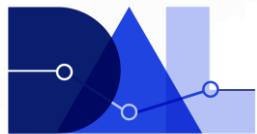




CEFET/RJ



Pacotes e ajuda



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Pacotes

- Pacotes são coleções de funções disponibilizados como bibliotecas
 - Publicados no repositório CRAN
 - Controle de qualidade
 - Boa documentação
 - Carregados de um repositório GitHub
 - Versões em desenvolvimento
- Atualmente têm mais de 18500 pacotes
 - <https://cran.r-project.org/>
- R tem uma comunidade muito ativa
 - Vários pesquisadores, professores, programadores e estatísticos
- Três pacotes são do Data Analytics Lab
 - <https://cran.r-project.org/web/packages/TSPred/index.html>
 - <https://cran.rstudio.com/web/packages/gstsm/index.html>
 - <https://cran.r-project.org/web/packages/STMotif/index.html>

Instalação de pacotes

```
#funções gráficas qplot  
?qplot
```

```
library(ggplot2)
```

```
?qplot
```

```
# deixei a instalação comentada, mas para rodar tire o comentário ...  
#install.packages("ggplot2")
```



Uso de função do pacote ggplot2

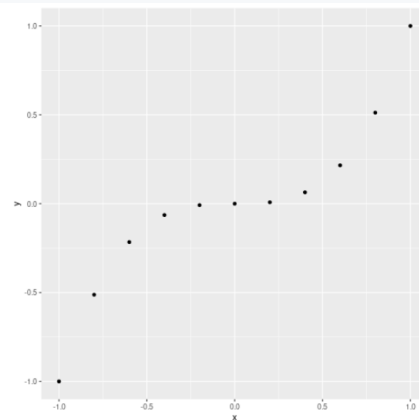
```
x <- c(-1, -0.8, -0.6, -0.4, -0.2, 0, 0.2, 0.4, 0.6, 0.8, 1)  
x
```

```
## [1] -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
```

```
y <- x^3  
y
```

```
## [1] -1.000 -0.512 -0.216 -0.064 -0.008  0.000  0.008  0.064  0.216  0.512  1.000
```

```
qplot(x, y)
```



Prototipando uma função

```
# criar uma função para jogada  
dado <- 1:6  
dados <- sample(dado, size = 2, replace = TRUE)  
sum(dados)
```



```
## [1] 8
```



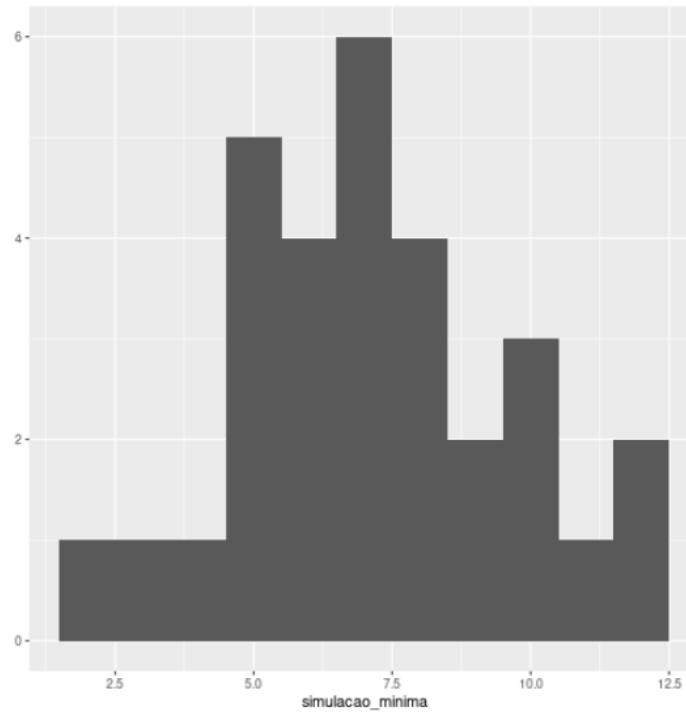
Prototipando uma função

```
jogada <- function() {  
  dado <- 1:6  
  dados <- sample(dado, size = 2, replace = TRUE)  
  return(sum(dados))  
}
```



