



CEFET/RJ



Estrutura de repetição



Eduardo Ogasawara

eduardo.ogasawara@cefet-rj.br

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

Exemplo

```
weight <- 60  
height = 1.75  
subject <- "A"  
healthy <- TRUE  
bmi <- weight/height^2  
bmi
```



```
## [1] 19.59184
```



Exemplo

```
weight <- c(60, 72, 57, 90, 95, 72)
height <- c(1.75, 1.80, 1.65, 1.90, 1.74, 1.91)
subject <- c("A", "B", "C", "D", "E", "F")
```



Estrutura de repetição for

```
bmi <- 0
for (i in 1:length(weight)) {
  bmi[i] <- weight[i]/height[i]^2
}
bmi
```

```
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```

Inspeccionando os cálculos

```
bmi <- 0
for (i in 1:length(weight)) {
  bmi[i] <- weight[i]/height[i]^2
  print(bmi)
}
```



```
## [1] 19.59184
## [1] 19.59184 22.22222
## [1] 19.59184 22.22222 20.93664
## [1] 19.59184 22.22222 20.93664 24.93075
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```



```
bmi
```



```
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```



Depurando estrutura de repetição for

The screenshot shows the RStudio interface with a script file named `aula6.R` open. The script contains the following code:

```
1 weight <- c(60, 72, 57, 90, 95, 72)
2 height <- c(1.75, 1.80, 1.65, 1.90, 1.74, 1.91)
3
4 bmi <- 0
5 for (i in 1:length(weight)) {
6   bmi[i] <- weight[i]/height[i]^2
7   print(bmi)
8 }
```

The script is being executed, and the console shows the following output:

```
debug em ~/aula6.R#6: .doTrace(browser())
Browse[1]> n
Browse[1]> n
debug em ~/aula6.R#6: bmi[i] <- weight[i]/height[i]^2
Browse[1]> n
```

The Environment pane on the right shows the following variables:

Variable	Value
bmi	num [1:3] 19.6 2...
height	num [1:6] 1.75 1...
i	4L
weight	num [1:6] 60 72 ...

The Traceback pane shows the following error message:

```
[Debug source] at aula...
```

Removendo variáveis

```
rm(bmi)  
exists("bmi")
```



```
## [1] FALSE
```



Estrutura de repetição while

```
i <- 1
bmi <- 0
while (i <= length(weight)) {
  bmi[i] <- weight[i]/height[i]^2
  i <- i + 1
}
```



Inspecionando estrutura de repetição while

```
i <- 1
bmi <- 0
while (i <= length(weight)) {
  bmi[i] <- weight[i]/height[i]^2
  i <- i + 1
}
```



Depurando estrutura de repetição while

```
i <- 1
bmi <- 0
while (i <= length(weight)) {
  bmi[i] <- weight[i]/height[i]^2
  i <- i + 1
}
```



Encapsulando cálculo do bmi como função

```
compute_bmi <- function(weight, height) {  
  i <- 1  
  bmi <- 0  
  while (i <= length(weight)) {  
    bmi[i] <- weight[i]/height[i]^2  
    i <- i + 1  
  }  
  return(bmi)  
}  
  
bmi <- compute_bmi(weight, height)  
bmi
```

```
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```

Implementando a função do jeito certo

```
compute_bmi <- function(weight, height) {  
  resposta <- weight/height^2  
  return(resposta)  
}
```



```
bmi <- compute_bmi(weight, height)  
bmi
```

```
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```



Depurando a função

```
compute_bmi <- function(weight, height) {  
  resposta <- weight/height^2  
  return(resposta)  
}
```

```
bmi <- compute_bmi(weight, height)  
bmi
```

```
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```

Uso da função (escalares/vetores)

```
compute_bmi(80, 1.79)
```



```
## [1] 24.96801
```



```
compute_bmi(weight, height)
```

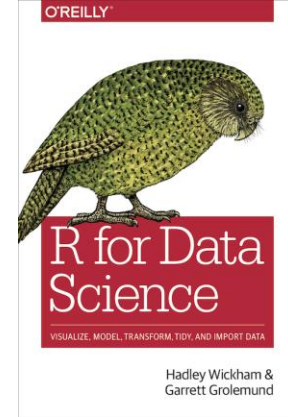
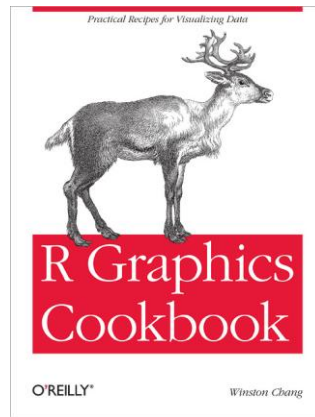
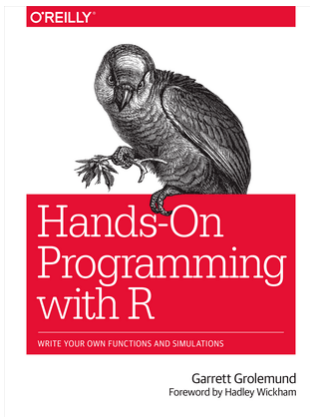


```
## [1] 19.59184 22.22222 20.93664 24.93075 31.37799 19.73630
```



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>