cran.itam.mx>



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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](#)
- [Download R for \(Mac\) OS X](#)
- [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.

Source Code for all Platforms

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!

- The latest release (2020-10-10, Bunny-Wunnies Freak Out) [R-4.0.3.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](#).
- Contributed extension [packages](#)

Questions About R

- 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.

What are R and CRAN?

R is ‘GNU S’, a freely available language and environment for statistical computing and graphics which provides a wide variety of statistical and graphical techniques: linear and nonlinear modelling, statistical tests, time series analysis, classification, clustering, etc. Please consult the [R project homepage](#) for further information.

Según sea el sistema operativo, será distinta la instalación de R. Afortunadamente existen múltiples blogs y páginas con instrucciones paso a paso para la instalación.





<https://rstudio.com/products/rstudio/download/>

All Installers

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

RStudio requires a 64-bit operating system. If you are on a 32 bit system, you can use an [older version of RStudio](#).

OS	Download	Size	SHA-256
Windows 10/8/7	 RStudio-1.3.1093.exe	171.62 MB	62b9e60a
macOS 10.13+	 RStudio-1.3.1093.dmg	148.66 MB	bdc4d3a4
Ubuntu 16	 rstudio-1.3.1093-amd64.deb	124.33 MB	72f05048
Ubuntu 18/Debian 10	 rstudio-1.3.1093-amd64.deb	126.80 MB	ff222177
Fedora 19/Red Hat 7	 rstudio-1.3.1093-x86_64.rpm	146.96 MB	ed1f6ef8
Fedora 28/Red Hat 8	 rstudio-1.3.1093-x86_64.rpm	151.05 MB	01a978f3
Debian 9	 rstudio-1.3.1093-amd64.deb	127.00 MB	a747f9f9
SLES/OpenSUSE 12	 rstudio-1.3.1093-x86_64.rpm	119.43 MB	5016cbcfc
OpenSUSE 15	 rstudio-1.3.1093-x86_64.rpm	128.40 MB	cf47e32d

Descargar el paquete que corresponda a nuestro sistema operativo





<https://rstudio.com/products/rstudio/download/preview/>

Desktop Version

Installers	Size	Date	SHA-256
RStudio 1.4.1081 - Ubuntu 18/Debian 10 (64-bit)	120.61 MB	2020-12-05	edb4cef2
RStudio 1.4.1081 - Fedora 28/Red Hat 8 (64-bit)	137.99 MB	2020-12-05	a6b7340e
RStudio 1.4.1081 - Debian 9 (64-bit)	120.88 MB	2020-12-05	930b1962
RStudio 1.4.1081 - macOS 10.13+ (64-bit)	152.78 MB	2020-12-05	b85d0b08
RStudio 1.4.1081 - OpenSUSE 15 (64-bit)	122.00 MB	2020-12-05	05da2c25
RStudio 1.4.1081 - Fedora 19/Red Hat 7 (64-bit)	138.01 MB	2020-12-05	22fdfcb4
RStudio 1.4.1081 - Windows 10/8/7 (64-bit)	156.95 MB	2020-12-05	0e660740
RStudio 1.4.1081 - Ubuntu 16 (64-bit)	119.96 MB	2020-12-05	1f0484bf



También podemos descargar la versión 1.4 en desarrollo



1 • **Consola de R**

R version 4.0.3 (2020-10-10) -- "Bunny-Wunnies Freak Out"
 Copyright (C) 2020 The R Foundation for Statistical Computing
 Platform: x86_64-apple-darwin17.0 (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.

2

- Datos en el ambiente
- Historial
- Git

3

- Plots
- Archivos
- Ayuda
- Paqueterías

Una vez instalado RStudio podemos tener acceso a la versión R instalada en nuestro sistema operativo. Esto es lo que se observa al abrir RStudio. El Yoda y la “frase” se configuran de una manera muy particular, puedes aprender de ello en el curso **“Best practices for bioinformatics workflows using R, RStudio, Git, and GitHub”**, pregunta a los organizadores por él.





