R e RStudio

Ricardo Theodoro

OBSCOOP/USP

O que é o R?

- R é uma linguagem de programação voltada para estatística, desenvolvida por dois pesquisadores do departamento de Estatística da Universidade Auckland, na Nova Zelândia.
- Ela surgiu da necessidade de um programa que auxiliasse na manipulação, análise e visualização de dados de forma gratuíta para que os alunos pudessem acompanhar as aulas.
- Apesar de ser voltada para estatística, possui uma infinidade de funções, como criação de sites, dashboards, etc...

Onde baixar o R?

The Comprehensive R Archive Network - https://cran.r-project.org/

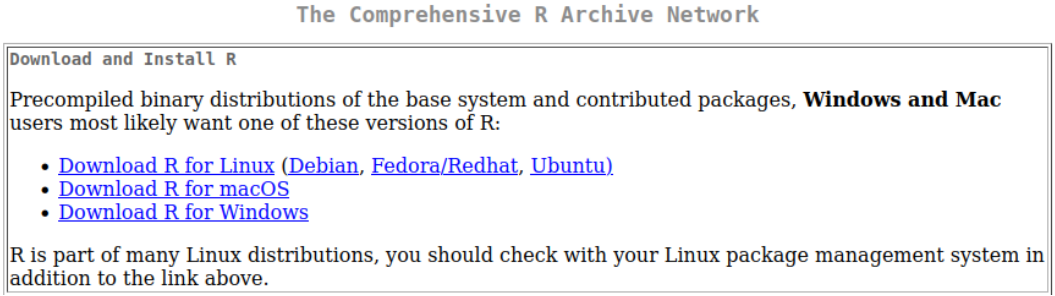


Figure 1: CRAN

Instalando R no Linux

Install R

Package for the *current R 4.2.* release* are available for most stable Desktop releases of Ubuntu until their official end of life date. However, only the latest Long Term Support (LTS) release is fully supported. As of May 2, 2022 the supported releases are

- Jammy Jellyfish (22.04, amd64 only)
- Impish Indri (21.10, amd64 only),
- Focal Fossa (20.04; LTS and amd64 only),
- Bionic Beaver (18.04; LTS), and
- Xenial Xerus (16.04; LTS).

Run these lines (if `root`, remove `sudo`) to tell Ubuntu about the R binaries at CRAN.

```
# update indices
sudo apt update -qq
# install two helper packages we need
sudo apt install --no-install-recommends software-properties-common dirmngr
# add the signing key (by Michael Rutter) for these repos
# To verify key, run gpg --show-keys /etc/apt/trusted.gpg.d/cran_ubuntu_key.asc
# Fingerprint: E298A3A825C0D65DFD57CBB651716619E084DAB9
wget -qO- https://cloud.r-project.org/bin/linux/ubuntu/marutter_pubkey.asc | sudo tee -a /etc/a
# add the R 4.0 repo from CRAN -- adjust 'focal' to 'groovy' or 'bionic' as needed
sudo add-apt-repository "deb https://cloud.r-project.org/bin/linux/ubuntu $(lsb_release -cs)-cr
```

Here we use `lsb_release -cs` to access which Ubuntu flavor you run: one of “jammy”, impish”, “focal”, “bionic”, ...

Instalando R no Mac

Latest release:

R-4.2.1.pkg (notarized and signed)
SHA1-hash: f83a6c96cedd19193255f94cb01381a273073a3a
(ca. 90MB) for Intel Macs

R 4.2.1 binary for macOS 10.13 (**High Sierra**) and higher, **Intel 64-bit** build, signed and notarized package.
Contains R 4.2.1 framework, R.app GUI 1.79 in 64-bit for Intel Macs, Tcl/Tk 8.6.6 X11 libraries and Texinfo 6.7. The latter two components are optional and can be ommitted 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 (version 2.7.11 or later) since it is no longer part of macOS. Always re-install XQuartz when upgrading your macOS to a new major version.

This release supports Intel Macs, but it is also known to work using Rosetta2 on M1-based Macs. For native Apple silicon arm64 binary see below.

