Class 6

R – Functions and stringr package

Functions

- Set of organized statement to perform a specific task.
- Used to reduce code complexity and repeating the task operation.
- Two types of functions:-

  In-built functions

  User defined functions

Function components

- Function Name – Actual name of the function. This name has been stored in the environment
- Argument – Passing values. It’s optional
- Function body – Collection of statements to perform a task
- Return Value – Last expression in the function body which is to be evaluated.

User defined Functions

- R allows the users to create function for their own requirement
- Keyword function defines the starting of R function.
- Next parentheses after the function keyword is the front gate of the function.
- There user can provide the arguments.

Example (User defined function)

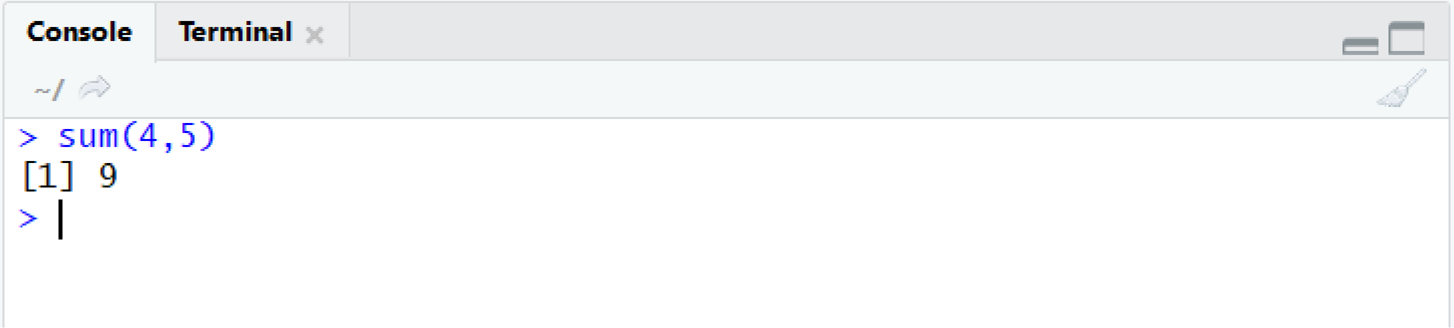
```
>       add <- function(a,b){
                new1 <- a+b
                print(new1)
        }

>       add(4,5)
```

Built-in Functions

- Already created functions in the packages
- R has enormous number of functions
- These are directly called by the user
- Ex. mean() in base package

Example (Built in function)

> sum(4,5)

