

Creating your own functions in R

For those who do not know how.

Source: Chew C.H. (2020) A.I., Analytics & Data Science, Vol. 1, Appendix B.

Ability to do bootstrap for any statistics

- If you can create your own functions in R, your ability to do bootstrap is only limited by your imagination.
- Otherwise, you are limited to:
 - Functions created by someone else, and
 - That you know of, and
 - Suitable for the problem you are solving.

Importance of Functions in R

“To understand computations in R, two slogans are helpful:
Everything that exists is an object.
Everything that happens is a function call.”

John Chambers

Creator of the S programming language,

Core member of the R programming language project.

Adjunct Professor of Statistics, Stanford University.

Example: `mean()` function

- At R console, `?mean` to view documentation from mean function creator. Shows definition of the function and examples on usage.

Arithmetic Mean

Description

Generic function for the (trimmed) arithmetic mean.

Usage

```
mean(x, ...)
```

```
## Default S3 method:
```

```
mean(x, trim = 0, na.rm = FALSE, ...)
```

Arguments

x An R object. Currently there are methods for numeric/logical vectors and [date](#), [date-time](#) and [time interval](#) objects. Complex vectors are allowed for `trim = 0`, only.

trim the fraction (0 to 0.5) of observations to be trimmed from each end of `x` before the mean is computed. Values of `trim` outside that range are taken as the nearest endpoint.

na.rm a logical value indicating whether NA values should be stripped before the computation proceeds.

... further arguments passed to or from other methods.

User Defined Functions

- Anyone can create functions in R.
- This is my sum3() function defined mathematically:

$$\text{sum3}(x, y, z = 1) = x + 2y + z$$

Note: X and Y are mandatory arguments, Z is optional with a default value.

- $\text{sum3}(1, 2) =$
- $\text{sum3}(2, 1) =$
- $\text{sum3}(y = 2, x = 1) =$
- $\text{sum3}(1, 2, -1) =$
- $\text{sum3}(1) =$

Learning Activity 2: Create your R function

Est. Duration: 10 mins

- Create the `sum3()` function in R.
- *Hint:*
<https://www.statmethods.net/management/userfunctions.html>
- Verify your answers using the numerical examples in previous slide.

Solution: my sum3() function created in R

PAUSE The Video and Try to Solve it Before Looking at One Answer

Solution: my sum3() function created in R

```
Console Terminal x
D:/Dropbox/Datasets/ADA1/2_Fundamentals/ ↗
> sum3 <- function(x, y, z = 1) {
  ans = x + 2*y + z
  return(ans)
}
```

After running the sum3 function, it will also be shown in the Environment Panel.

```
Console Terminal x
D:/Dropbox/Datasets/ADA1/2_Fundamentals/ ↗
> sum3(1, 2)
[1] 6
> sum3(2, 1)
[1] 5
> sum3(y = 2, x = 1)
[1] 6
> sum3(1, 2, -1)
[1] 4
> sum3(1)
Error in sum3(1) : argument "y" is missing, with no default
```