Important: this release uses Xcode 12.4 and GNU Fortran 8.2. If you wish to compile R packages from sources, you may need to download GNU Fortran 8.2 - see the tools directory.

Figure 3: CRAN

Instalando R no Windows

Download R-4.2.1 for Windows (79 megabytes, 64 bit)

README on the Windows binary distribution
New features in this version

This build requires UCRT, which is part of Windows since Windows 10 and Windows Server 2016. On older systems, UCRT has to be installed manually from here.

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.

Frequently asked questions

- Does R run under my version of Windows?
- How do I update packages in my previous version of 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.html.

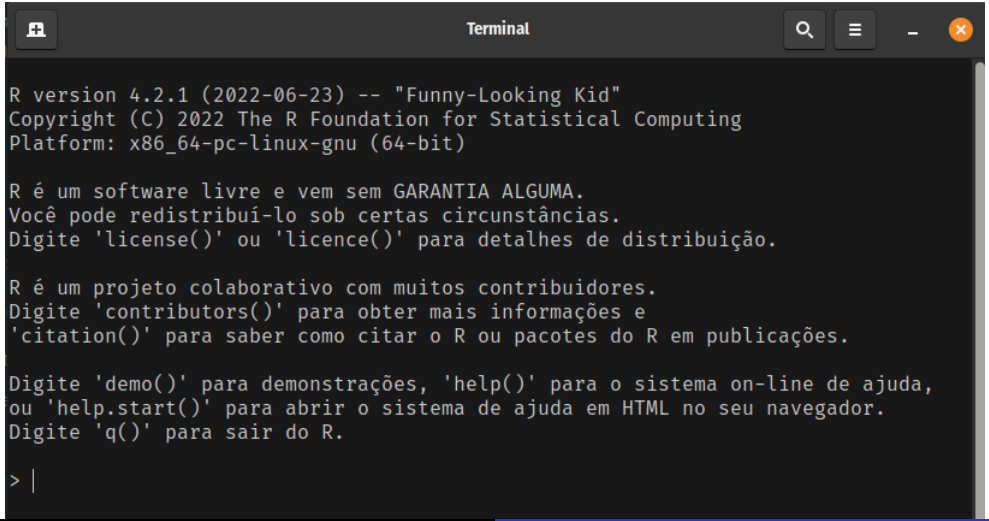
Abrindo o R

Ícone do R:

Figure 5: Ícone R

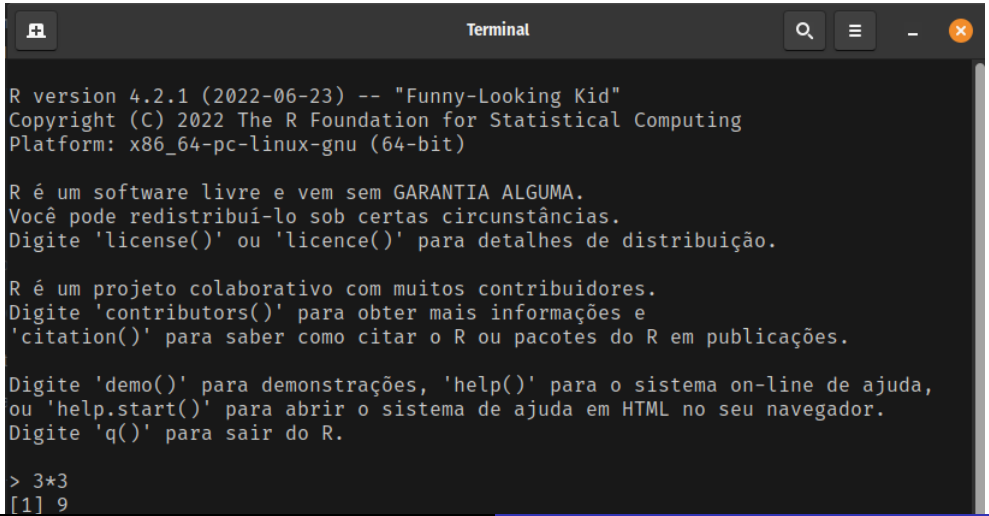
Abrindo o R

Tela do R:



Abrindo o R

Poucas informações, pouco intuítivo, feio



O que é o RStudio?