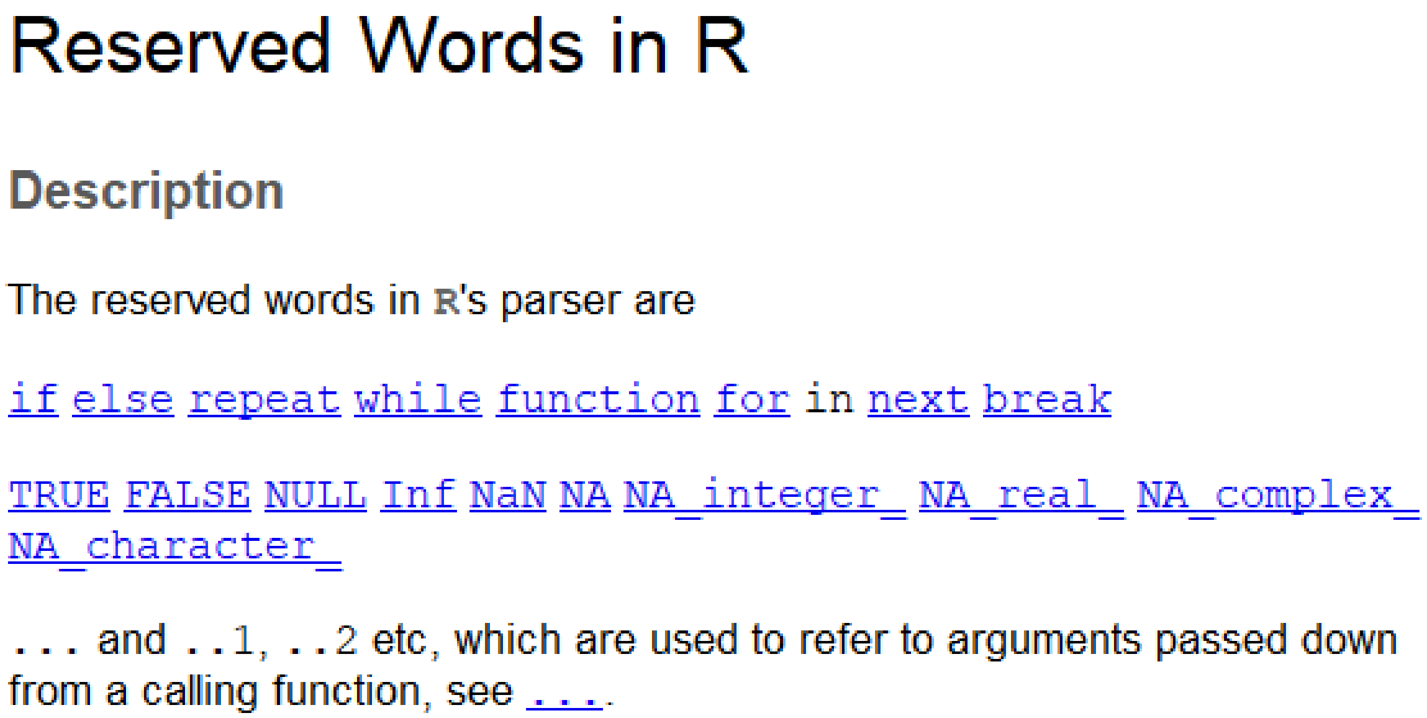


```
> sum(4,5)
[1] 9
> 
```

Keyword

- It’s a word reserved by a program language.
- R also having set of keywords like other programming language like C, C++, java, etc.
- Keyword can’t be used as a variable name.
- ?reserved or help(reserved) used to identify the keywords.

Keyword



Reserved Words in R

Description

The reserved words in R's parser are

`if` `else` `repeat` `while` `function` `for` `in` `next` `break`

`TRUE` `FALSE` `NULL` `Inf` `NaN` `NA` `NA_integer_` `NA_real_` `NA_complex_` `NA_character_`

`...` and `..1`, `..2` etc, which are used to refer to arguments passed down from a calling function, see `...`.

String

Collection of characters and stored in single dimension

Values written inside of single or double quotes. That will be considered as a string

R stores every string within the double quotes, even user created with single quotes.

Example

```
> myseq <- 'ATCGTATCGTATTGACGTAGTACGTA'
> print(myseq)
        [1] "ATCGTATCGTATTGACGTAGTACGTA"
> myseq_1 <- "AGTGATGCTATAGACTGATAGCTAGATCGA"
> print(myseq_1)
        [1] "AGTGATGCTATAGACTGATAGCTAGATCGA"
> myseq_2 <- 'ATGATGCTAGTA"GCTA"GCAT'
> print(myseq_2)
        [1] "ATGATGCTAGTA\"GCTA\"GCAT"
> myseq_3 <- "AGTAGATAGTA'GAT'AGTAG"
> print(myseq_3)
        [1] "AGTAGATAGTA'GAT'AGTAG"
```

Example (Invalid Strings)

```
>myseq_1 <-
'ATCGTATCGTATTGACGTAGTACGTA"
```

```
>myseq_2 <-
'ATCGTATCGTATTG'ACGTAGTACGTA'
```

```
>myseq_3 <-
"ATCGTATCGTATTG"ACGTAGTACGTA"
```

String manipulation

String concatenation

- Concatenating/Combining multiple strings
- paste() function used to concatenate n number of strings.
- Basic syntax:-

```
paste (..., sep = " ")
```

Example

```
> myseq <- "ATGC"
> print(myseq)
        [1] "ATGC"
> myseq_1 <- "TTTT"
> print(myseq_1)
        [1] "TTTT"
> myseq_2 <- "CCCC"
> print(myseq_2)
        [1] "CCCC"
> myseq_3 <- paste(myseq,myseq_1,myseq_2,sep="")
> print(myseq_3)
        [1] "ATGCTTTTCCCC"
> myseq_3 <- paste(myseq,myseq_1,myseq_2,sep="-")
> print(myseq_3)
        [1] "ATGC-TTTT-CCCC"
```

String Count

- Counts number of characters in the string
- nchar() function used to count character in the string.
- Basic syntax:-

```
nchar()
```

Example

```
> myseq <- "ATGC"
> nchar(myseq)
     [1] 4
```

String Changing Case

- Change the case of the strings
- toupper() and tolower function used for changing cases in the string.
- Basic syntax:-

```
toupper()

tolower()
```

Example

```
>myseq <- "ATGC"
>low_myseq <-
tolower(myseq)
>print(low_myseq)
     [1] atgc
>toupper(low_myseq)
     [1] ATGC
```

String Extracting parts

- Extracting parts from the string
- substr() function used for extracting parts from the string.
- Basic syntax:-

```
substr(..,from,to)
```

Example

```
>myseq <- "ATGC"
>ext_myseq <-
substr(myseq,3,4)
>print(ext_myseq)
     [1] “GC”
```

Package - stringr

- Simple, Consistent Wrappers for Common String Operations
- Part of tidyverse package

```
install.packages(“stringr”)

library(stringr)
```