

Apresentar o programa R usando matemática e estatística aos alunos do Ensino Médio

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O que é R?



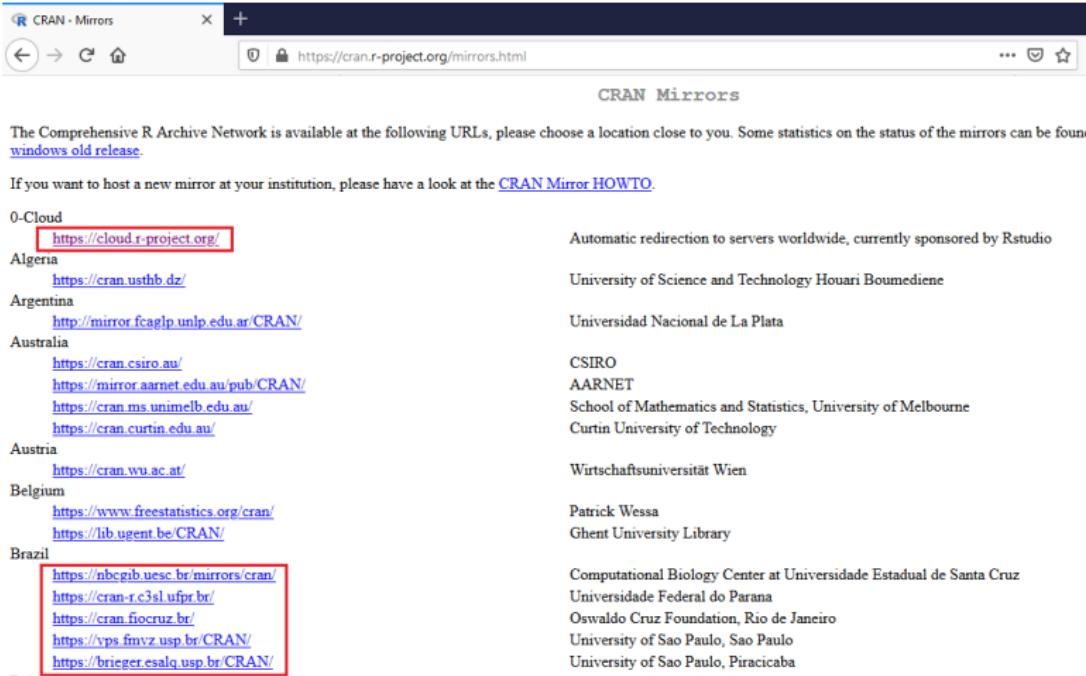
O que é R?

R é uma linguagem de programação voltada à manipulação, análise e visualização de dados. Ele tem diversas funções, desde uma calculadora científica, até a realização de complexas análises estatísticas.

Como fazer o download do R?

- Pelo site: <https://www.r-project.org/>

The screenshot shows the official website for The R Project for Statistical Computing. At the top, there is a navigation bar with icons for back, forward, search, and other functions. The URL in the address bar is <https://www.r-project.org/>. The main header features the R logo and the text "The R Project for Statistical Computing". Below the header, there is a "Getting Started" section with text about R being a free software environment for statistical computing and graphics. It mentions that R compiles and runs on various platforms and provides a link to download R from CRAN mirrors. There is also a "News" section with a note about the upcoming release of R version 4.0.0. The footer contains links to "About R", "Logo", "Contributors", and "What's New?", along with a "Privacy Policy" link.



The Comprehensive R Archive Network is available at the following URLs, please choose a location close to you. Some statistics on the status of the mirrors can be found [windows old release](#).

If you want to host a new mirror at your institution, please have a look at the [CRAN Mirror HOWTO](#).