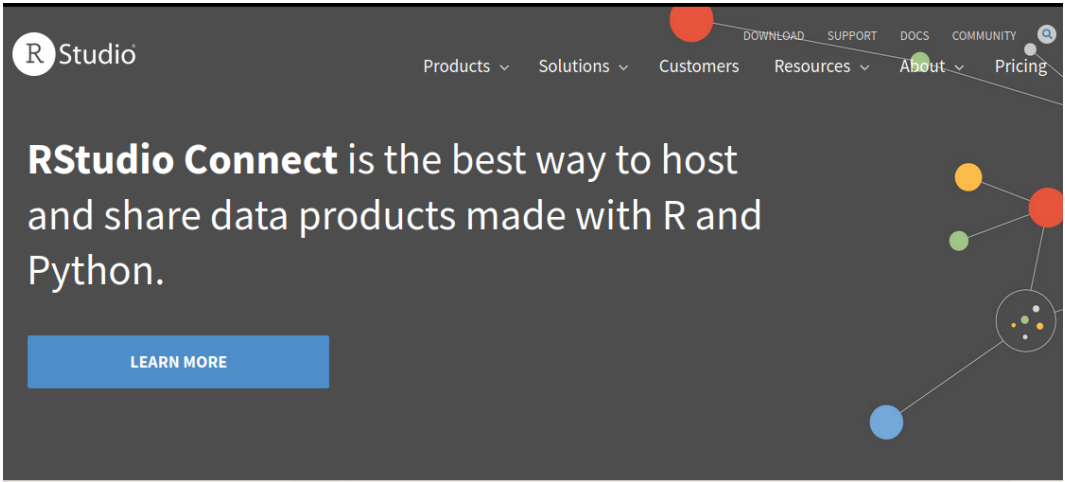
- É uma interface gráfica voltada para programação em R
- Utiliza de recursos visuais para facilitar a programação
- Também aceita outras linguagens, como Python

Outras interfaces:

- VSCODE
- Jupyter

Onde baixar o RStudio?

RStudio - https://www.rstudio.com/



Onde baixar o RStudio?

- Download
- Selecionar a versão RStudio Desktop (Free)

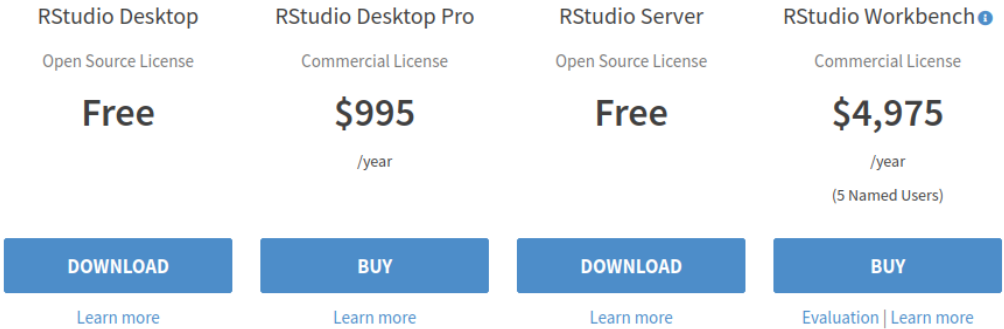


Figure 9: RStudio Desktop (Free)

Onde baixar o RStudio?

- Download
- Selecionar a versão RStudio Desktop (Free)

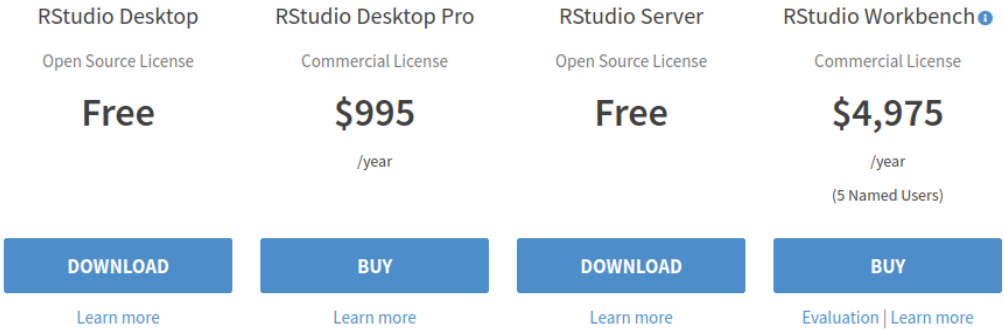


Figure 10: RStudio Desktop (Free)

