

Lesson 4: Quick Review

Define a Function in R - Using R function

Syntax:

```
functionName <- function(parameter1, parameter2, ... ) {  
    R expressions  
    return( an R-expression )  
}
```

Reading: given inputs *parameter1* and *parameter2* etc., the output of *functionName*(*parameter1*, *parameter2*, ...) is the value of *R-expression*.

Specify the intentional form of a function

Example. Write an R function to define the *naive deviation function*.

To write an R function

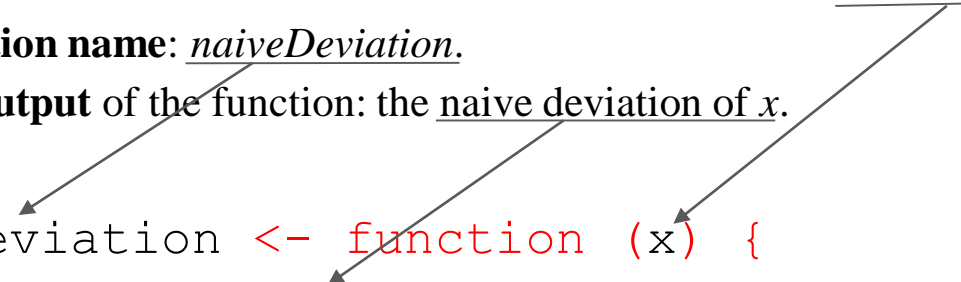
- Decide **inputs/parameters** naive deviation function has:
x: a statistics variable (represented as named vector in R).
- Decide the **function name** (which can be any, but a good name is preferred):
naiveDeviation.
- Decide the **output** of the function (from the question)
the *naive deviation* of *x*.

Defining a Function in R - Using R function

```
functionName <- function(parameter1, parameter2, ... ){  
    R expressions  
    return( an R xpression )  
}
```

- **Parameters** *naive deviation* function has: a statistics variable x (a named vector)
- **Function name:** *naiveDeviation*.
- The **output** of the function: the naive deviation of x .

```
naiveDeviation <- function (x) {  
    return(x - mean(x)) # the output is x - mean(x)  
}
```



2. Review of Representing a Set Using R

Practice. Recall we have cars with variable speed, we would like to know the number of cars with speed 205. The id and speed of the cars:

#1	#3	#11	#48
215	200	205	205

- Goal: recall R functions and their evaluation.
- Go to repl.it
- Run R console
- Click link: <https://replit.com/@yuanlinzhangTTU/L4-Review#L4-review.r>
- Click the file `L4-review.r`
- Click the “code”
- Read through every line of the code in `L4-review.r`. Copy and paste each line here to your R console and observe the R console output

2. Review of Representing a Set Using R

```
> #T1 Statistics variable speed of cars is represented as a named vector.  
> # Associate the vector to a variable  
> speed <- c("#1"= 215, "#3" = 200, "#11" = 205, "#48" = 205)  
>  
> #T2 show speed  
> speed  
#1 #3 #11 #48  
215 200 205 205  
>  
> #T3 the logical vector indicating cars with speed of 205  
> speed == 205  
#1 #3 #11 #48  
FALSE FALSE TRUE TRUE  
>  
> #T4 use "which" function to output cars whose value is true in the logical vec  
> cars205 <- which(speed == 205)  
>  
> #T5 get all names  
> names(cars205)  
[1] "#11" "#48"  
>  
> #T6 get the number of names  
> length(names(cars205))  
[1] 2  
>  
> #T7 We can put things together (not recommended though)  
> length(names(which(speed == 205)))  
[1] 2
```