0-Cloud
<https://cloud.r-project.org/> Automatic redirection to servers worldwide, currently sponsored by Rstudio

Algeria
<https://cran.usthb.dz/> University of Science and Technology Houari Boumediene

Argentina
<http://mirror.fcaglp.unlp.edu.ar/CRAN/> Universidad Nacional de La Plata

Australia
<https://cran.csiro.au/> CSIRO
<https://mirror.aarnet.edu.au/pub/CRAN/> AARNET
<https://cran.ms.unimelb.edu.au/> School of Mathematics and Statistics, University of Melbourne
<https://cran.curtin.edu.au/> Curtin University of Technology

Austria
<https://cran.wu.ac.at/> Wirtschaftsuniversität Wien

Belgium
<https://www.freestatistics.org/cran/> Patrick Wessa
<https://lib.ugent.be/CRAN/> Ghent University Library

Brazil
<https://nbcgib.uesc.br/mirrors/cran/> Computational Biology Center at Universidade Estadual de Santa Cruz
<https://cran-r.c3sl.ufpr.br/> Universidade Federal do Paraná
<https://cran.fiocruz.br/> Oswaldo Cruz Foundation, Rio de Janeiro
<https://ps.fmvz.usp.br/CRAN/> University of São Paulo, São Paulo
<https://brieger.esalq.usp.br/CRAN/> University of São Paulo, Piracicaba

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.

R for Windows

Subdirectories:

[base](#)

Binaries for base distribution. This is what you want to [install R for the first time](#).

[contrib](#)

Binaries of contributed CRAN packages (for R >= 2.13 x; managed by Uwe Ligges). There is also information on [third party software](#) available for CRAN Windows services and corresponding environment and make variables.

[old_contrib](#)

Binaries of contributed CRAN packages for outdated versions of R (for R < 2.13 x; managed by Uwe Ligges).

[Rtools](#)

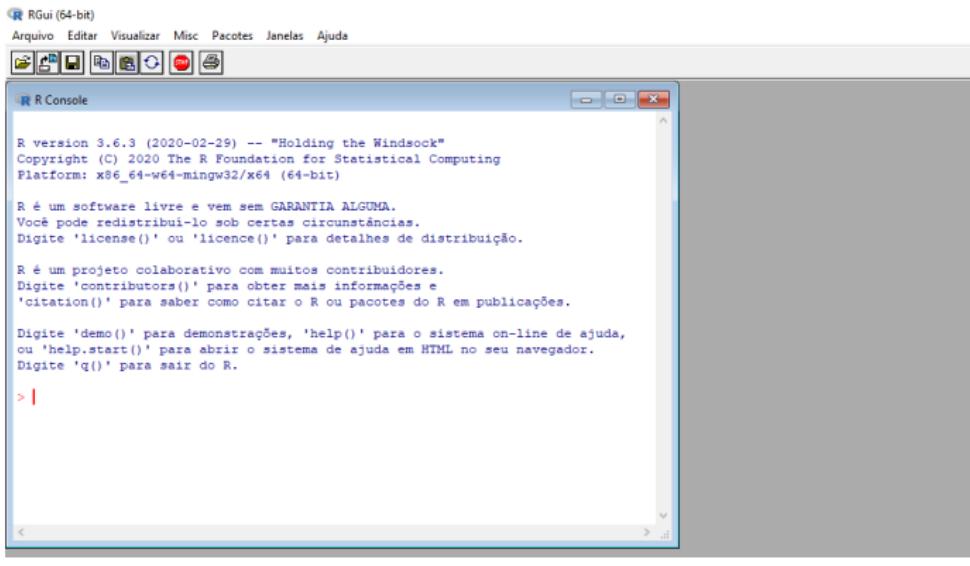
Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself.

Please do not submit binaries to CRAN. Package developers might want to contact Uwe Ligges directly in case of questions / suggestions related to Windo

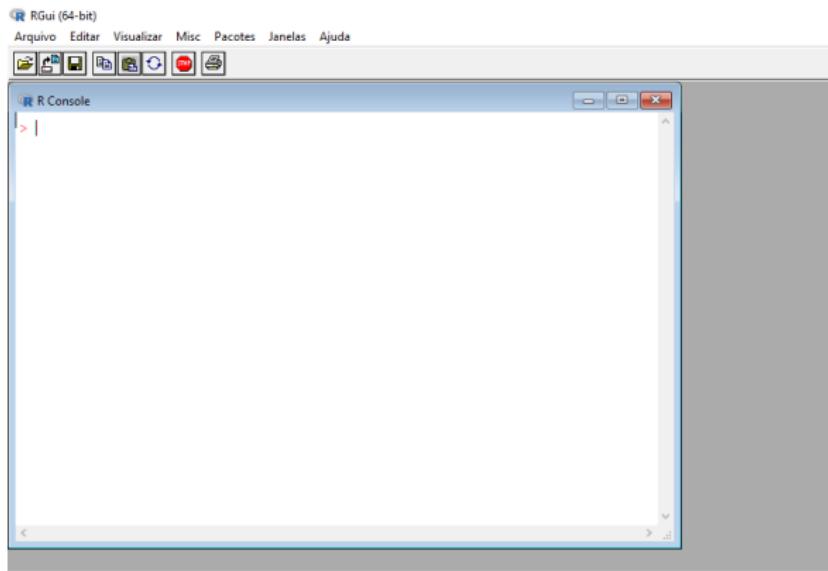
You may also want to read the [R FAQ](#) and [R for Windows FAQ](#).