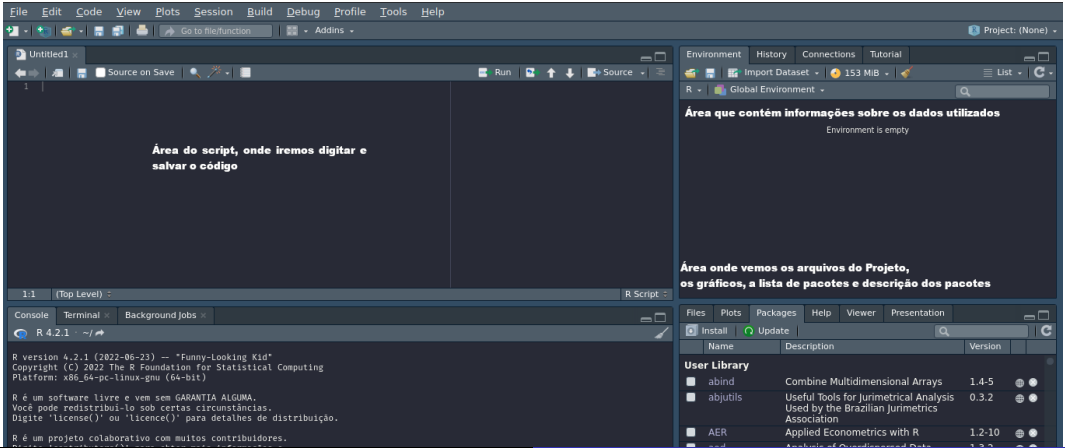
Onde baixar o RStudio?

- Selecionar o seu sistema
- Clickar em baixar
- Instalar

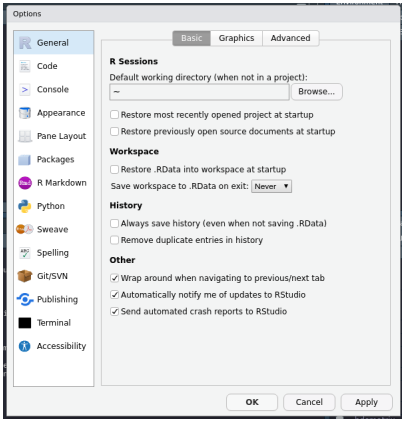
OS	Download	Size	SHA-256
Windows 10/11	RStudio-2022.07.1-554.exe	190.14 MB	5ab6215b
macOS 10.15+	RStudio-2022.07.1-554.dmg	221.04 MB	7b1a2285
Ubuntu 18+/Debian 10+	rstudio-2022.07.1-554-amd64.deb	132.91 MB	74b9e751
Ubuntu 22	rstudio-2022.07.1-554-amd64.deb	145.33 MB	92f2ab75
Fedora 19/Red Hat 7	rstudio-2022.07.1-554-x86_64.rpm	103.29 MB	0fc15d16
Fedora 34/Red Hat 8	rstudio-2022.07.1-554-x86_64.rpm	149.77 MB	0c4ef334
OpenSUSE 15	rstudio-2022.07.1-554-x86_64.rpm	133.76 MB	45f277d9

Interface básica do RStudio

- Dividida em quatro partes: Scripts, Console/Terminal, Ambiente/Conexões e Arquivos/Visualização