Simulação "mínima"

```
simulacao_minima <- replicate(30, jogada())  
qplot(simulacao_minima, binwidth = 1)
```

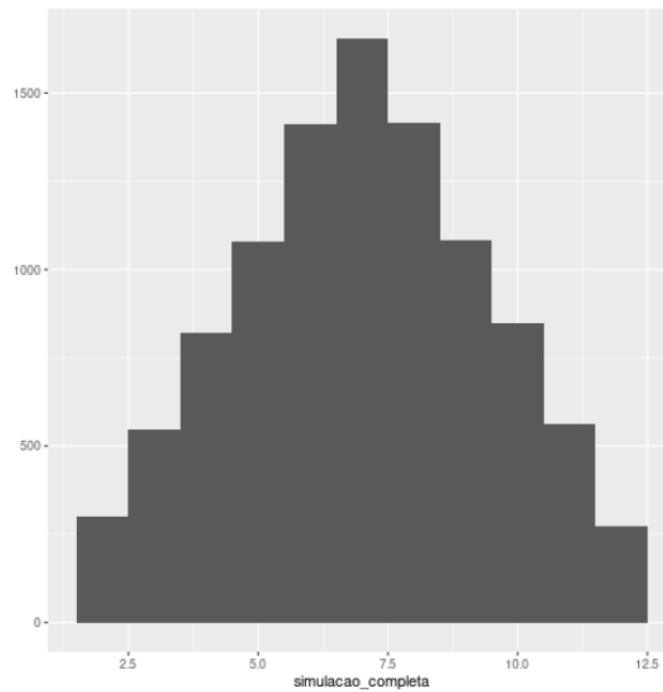


Espaço de possibilidades

combinations of die 1 and die 2 that add up to sum					(6,1)						
					(5,1)	(5,2)	(6,2)				
				(4,1)	(4,2)	(4,3)	(5,3)	(6,3)			
			(3,1)	(3,2)	(3,3)	(3,4)	(4,4)	(5,4)	(6,4)		
		(2,1)	(2,2)	(2,3)	(2,4)	(2,5)	(3,5)	(4,5)	(5,5)	(6,5)	
	(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)	(2,6)	(3,6)	(4,6)	(5,6)	(6,6)
	2	3	4	5	6	7	8	9	10	11	12
	sum										

Simulação "completa"

```
simulacao_completa <- replicate(10000, jogada())  
qplot(simulacao_completa, binwidth = 1)
```



Ajuda para raiz quadrada

MathFun {base}

R Documentation

Miscellaneous Mathematical Functions

Description

`abs(x)` computes the absolute value of `x`, `sqrt(x)` computes the (principal) square root of `x`, \sqrt{x} .

The naming follows the standard for computer languages such as C or Fortran.

Usage

```
abs(x)
sqrt(x)
```

Arguments

`x` a numeric or [complex](#) vector or array.

Details

These are [internal generic primitive](#) functions: methods can be defined for them individually or via the [Math](#) group generic. For complex arguments (and the default method), `z`, `abs(z) == Mod(z)` and `sqrt(z) == z^0.5`.

`abs(x)` returns an [integer](#) vector when `x` is integer or [logical](#).

S4 methods

Both are S4 generic and members of the [Math](#) group generic.

References

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole.

See Also

[Arithmetic](#) for simple, [log](#) for logarithmic, [sin](#) for trigonometric, and [Special](#) special mathematical functions.

'[plotmath](#)' for the use of `sqrt` in plot annotation.

