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
>
ctorT5 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
```