Operações Básicas no R

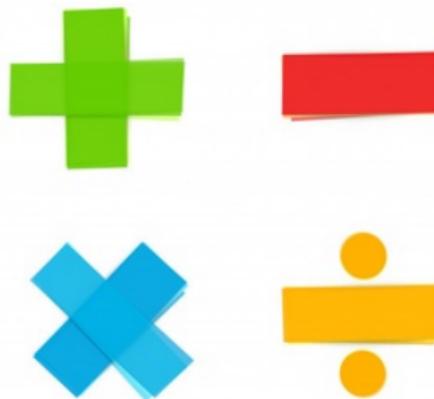
Tela Inicial do R.



Iniciamos com um “Ctrl + l” para limpar a tela.

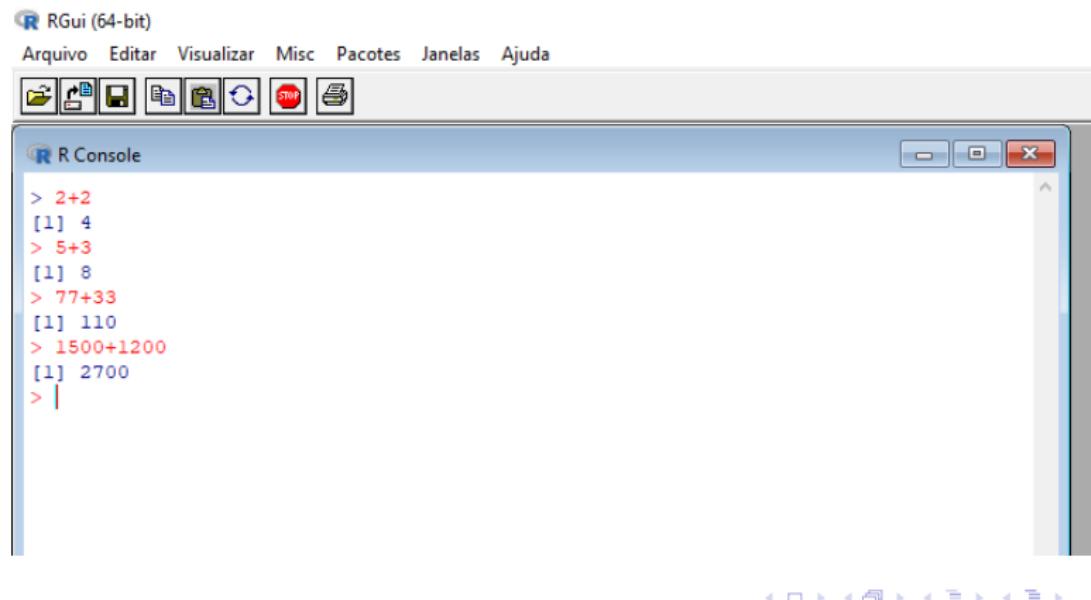


Vamos começar!



Adição

Começando com algumas adições simples.



The screenshot shows the RGui (64-bit) application window. At the top, there's a menu bar with 'Arquivo', 'Editar', 'Visualizar', 'Misc', 'Pacotes', 'Janelas', and 'Ajuda'. Below the menu is a toolbar with various icons. The main area is the 'R Console' window, which contains the following session history:

```
> 2+2
[1] 4
> 5+3
[1] 8
> 77+33
[1] 110
> 1500+1200
[1] 2700
> |
```

At the bottom of the window, there are standard window control buttons (minimize, maximize, close) and a set of small navigation icons.