The screenshot shows the RStudio interface. The top menu bar includes 'File', 'Edit', 'Code', 'View', 'Plots', 'Session', 'Build', 'Debug', 'Profile', 'Tools' (which is selected), 'Window', and 'Help'. The 'Tools' menu is open, displaying options like 'Install Packages...', 'Check for Package Updates...', 'Version Control', 'Shell...', 'Terminal', 'Jobs', 'Addins', 'Keyboard Shortcuts Help', 'Modify Keyboard Shortcuts...', 'Show Command Palette', 'Project Options...', and 'Global Options...'. The 'Global Options...' option is highlighted with a blue selection bar. The main workspace shows R version 4.0.3 starting up, followed by a standard R welcome message. Below this, there is a large, faint ASCII art watermark of a rabbit (Bunny-Wunnies) in the center of the screen, which is a well-known feature of the RStudio IDE.



Las opciones globales nos permitirán cambiar aspectos visuales de la organización de la interfaz gráfica. Para fines prácticos por tiempo, solo nos enfocaremos en estas opciones.



The screenshot shows the RStudio interface with the 'Options' dialog box open. The 'Basic' tab is selected in the 'R Sessions' section. The 'Restore most recently opened project at startup' checkbox is checked and highlighted with a blue border. The 'Restore previously open source documents at startup' checkbox is unchecked. In the 'Workspace' section, the 'Restore .RData into workspace at startup' checkbox is unchecked and highlighted with a blue border. A dropdown menu 'Save workspace to .RData on exit:' is set to 'Ask'. The 'History' section contains two checked checkboxes: 'Always save history (even when not saving .RData)' and 'Automatically notify me of updates to RStudio'. The 'Other' section contains three checked checkboxes: 'Wrap around when navigating to previous/next tab', 'Automatically notify me of updates to RStudio', and 'Send automated crash reports to RStudio'. The 'Environment' tab in the top right shows 'Environment is empty'. The bottom right corner of the RStudio window has a small icon with a red 'X' and a green checkmark.

Al quitar las “palomitas” de los pequeños cuadros de las opciones generales señaladas en los recuadros azules, nos aseguramos que no se gaste memoria temporal al guardar datos o código de sesiones anteriores.





RStudio interface showing the R version 4.0.3 startup message and the Options dialog box.

Console Output:

```
R version 4.0.3 (2020-10-10) -- "Bunny-Wunnies Freak Out"
Copyright (C) 2020 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin17.0 (64-bit)

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R is a collaborative project with many
Type 'contributors()' for more information
'citation()' on how to cite R or R packages
Type 'demo()' for some demos, 'help()'
'help.start()' for an HTML browser interface
Type 'q()' to quit R.

-----
¿Quieres saber la diferencia entre un maestro y un principiante lo ha intentado.
-----
```

Options Dialog (Display Tab):

- General:**
 - Highlight selected word
 - Highlight selected line
 - Show line numbers
 - Show margin Margin column 80
 - Show whitespace characters
 - Show indent guides
 - Blinking cursor
 - Allow scroll past end of document
 - Allow drag and drop of text
 - Highlight R function calls
 - Rainbow parentheses
- Fold Style: Start and End

Buttons: OK, Cancel, Apply

v1.4 (highlighted with a blue arrow)

Diagram: A small diagram showing a sequence of colored parentheses: red, orange, yellow, green, blue, purple, red, orange, yellow, green, blue, purple.

En la versión en desarrollo 1.4, se pueden activar los paréntesis con colores de arcoíris.
Esto es muy útil a la hora de generar funciones o hacer subsetting.





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 Type 'q()' to quit R.