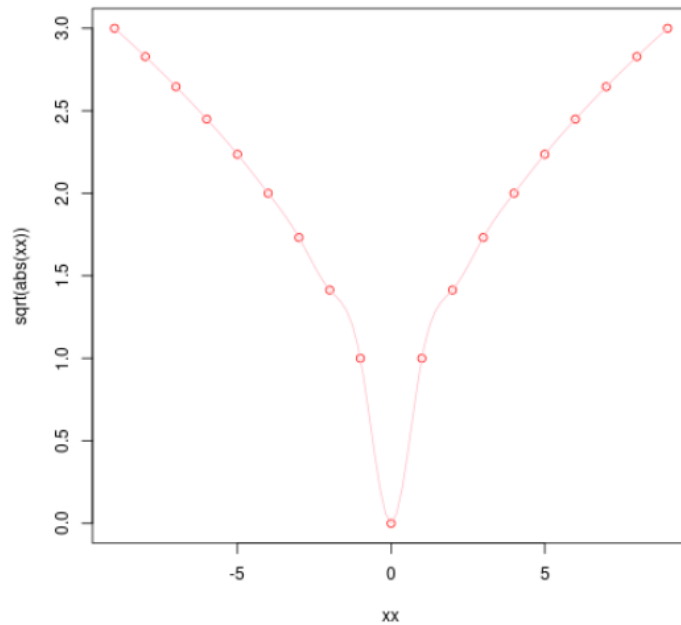
Examples

[Run examples](#)

```
require(stats) # for spline
require(graphics)
xx <- -9:9
plot(xx, sqrt(abs(xx)), col = "red")
lines(spline(xx, sqrt(abs(xx)), n=101), col = "pink")
```

Usando o código da ajuda

```
#slide 11
require(stats) # for spline
require(graphics)
xx <- -9:9
plot(xx, sqrt(abs(xx)), col = "red")
lines(spline(xx, sqrt(abs(xx)), n=101), col = "pink")
```



Ajuda para amostra

?sample



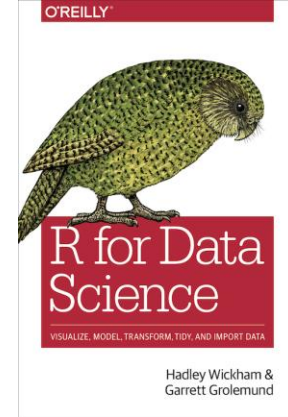
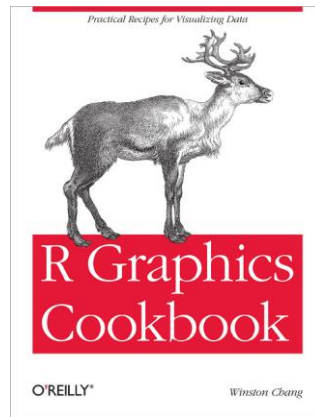
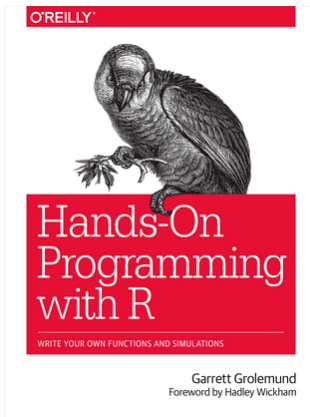
Versão da amostragem com distribuição de probabilidades

```
simulacao = replicate(10000,  
                      sample(2:12,  
                             replace=TRUE,  
                             prob=c(1,2,3,4,5,6,5,4,3,2,1)/36))  
qplot(simulacao, binwidth=1)
```



Referências

Material: <https://eic.cefet-rj.br/~eogasawara/tutorial-r>



Hands-on Programming with R: <https://rstudio-education.github.io/hopr/index.html>

R Graphics Cookbook: <https://r-graphics.org>

R Packages: <https://r-pkgs.org/index.html>

R for Data Science: <https://r4ds.had.co.nz>

<https://rstudio-education.github.io/hopr/basics.html>