Subtração

RGui (64-bit)

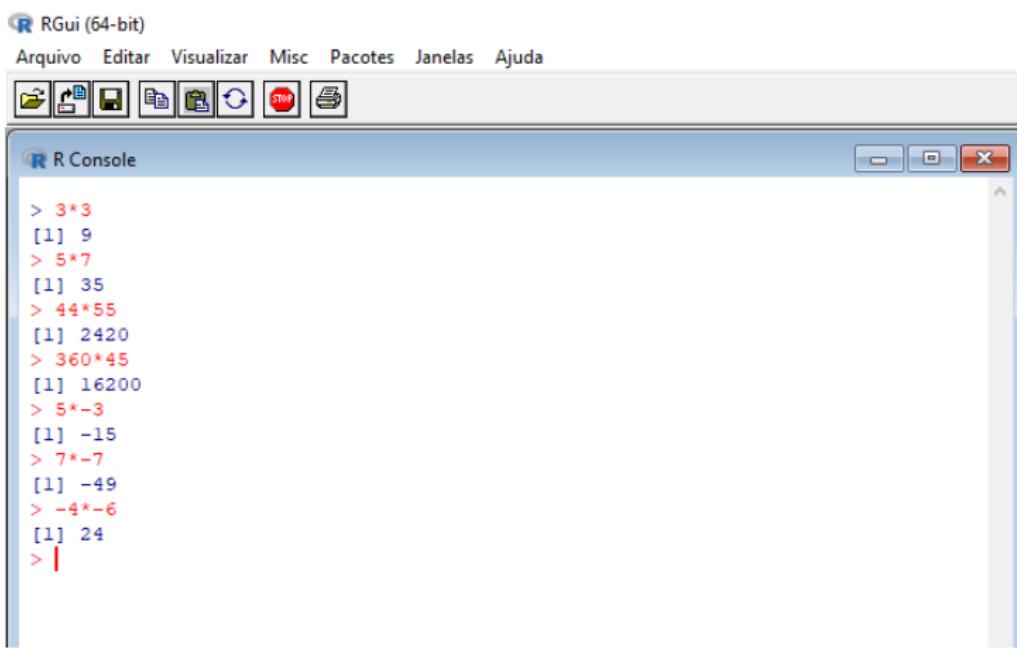
Arquivo Editar Visualizar Misc Pacotes Janelas Ajuda

The screenshot shows the RGui (64-bit) interface. At the top is a menu bar with 'Arquivo', 'Editar', 'Visualizar', 'Misc', 'Pacotes', 'Janelas', and 'Ajuda'. Below the menu is a toolbar with various icons. The main area is titled 'R Console' and contains the following R session history:

```
> 5-2
[1] 3
> 4-20
[1] -16
> 7600-1350
[1] 6250
> 3500-8000
[1] -4500
> |
```

At the bottom of the R console window, there is a scroll bar and a set of small navigation icons.

Multiplicação



The screenshot shows the RGui (64-bit) application window. At the top is a menu bar with 'Arquivo', 'Editar', 'Visualizar', 'Misc', 'Pacotes', 'Janelas', and 'Ajuda'. Below the menu is a toolbar with various icons. The main area is titled 'R Console' and contains the following R session history:

```
> 3*3
[1] 9
> 5*7
[1] 35
> 44*55
[1] 2420
> 360*45
[1] 16200
> 5^-3
[1] -15
> 7^-7
[1] -49
> -4^-6
[1] 24
> |
```