*¿Quieres saber la diferencia entre un m
 el principiante lo ha intentado.*

```
# plotting of R objects
plot <- function (x, y, ...)
{
  if (is.function(x) &&
      is.null(attr(x, "class")))
  {
    if (missing(y))
      y <- NULL

    # check for ylab argument
    hasylab <- function(...)
      !all(is.na(
        pmatch(names(list(...)),
              "ylab")))

    if (hasylab(...))
      plot.function(x, y, ...)

    else
      plot.function(
        x, y,
        ylab = paste(
          deparse(substitute(x)),
          "(x)"),
        ...)

  } else
    UseMethod("plot")
}
```

Environment is empty

Console Terminal Jobs

Console Environment History Connections Tutorial

Import Dataset Global Environment

General Code Console Appearance Pane Layout Packages R Markdown Sweave Spelling Git/SVN Publishing Terminal Accessibility Python

RStudio theme: Modern Zoom: 100% Editor font: Monaco Editor font size: 11

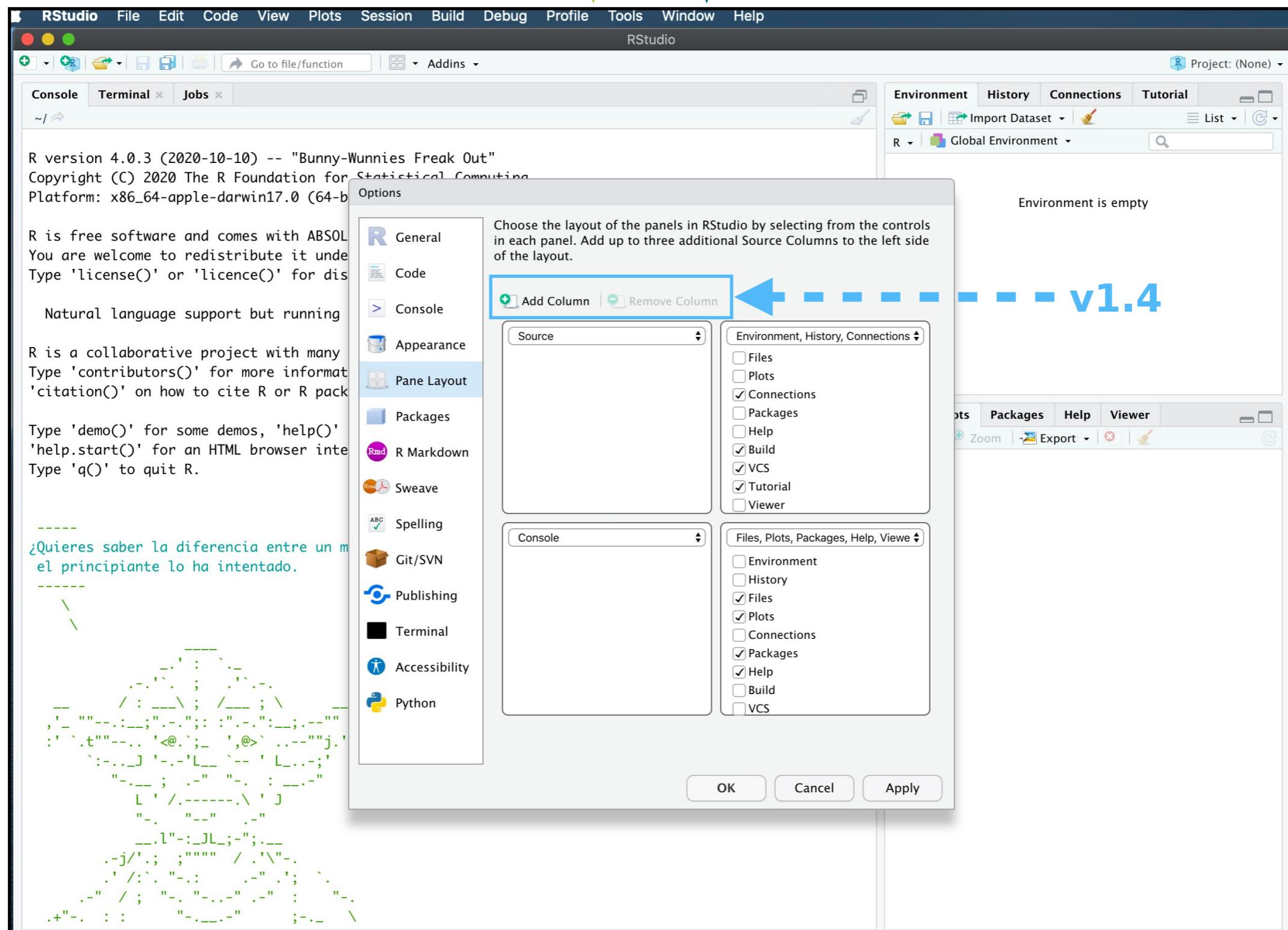
Editor theme: Merbivore Soft Mono Industrial Monokai Pastel On Dark Solarized Dark Solarized Light SQL Server Textmate (default) Tomorrow Tomorrow Night Tomorrow Night 80s Tomorrow Night Blue Tomorrow Night Bright Twilight Vibrant Ink Xcode