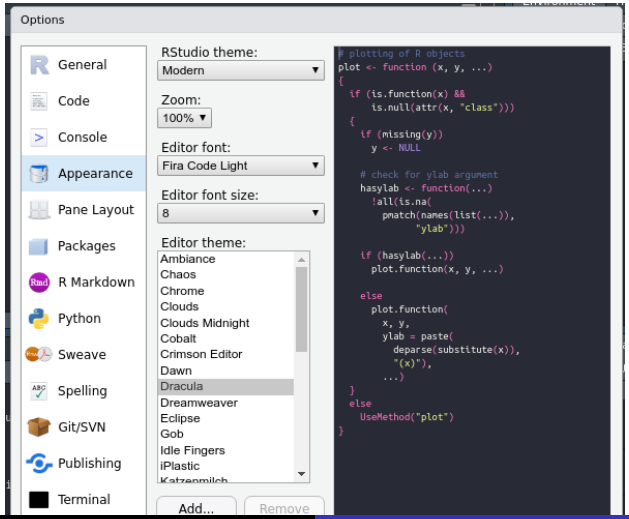
Configurando o RStudio



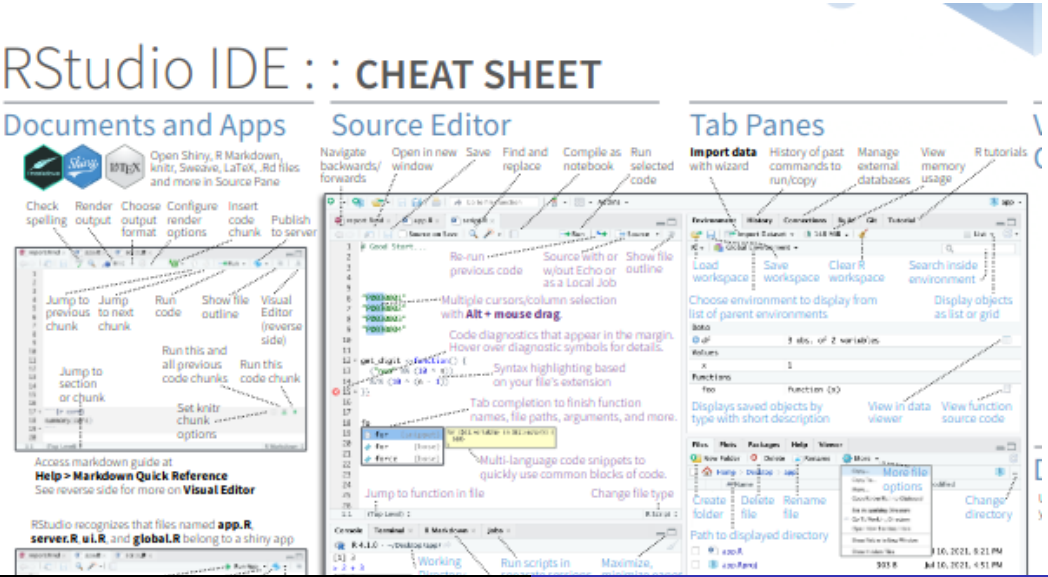
- Ler Zen do R
- Acessar: Ferramentas -> Opções Globais
- Não salvar o RData, histórico, etc...

Configurando a aparência

- Deixar do jeito que te agradar mais



Mais informações sobre Projetos



Operações básicas com o R no RStudio

Criar um script:

- File -> New File -> R Script (Ctrl+Shift+n)

```
# Soma
1 + 1
```

```
[1] 2
```

```
# Subtração
1 - 1
```

```
[1] 0
```

```
# Multiplicação
1 * 1
```

```
[1] 1
```

```
# Divisão
1 / 1
```

```
[1] 1
```

Criando variáveis

```
# Numérica
numero <- 1
numero
```

```
[1] 1
```

```
letra <- "a"
letra
```

```
[1] "a"
```

Criando vetores

```r
# Vetor numérico
numeros <- c(1, 2, 3)
numeros
```

```
[1] 1 2 3
```

```r
# Vetor de caracteres
letras <- c("a", "b", "c")
letras
```

```
[1] "a" "b" "c"
```

Criando um data.frame

```
tabela <- data.frame(letras = LETTERS[1:10],
                     numeros = seq(1:10))
tabela
```

```
   letras numeros
1       A       1
2       B       2
3       C       3
4       D       4
5       E       5
6       F       6
7       G       7
8       H       8
9       I       9
10      J      10
```

- Cada coluna é uma variável
- Cada linha é uma observação
- Cada célula é um valor