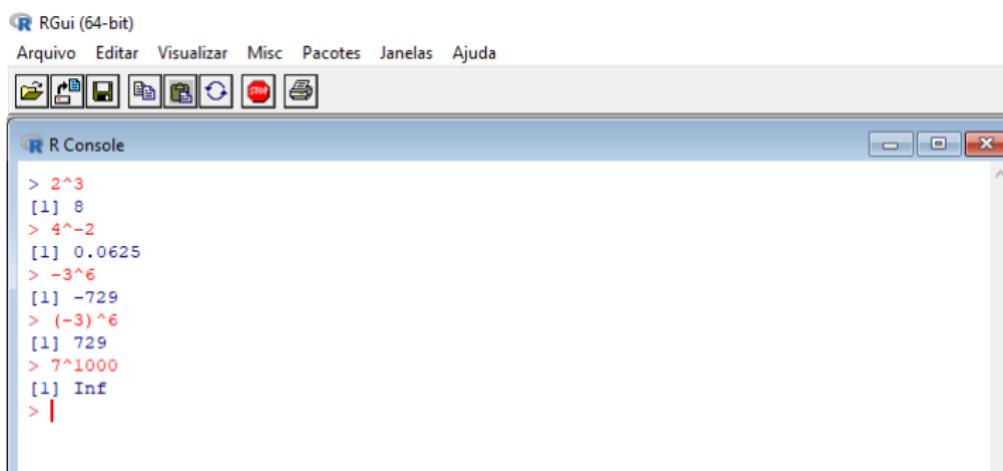
Divisão

The screenshot shows the RGui (64-bit) application window. At the top is a menu bar with 'Arquivo', 'Editar', 'Visualizar', 'Misc', 'Pacotes', 'Janelas', and 'Ajuda'. Below the menu is a toolbar with various icons. The main area is the 'R Console' window, which contains the following R session history:

```
> 10/5
[1] 2
> 4/20
[1] 0.2
> -6/10
[1] -0.6
> 8500/95400
[1] 0.08909853
> 8500/8
[1] 1062.5
> |
```

At the bottom of the window, there is a set of navigation icons.

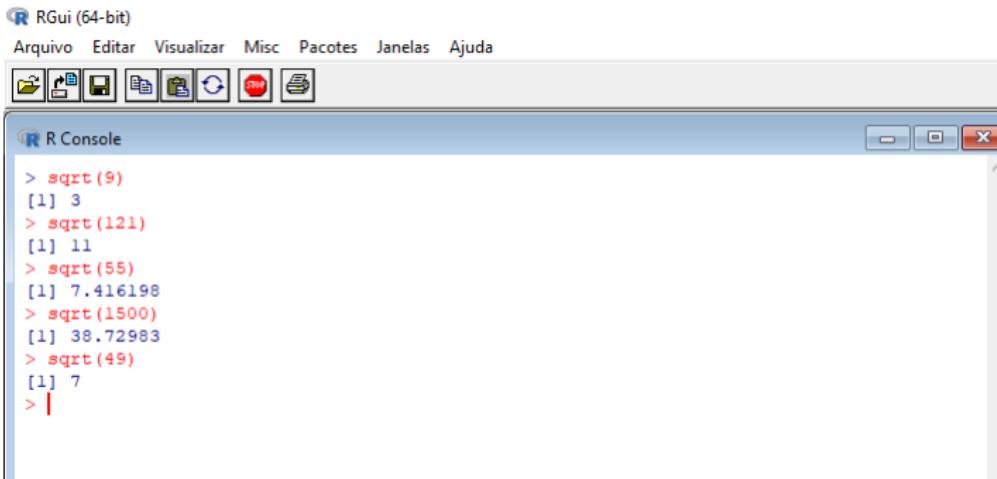
Potenciação



Observe que elevando um número a uma potência muito alta o R responde com “Inf” que é equivalente a infinito.

Raíz Quadrada

Para calcular raíz quadrada é preciso escrever "sqrt" e entre parênteses colocar o número que deseja calcular



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```
> sqrt(9)
[1] 3
> sqrt(121)
[1] 11
> sqrt(55)
[1] 7.416198
> sqrt(1500)
[1] 38.72983
> sqrt(49)
[1] 7
> |
```

Matriz no R

Como escrever essa Matriz no R?

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 0 & 4 & 6 \\ 0 & 5 & 0 \end{bmatrix}$$

O processo é um pouco mais complexo do que as operações vistas anteriormente.

Vamos criar a Matriz A.

- Primeiro escrevemos o comando “matrix”



The image shows a screenshot of an R console window. The title bar says "R Console". In the main area, there is a blue input field containing the text "> matrix()". Below the input field, there is a large white area representing the output pane where results would be displayed.

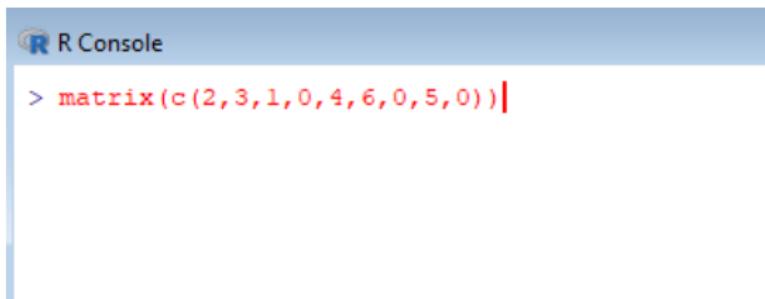
- Dentro dos parênteses colocamos “c()” que indica um vetor.



R Console