Add... Remove OK Cancel Apply

Global Options → Appearance

En esta opción podemos definir el color, letra y tamaño de nuestro editor de código. De esta manera personalizarlo a nuestras necesidades o gustos.





Podemos cambiar la distribución de los paneles. En la v1.4 podemos añadir una columna de editor de código, muy útil para el desarrollo de paqueterías y la comparación de código.





The screenshot shows the RStudio interface with the 'File' menu open, displaying options like 'New File', 'Open File...', and 'Save'. The 'New File' submenu is highlighted, showing various file types. The main workspace shows an empty 'Environment' tab and a file browser on the right containing files like '.gitignore', '.httr-oauth', '.RData', and 'Alzheimer pathways.png'.

En RStudio podemos generar todos los archivos enlístados en “New File”. El archivo más usado para desarrollar código en R es “R Script”. Aún así RStudio nos permite hacer reportes de nuestros código con “R Notebook y R Markdown”, aplicaciones web con “Shiny Web App”, generar APIs con “Plumber API”, editar código en HTML, C, C++, Python, CSS, JavaScript, Shell, entre otros. Pregunta a los organizadores cómo optimizar tu trabajo trabajando con RProject en RStudio.





RStudio File Edit Code View Plots Session Build Debug Profile Tools Window Help

Go to file/function Addins Project: (None)

Untitled1 x Source on Save Run Source

1

4

● Editor de código

Environment History Connections Tutorial

Import Dataset Global Environment

2

- Datos en el ambiente
- Historial
- Git

Files Plots Packages Help Viewer

New Folder Delete Rename More

Home

	Name	Size	Modified
■	.gitignore	12 B	Jul 2, 2020
■	.httr-oauth	0 B	Jul 2, 2020
■	.r		
■	.RData	2.5 KB	Nov 13, 2020
■	.Renviron	17 B	Aug 5, 2020
■	.Rhistor	1 KB	Nov 13, 2020
■	.Rprofile	583 B	Aug 7, 2020
■	Alzheimer_naturalways.png	6069 KB	Jul 19, 2020
■	anaconda3		
■	Applications		
■	bbl		
■	Bits_o_LTC		
■	CDSB2020_minirepo		
■	CDSB2020minirepo		
■	CellDesignerSim		
■	CmapToolsLogs		
■	Correlation_plot_datatraining.png	53.5 KB	Feb 27, 2021
■	CriptoDummy		
■	CytoscapeConfiguration		

3

● Plots
● Archivos
● Ayuda
● Paquetterías

1

Console Terminal Jobs

1:1 (Top Level) R Script

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Al abrir un nuevo “R Script”, así se distribuye por default RStudio





RStudio File Edit Code View Plots Session Build Debug Profile Tools Window Help RStudio Addins Project: (None)

Untitled2 x Untitled1* x Environment History Connections Tutorial Import Dataset List Global Environment Search

Environment is empty

Options

v1.4

Choose the layout of the panels in RStudio by selecting from the controls in each panel. Add up to three additional Source Columns to the left side of the layout.