```
> matrix(c())|
```

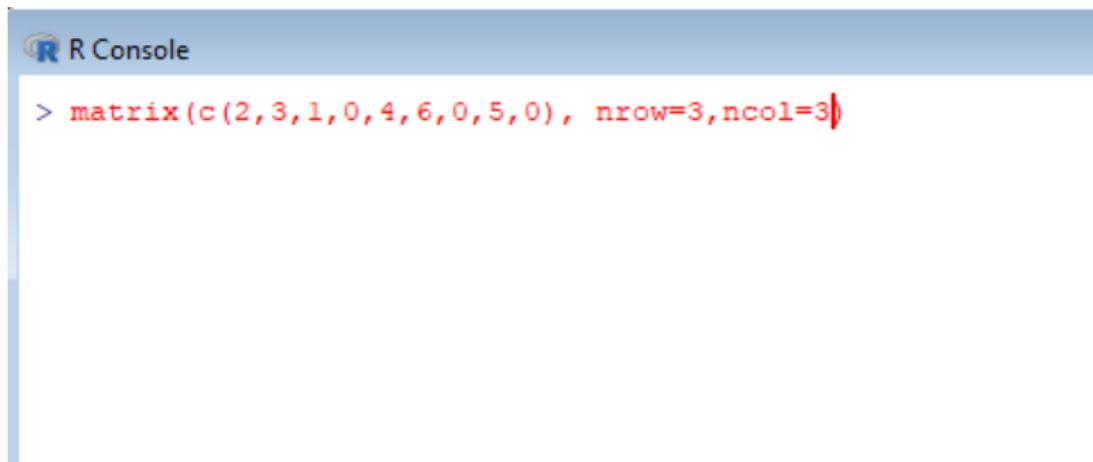
- E dentro dos parênteses desse vetor escrevemos os elementos da matriz



R Console

```
> matrix(c(2,3,1,0,4,6,0,5,0))|
```

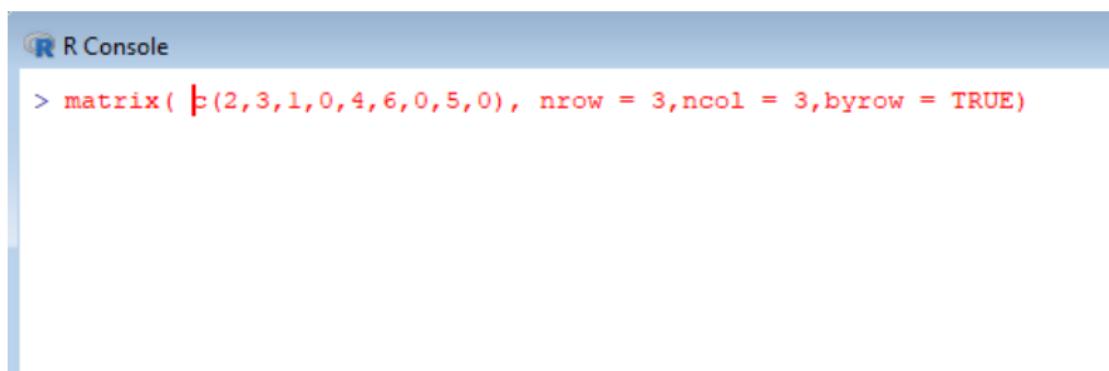
- Depois determinamos o número de linhas e colunas da Matriz, usando “nrow” e “ncol”.



R Console

```
> matrix(c(2,3,1,0,4,6,0,5,0), nrow=3, ncol=3)
```

- Por fim, colocamos “byrow= TRUE” para indicar que a matriz vai ser escrita na ordem em que está o vetor.



R Console

```
> matrix( |(2,3,1,0,4,6,0,5,0), nrow = 3,ncol = 3,byrow = TRUE)
```

E a Matriz está pronta.

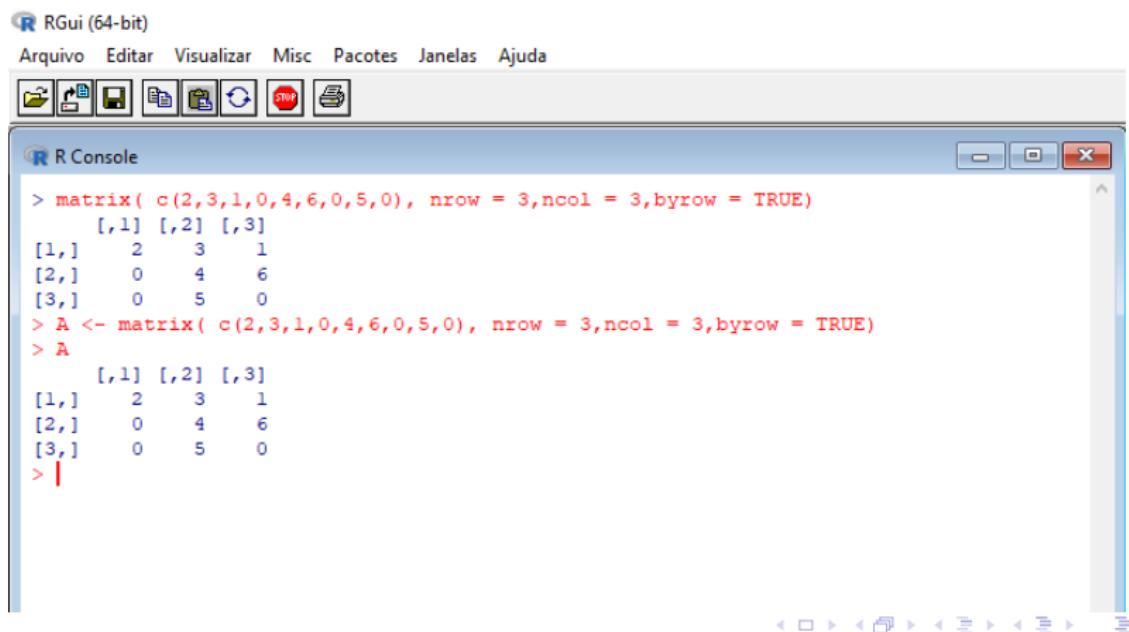
The screenshot shows the RGui (64-bit) application window. At the top is a menu bar with 'Arquivo', 'Editar', 'Visualizar', 'Misc', 'Pacotes', 'Janelas', and 'Ajuda'. Below the menu is a toolbar with various icons. The main area is titled 'R Console' and contains the following text:

```
> matrix( c(2,3,1,0,4,6,0,5,0), nrow = 3, ncol = 3, byrow = TRUE)
 [,1] [,2] [,3]
 [1,]    2    3    1
 [2,]    0    4    6
 [3,]    0    5    0
> |
```

At the bottom of the R Console window, there is a set of navigation icons: back, forward, search, and others.

Matriz A

Aqui definimos a matriz como "A".



The screenshot shows the RGui (64-bit) application window. At the top, there's a menu bar with 'Arquivo', 'Editar', 'Visualizar', 'Misc', 'Pacotes', 'Janelas', and 'Ajuda'. Below the menu is a toolbar with various icons. The main area is titled 'R Console' and contains the following R code:

```
> matrix( c(2,3,1,0,4,6,0,5,0), nrow = 3, ncol = 3, byrow = TRUE)
 [,1] [,2] [,3]
 [1,]    2    3    1
 [2,]    0    4    6
 [3,]    0    5    0
> A <- matrix( c(2,3,1,0,4,6,0,5,0), nrow = 3, ncol = 3, byrow = TRUE)
> A
 [,1] [,2] [,3]
 [1,]    2    3    1
 [2,]    0    4    6
 [3,]    0    5    0
> |
```

The console window has scroll bars on the right and bottom. At the bottom, there are navigation icons for the RGui interface.