Add Column Remove Column

Source Add column Environment, History, Conn

Environment
 History
 Files
 Plots
 Connections
 Packages
 Help
 Build
 VCS

Console Files, Plots, Packages, Help

Environment
 History
 Files
 Plots
 Connections
 Packages
 Help
 Build
 VCS

OK Cancel Apply

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les Plots Packages Help Viewer

New Folder Delete Rename More

Home Name Size Modified

Name	Size	Modified
.gitignore	12 B	Jul 2, 2018,
.httr-oauth	0 B	Jul 2, 2018,
.r		
.RData	2.5 KB	Nov 13, 2018
.Renviron	17 B	Aug 5, 2020
.Rhistory	1 KB	Nov 13, 2018
.Rprofile	583 B	Aug 7, 2020
Alzheimer pathways.png	306.9 KB	Jul 19, 2018
anaconda3		
Applications		
bbb		
Bitso_LTC		
CDSB2020_minirepo		
CDSB2020minirepo		
CellDesignerSim		
CmapToolsLogs		
Correlation_plot_datatraining.png	53.5 KB	Feb 27, 2018
CriptoDummy		
CytoscapeConfiguration		

1:1 (Top Level) R Script

Y de esta manera en la v1.4 se puede añadir una nueva columna para editar código





The screenshot shows the RStudio interface with a dark theme. It features two code editors at the top, both titled "Untitled1" and "Untitled2". The left editor contains the text "v1.4". Below the editors is a console window displaying the R startup message:

```
R version 4.0.3 (2020-10-10) -- "Bunny-Wunnies  
Freak Out"  
Copyright (C) 2020 The R Foundation for Statistical Computing  
Platform: x86_64-apple-darwin17.0 (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.
```

To the right of the console is a file browser titled "Files" showing the contents of the current directory:

Name	Size	Modified
.gitignore	12 B	Jul 2, 2018,
.httr-oauth	0 B	Jul 2, 2018,
.r		
.RData	2.5 KB	Nov 13, 2018
.Renviron	17 B	Aug 5, 2020
.Rhistory	1 KB	Nov 13, 2018
.Rprofile	583 B	Aug 7, 2020
Alzheimer pathways.png	306.9 KB	Jul 19, 2018
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CDSB2020_minirepo		
CDSB2020minirepo		
CellDesignerSim		
CmapToolsLogs		
Correlation_plot_datatraining.png	53.5 KB	Feb 27, 2018
CriptoDummy		
CytoscapeConfiguration		

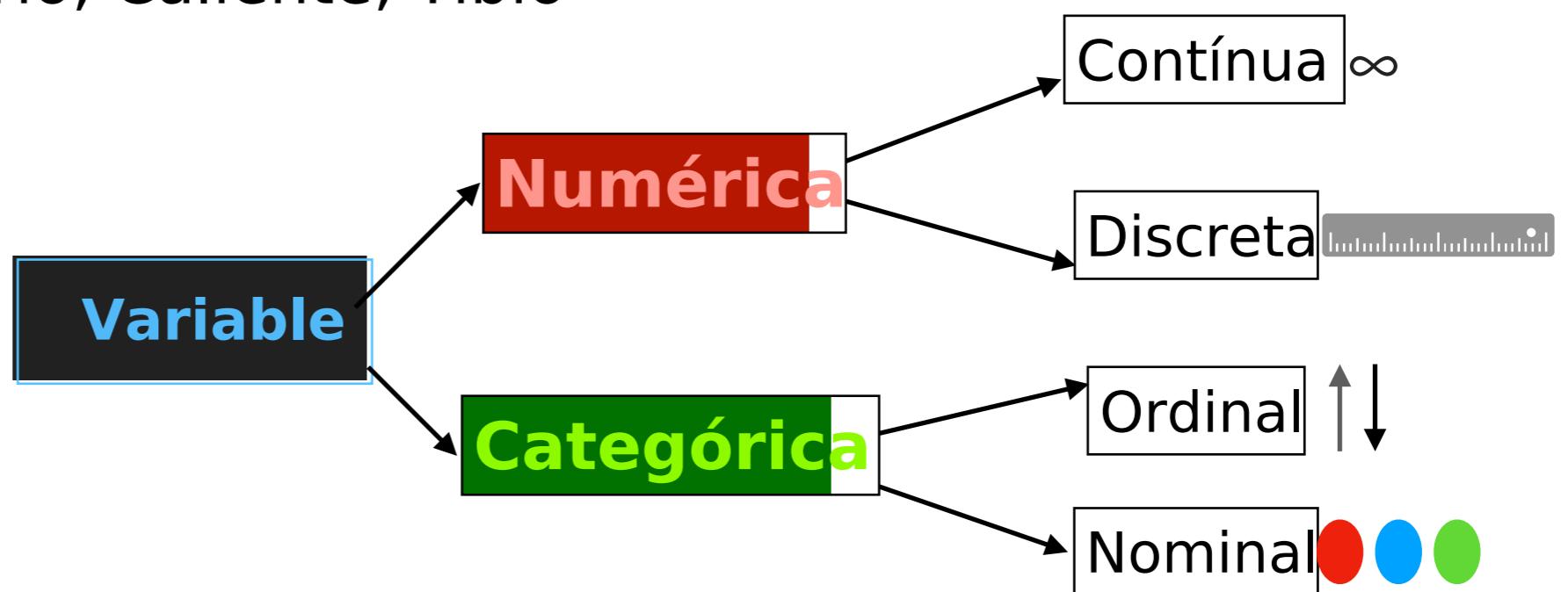


Y ahora así se distribuyen los paneles al agregar una columna.



Tipos de variables

- **Lógicos** : TRUE FALSE
- **Numéricos** : Enteros (25L, -5L) y dobles (3.1416, 25.0)
- **Carácter** o cadena : “a”, “abcd”
- **Factor** : Frío, Caliente, Tibio





Manos a la obra

- Cambia el tema del editor de código a “Pastel On Dark”
- Genera un archivo R script nuevo, y guárdalo como “tipo de variables”.
- ¿Qué sucede al usar **Shift** + **ctrl/command** + **P** ?
- ¿Qué sucede al sumar FALSE + 4? ¿y TRUE + 4?





Algunos atajos útiles

ctrl/command + Shift + C = Comentar líneas de código

Alt + Click = Indice de mouse en multiples líneas

Alt + - = <->

ctrl/command + ENTER = Ejecutar linea de código

ctrl/command + Shift + M = %>%

Shift + ctrl/command + K = Compilar en reporte





abs	Valor absoluto
ceiling	Entero mayor o igual
cos	Coseno
dim	Dimensión de una Matriz
exp	Exponencial
floor	Entero menor o igual
log10	Logaritmo decimal
log	Logaritmo Neperiano
max	Máximo
mean	Media
median	Mediana
min	Mínimo
order	Vector entero en orden creciente
prod	Producto
range	Rango
rev	Elementos ordenados inversamente
sample	Generar muestras aleatorias
sin	Seno
sort	Elementos ordenados ascendentemente
sqrt	Raíz cuadrada
summary	Resumen estadístico de un objeto
sum	Suma
tan	Tangente
trunc	Entero más próximo a cero
var	Varianza de un vector o matrices





Material Extra

[**R for Beginners - Emmanuel Paradis**](#)

[**R tutorial beginners**](#)

[**R para Ciencia de Datos - Garret Grolemund & Hadley Wickham**](#)

¡No te pierdas los mini cursos de cada mes!
MUCHAS GRACIAS

